VIRUDHUNAGAR HINDU NADARS' SENTHIKUMARA NADAR COLLEGE

(An Autonomous Institution Affiliated to Madurai Kamaraj University)

(Re – accredited with 'A' Grade by NAAC)

VIRUDHUNAGAR

23.03.2013

MINUTES OF THE FOURTH ACADEMIC COUNCIL MEETING

The fourth Academic Council Meeting of Virudhunagar Hindu Nadars' Senthikumara Nadar College (Autonomous) Virudhunagar was held on 23rd March, 2013 at 11.00 a.m. in V.P.S.A.Paramasiva Nadar – Thillai Sivakami Ammal Conference Hall.

The Chairperson and Principal welcomed the gathering

The Chairperson also introduced Thiru T. Durai Anand, Chairperson of Boards of Studies of B.Sc. M.Sc. and M.Phil. Microbiology to the council who was inducted as a new member of the Academic Council.

Seven subjects were presented for resolution

Dr. S. Jeyaram, Chairperson, Boards of Studies of Part I Tamil and B.A. Tamil moved the subject 1(i)

Subject 1 (i):

Approval for the second year syllabi for Part I Tamil and B.A. Tamil passed in the Boards of Studies meetings held on 18.1.2013 as given in Annexure I (p.762 - 779).

Resolution

The subject was considered and resolved to approve the second year detailed syllabi for Part I Tamil and B.A. Tamil passed in their respective boards.

Dr. K. Sridhar, Chairperson, Board of Studies of M.A. Tamil moved the subject 1(ii)

Subject 1 (ii):

Approval for the second year syllabus for M.A. Tamil passed in the Board of Studies meeting held on 18.1.2013 as given in Annexure I (p.780-798).

Resolution

The subject was considered and resolved to approve the second year detailed syllabus for M.A. Tamil passed in its board.

Dr. A. Mohankumar, Chairperson, Boards of Studies of Part – II English, B.A. English, and M.A. English moved the subject 1(iii)

Subject 1(iii):

Approval for the changes in the titles of the subjects for B.A. English and M.A. English and the detailed syllabi for second year Part II, B.A. English and M.A. English passed in their respective Boards of Studies meetings as given in Annexure I (p.799-820).

Resolution

The subject was considered and resolved to approve the changes made in the titles of the subject for B.A. English and M.A. English and also the second year detailed syllabi for Part II English, B.A. English and M.A. English passed in their respective boards.

Dr. G. Ravi, Chairperson, Boards of Studies of B.A. History and M.A. History moved the subject 1 (iv)

Subject 1(iv):

Approval for the changes in the titles of the subjects for B.A. History and M.A. History and the detailed syllabi for second year B.A. History and M.A. History passed in their respective boards in the meeting held on 18.1.2013 as given in Annexure I (p.842-858).

Resolution

The subject was considered and resolved to approve the changes made in the titles of the subject for B.A. History and M.A. History and also the second year detailed syllabi for B.A. History and M.A. History passed in their respective boards.

Dr. E. Narayanan Nadar, Chairperson, Board of Studies of B.A. Economics and M.A. Economics moved the subject 1(v)

Subject 1(v):

Approval for the changes in the titles of the subjects for B.A. Economics and M.A. Economics and the detailed syllabi for second year B.A. Economics and M.A. Economics passed in their respective boards in the meeting held on 18.1.2013 as given in Annexure I (p.821-841).

Resolution

The subject was considered and resolved to approve the changes made in the titles of the subject for B.A. Economics and M.A. Economics and also the second year detailed syllabi for B.A. Economics and M.A. Economics passed in their respective boards.

Dr. M. Sakthivel, Chairperson, Boards of Studies of B.Com., B.Com. with CA, M.Com. and Diploma in Computerized Accounting and Office Automation moved the subject 1(vi)

Subject 1 (vi):

Approval for the second year syllabus for B.Com. B.Com. with CA, M.Com. and Diploma in Computerized Accounting and Office Automation passed in their respective Boards of Studies meetings as given in Annexure I (p.859-896).

Resolution

The subject was considered and resolved to approve the second year detailed syllabus for B.Com. B.Com. with CA, M.Com. and Diploma in Computerized Accounting and Office Automation passed in their respective boards.

Thiru M. Kumar, Chairperson, Board of Studies of B.B.A. moved the subject 1(vii)

Subject 1 (vii):

Approval for the second year syllabus for B.B.A passed in the Board of Studies meeting held on 18.1.2013 as given in Annexure I (p.920-932).

Resolution

The subject was considered and resolved to approve the second year detailed syllabus for B.B.A. passed in its board.

Thiru S. Muthuraj, Chairperson, Boards of Studies of B.Sc. Maths, B.Sc. Maths with CA, and M.Sc. Maths, moved the subject 1(viii)

Subject 1(viii):

Approval for the changes in the titles of the subjects for B.Sc. Maths with CA and the detailed syllabi for second year B.Sc. Maths, B.Sc. Maths with CA, and M.Sc. Maths passed in their respective Boards of Studies meetings as given in Annexure I (p.997-1022).

Resolution

The subject was considered and resolved to approve the changes made in the titles of the subject for B.Sc. Maths with CA and also the second year detailed syllabi for B.Sc. Maths, B.Sc. Maths with CA, and M.Sc. Maths passed in their respective boards.

Thiru S. Rajasingh, Chairperson, Boards of Studies of B.Sc. Physics, M.Sc. Physics, and Diploma and Advanced Diploma Course in Renewable Energy moved the subject 1(ix)

Subject 1(ix):

Approval for the changes in the titles of the subjects for M.Sc. Physics and the detailed syllabi for second year B.Sc. Physics, M.Sc. Physics, and Diploma and Advanced Diploma Course in Renewable Energy passed in their respective Boards of Studies meetings as given in Annexure I (p.1023-1044).

Resolution

The subject was considered and resolved to approve the changes made in the titles of the subject for M.Sc. Physics and also the second year detailed syllabi for B.Sc. Physics, M.Sc. Physics, and Diploma and Advanced Diploma Course in Renewable Energy passed in their respective boards.

Dr. R. Boominathan, Chairperson, Boards of Studies of B.Sc. Chemistry and M.Sc. Chemistry moved the subject 1(x)

Subject 1(x):

Approval for the second year syllabi for B.Sc. Chemistry and M.Sc. Chemistry passed in the Boards of Studies meetings held on 18.1.2013 as given in Annexure I (p.1045-1071).

Resolution

The subject was considered and resolved to approve the second year detailed syllabi for B.Sc. Chemistry and M.Sc. Chemistry passed in their respective boards.

Dr. A. Rajendran, Chairperson, Boards of Studies of B.Sc. Botany and M.Sc. Botany moved the subject 1(xi)

Subject 1(xi):

Approval for the second year syllabi for B.Sc. Botany and M.Sc. Botany passed in the Boards of Studies meetings held on 18.1.2013 as given in Annexure I (p.1072-1091).

Resolution

The subject was considered and resolved to approve the second year detailed syllabi for B.Sc. Botany and M.Sc. Botany passed in their respective boards.

Thiru V. Shanmugavelu, Chairperson, Boards of Studies of B.Sc. Zoology and M.Sc. Zoology moved the subject 1(xii)

Subject 1(xii):

Approval for the changes in the titles of the subjects for M.Sc. Zoology and the detailed syllabi for second year B.Sc. Zoology and M.Sc. Zoology passed in their respective boards in the meeting held on 18.1.2013 as given in Annexure I (p.1092-1116).

Resolution

The subject was considered and resolved to approve the changes made in the titles of the subject for M.Sc. Zoology and also the second year detailed syllabi for B.Sc. Zoology and M.Sc. Zoology passed in their respective boards.

Dr. T. Kathirvalavakumar, Chairperson, Boards of Studies of B.Sc. Computer Science, M.Sc. Computer Science, and M.Phil. Computer Science moved the subject 1(xiii)

Subject 1(xiii):

Approval for the changes in the curriculum content of the subject *Artificial Neural Networks* for M.Phil. Computer Science and the detailed syllabi for second year B.Sc. Computer Science and M.Sc. Computer Science passed in their respective boards in the meetings held on 23.1.2013 as given in Annexure I (p.1117-1135).

Resolution

The subject was considered and resolved to approve the changes made in the curriculum content of the subject *Artificial Neural Networks* for M.Phil. Computer Science and also the second year detailed syllabi for B.Sc. Computer Science and M.Sc. Computer Science passed in their respective boards.

Thiru.T.Durai Anand, Chairperson, Boards of Studies of B.Sc. Microbiology, and M.Sc. Microbiology moved the subject 1(xiv)

Subject 1(xiv):

Approval for the second year syllabi for B.Sc. Microbiology, and M.Sc. Microbiology passed in the Boards of Studies meetings held on 18.1.2013 as given in Annexure I (p.1191-1207).

Resolution

The subject was considered and resolved to approve the second year detailed syllabi for B.Sc. Microbiology, and M.Sc. Microbiology passed in their respective boards.

Thiru D. Rajkumar, Chairperson, Boards of Studies of BCA, and MCA moved the subject 1(xv)

Subject 1(xv):

Approval for the second year syllabi for BCA, and MCA passed in the Boards of Studies meetings held on 18.1.2013 as given in Annexure I (p.1156-1190).

Resolution

The subject was considered and resolved to approve the second year detailed syllabi for BCA, and MCA passed in their respective boards.

Dr. T. Kathirvalavakumar, Co-ordinator of B.Sc. IT and M.Sc. CS&IT moved the subject 1(xvi)

Subject 1(xvi):

Approval for the changes in the titles of the subjects for M.Sc. CS&IT and the detailed syllabi for second year B.Sc. IT and M.Sc. CS&IT passed in their respective boards in the meeting held on 23.1.2013 as given in Annexure I (p.1136-1155).

Resolution

The subject was considered and resolved to approve the changes made in the titles of the subject for M.Sc. CS&IT and also the second year detailed syllabi for B.Sc. IT and M.Sc. CS&IT passed in their respective boards.

Dr. T. Arulvelan, Chairperson, Boards of Studies of MBA & M.Sc. (IT & M) moved the subject 1(xvii)

Subject 1(xvii):

Approval for the changes in the titles of the subjects for MBA & M.Sc. (IT & M) and the detailed syllabi for second year MBA & M.Sc. (IT & M) passed in their respective boards in the meetings held on 23.1.2013 as given in Annexure I (p.920-996).

Resolution

The subject was considered and resolved to approve the changes made in the titles of the subjects for MBA & M.Sc. (IT & M) and also the second year detailed syllabi for MBA & M.Sc. (IT & M) passed in their respective boards.

Dr. C. Chelladurai, Chairperson, Board of Studies of B.Com (E-Commerce) and M.Com with CA moved the subject 1(xviii)

Subject 1(xviii)

Approval for the replacement of a subject with a new one in the first semester of B.Com. (E-Commerce) and changes in the titles of the subjects for M.Com with CA and the detailed syllabi for second year B.Com. (E-Commerce) and M.Com with CA passed in their respective boards in the meetings held on 23.1.2013 as given in Annexure I (p.897-919).

Resolution

The subject was considered and resolved to approve the replacement of "tzpff; fbjq;fs"; with "nrayh; gzpKiw" for B.Com. (E-Commerce) and the changes made in the titles of the subjects for M.Com. with CA and also the second year detailed syllabi for B.Com. (E-Commerce) and M.Com. with CA passed in their respective boards.

Tmty. T. Sasikala, Chairperson, Board of Studies of Part – I Alternative language - Hindi moved the subject 1(xix)

Subject 1(xix):

Approval for the second year syllabi for Part – I Alternative language - Hindi passed in the Boards of Studies meetings held on 23.1.2013 as given in Annexure I (p.1208-1210).

Resolution

The subject was considered and resolved to approve the second year detailed syllabi for Part – I Alternative language - Hindi passed in their respective boards.

Dr. R.Selvam, Dean - Arts moved the second subject

Subject 2:

Approval for introducing self learning courses to secure extra credits.

Resolution

The subject was considered and resolved to approve the introduction of self learning courses only to fast learness.

Dr. N. Prithivikumaran, Dean - Research moved the third subject

Subject 3:

Approval for giving photocopy of answer scripts with evaluation sheet to ensure transparency.

Resolution

The subject was considered and resolved to approve the provision of giving photocopy of answer scripts with evaluation sheet to the candidates on demand to ensure transparency.

Dr.A.Sarathi, Dean - Internal moved the fourth subject

Subject 4:

Approval for provision for students to appeal for a review of evaluation

Resolution

The subject was considered and resolved to approve the provision for students to appeal for a review of evaluation if there is any total mistake or omission in the evaluation.

Dr. P. Sami, Dean – Students Services moved the fifth subject

Subject 5:

Approval of exempting differently abled students from Part V

Resolution

The subject was considered and resolved to exempt the differently abled students from Part V of the curriculum.

Dr.K.Rajarathinam, Co-ordinator, Department of Bio-Engineering moved the sixth subject

Subject 6:

Approval for introduction of E-assessment in Part A in M.Phil Courses

Resolution

The subject was considered and resolved to approve the introduction of e-assessment in part-A of all M.Phil. courses from the academic year 2013-2014.

Dr.R.Selvam, Dean-Arts moved the seventh subject

Subject 7:

Approval for changing Question pattern for Part IV subjects

Resolution

The subject was considered and resolved to approve the changes in the question pattern for Part IV subjects from the next academic year.

Dr.Mercy Pushpalatha, University Nominee suggested that a Faculty Training Programme may be arranged inviting Dr.Thangamuthu, Former Vice-Chancellor of
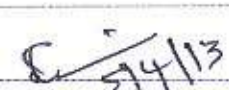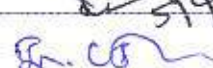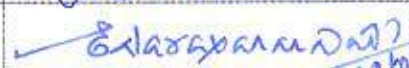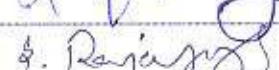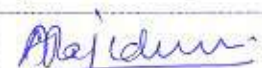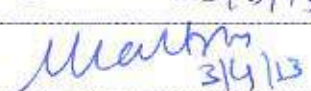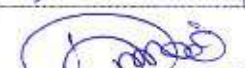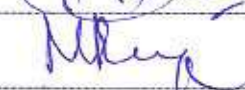
Bharathidasan University, Trichy for enlightening the teachers on the mechanism of autonomy.
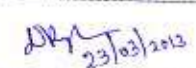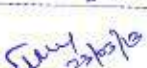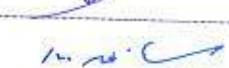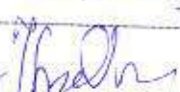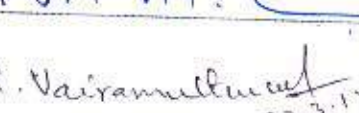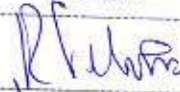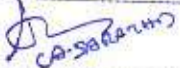
All resolutions were unanimously passed.
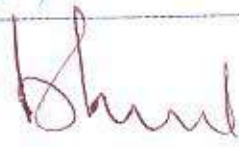
Out of 42 members, 34 turned out for the meeting and 8 members got permission to absent.

Thiru R. Palaniappan, the Member Secretary proposed vote of thanks and the meeting came to an end.

Members Present:

S.No.	Name & Designation	Signature
1.	Dr. S. Jayaram, M.A.,M.Phil.,Ph.D.,P.G.Dip.in S.S	
2.	Dr. K. Sridhar, M.A.,M.Phil.,Ph.D.,P.G.D.J.M.C	
3.	Dr. A. Mohan Kumar, M.A.,M.Phil.,Ph.D.	
4.	Dr. E. Narayanan Nadar, M.A.,M.Phil.,Ph.D.	
5.	Dr. G. Ravi,M.A.,M.Phil.,M.L.I.S.,Ph.D.	
6.	Thiru S. Muthuraj, M.Sc.,M.Phil.	
7.	Thiru S. Raja Singh, M.Sc.,M.Phil.	
8.	Dr. R. Boominathan, M.Sc.,M.Phil.,Ph.D.	
9.	Dr. A. Rajendran, M.Sc.,M.Phil.,Ph.D.	
10.	Thiru V. Shanmugavelu, M.Sc.,M.Phil.	
11.	Dr. T. Kathirvalavakumar, M.Sc.,PGDCA.,M.Phil., Ph.D.	
12.	Dr. M. Sakthivel, M.Com.,PGDCA.,Ph.D.	
13.	Dr. C. Chelladurai, M.Com.,PGDCA.,Ph.D.	
14.	Thiru M. Kumar, M.B.A.,M.Phil.,PGDPM &IR.	

15.	Dr. T. Arulvelan, B.V.S.,M.B.A.,C.A.I.I.B.	
16.	Dr. R. Neelamegam, M.Com.,Ph.D.	
17.	Thiru T. Durai Anand, M.Sc.,M.Phil.	
18.	Thiru D. Raj Kumar, M.C.A.,M.Phil.	
19.	Thiur T. Murugesan, MPES.,M.Phil.,PGDY.,PGDSM	
20.	Mrs. T. Sasikala, M.A.(Hindi)	
21.	Dr. K. Rajarathinam, M.Sc.,Ph.D.	
22.	Dr. J. Samuel Kirubahar, M.A.,M.Phil.,Ph.D.,B.Ed.	
23.	Dr. N. Prithivikumaran, M.Sc.,M.Phil.,Ph.D.,PBDCSA.	
24.	Dr. R. Vairamuthuvel, M.Com.,M.Phil.,M.B.A. PGDCA.,Ph.D.	
25.	Thiru S.P.G.C.Brindavan, M.B.A.	
26.	Dr. A. Mercy Pusphalatha, Principal, Lady Doak College (Autonomous), Tallakulam, Madurai – 625 002.	
27.	Dr. M. Kannan, Principal, S.N. College (Autonomous), Madurai.	
28.	Thiru R. Palaniappan, M.C.A.,M.Phil.,	
29.	Dr. R. Selvam, M.A.,M.Phil.,Ph.D., Dean - Arts	
30.	Dr. A. Sarathi, M.Sc.,M.Phil.,Ph.D., Dean - Internal Exams	
31.	Dr. P. Sami, M.Sc., M.Phil.,Ph.D. Dean - Students' Services	

32.	Dr. S. Manickavel, M.Com.,M.B.A.,Ph.D. Controller of Examinations	
33.	Dr. N. Ashok Kumar, M.Com.,Ph.D. Joint Controller of Examinations	
34.	Dr. P.Sundara Pandian, M.Com.,M.B.A.,M.A. M.Phil.,PGDPM&IR.,PGDCA.,DLLAL.,Ph.D.	

Part I - Tamil
பாடத்திட்டம்

பருவம்	பாடம்	பயிற்றுக்காலம்	அக மதிப்பெண்	புற மதிப்பெண்	மொத்த மதிப்பெண்	மதிப்பீடுகள்	Subject code	Revision
I	இக்கால இலக்கியம்	6	25	75	100	3	U1PT11	
II	அற இலக்கியமும் காப்பிய இலக்கியமும்	6	25	75	100	3	U1PT21	
III	பக்தி இலக்கியமும் சிற்றிலக்கியமும்	6	25	75	100	3	U1PT31	Revised
IV	சங்க இலக்கியம்	6	25	75	100	3	U1PT41	Revised

இளநிலை பட்ட வகுப்புக்களுக்குரிய பொது விருப்பப்பாடத்
தெரிவுமுறைப் பாட அமைப்புகள் (CBCS)
மூன்றாம் பருவம்
பக்தி இலக்கியமும் சிற்றிலக்கியமும்

தகுதிப் புள்ளிகள் 3   Subject Code- U1PT31
காலம் - வாரம் - 6 மணிகள்
Contact hours per semester: 90
நோக்கம் :-

- பக்தி இலக்கிய வகைமைகளையும் சிற்றிலக்கிய வகைமைகளையும் தெரிதல்.
- இவ்விலக்கியங்களில் காணலாகும் கருத்துக்களையும் அவை எழுந்த சூழலையும் மாணவர்களுக்கு அறிமுகம் செய்தல்.

பயன் :-

- சமயமும் தமிழும் இரண்டறப் பொருந்தி நிற்கும் பான்மையினை மாணவர்கள் அறிதல்.
- பக்தி இலக்கியங்கள் வழி சமயப்பொதுமையையும் மெய்ப்பொருள் தன்மையையும் உணர்த்துதல்.
- பக்தி இலக்கியங்களில் காணலாகும் கவித்துவத்தையும், சமூக மேம்பாட்டுக் கருத்துக்களையும் அறிந்து கொள்ளுதல்.

கூறு 1   காலம்:18 மணி நேரம்
திருஞானசம்பந்தர் தேவாரம் : நமச்சிவாயத் திருப்பதிகம் (முதல் மூன்று பாடல்கள்)
       1. காத லாகிக் கசிந்துகண் ணீர் மல்கி
       2. நம்பு வாரவர் நாவில் நவிற்றினால்
       3. நெக்கு எார்வ மிகப்பெரு இந்நினைந்

திருநாவுக்கரசர் தேவாரம் : திரு அதிகை வீரட்டானம் (முதல் மூன்று பாடல்கள்)
       1. கூற்றாயின வாறு விலக்ககிலீர்
       2. நெஞ்சம் உமக்கே இடமாக வைத்தேன்
       3. பணிந்தாரன பாவங்கள் பாற்றவல்லீர்

சுந்தரர் தேவாரம்: திருமழபாடி (முதல் **மூன்று** பாடல்கள்)
1. பொன்னார் மேனியனே
2. கீளார் கோவணமும்
3. எம்மான் எம் அனையென்று

மாணிக்கவாசகர் - திருப்பொன்னூரசல் (முதல் **மூன்று** பாடல்கள்)
1. சீரார் பவளங்கால் முத்தம் கயிறாக....
2. மூன்றங் கிலங்கு நயனத்தன் மூவாத....
3. முன்ஈஃறும் ஆதியு மில்லான் முனிவர்குழாம்.....

திருமங்கையாழ்வார் - பெரிய திருமொழி முதல் திருமொழி (பெரிய திருமந்திரத்தின் பெருமை)
1. வாடினேன் வாடி வருந்தினேன்....
2. ஆவியே! அமுதே! என நினைந்துருகி....
3. சேமமே வேண்டித் தீவினை பெருக்கித்.....
4. வென்றியே வேண்டி வீழ் பொருட்கிரங்கி.....
5. கள்வனேனானேன் படிறு செய்திருப்பேன்....

ஆண்டாள் - திருப்பாவை (முதல் ஐந்து பாடல்கள்)
1. மார்கழித் திங்கள் மதிநிறைந்த நன்னாளால்....
2. வையத்து வாழ்வீர்காள்! நாமும் நம்பாவைக்கு....
3. ஓங்கியுல களந்த உத்தமன் பேர்பாடி......
4. ஆழிமழைக் கண்ணா! ஒன்று நீகைகரவேல்.....
5. மாயனை மன்னு வடமதுரை மைந்தனை.....

கூறு: 2   காலம்:18 மணி நேரம்
திருமூலர் - திருமந்திரம் (கள்ளுண்ணாமை)
1. கழுநீர் பசுப்பெறில் கயந்தொறும் தேரா.....
2. சித்தம் உருக்கிச் சிவம் ஆம் சமாதியில் .....
3. காமமும் கள்ளும் கலதிகட்கே ஆகும்.....
4. வாமத்தோர் தாமும் மது உண்டு மாள்வர்.....
5. மயங்கும், தியங்கும், கள்வாய்மை அழிக்கும்.....

அருணகிரிநாதர் - திருப்புகழ்
1. முத்தைத்தரு பத்தித் திருநகை...
2. நாத விந்துக லாதீ நமோநம....

சித்தர் பாடல் - சிவவாக்கியர் பாடல்கள்
1. சாதி ஆவது ஏதடா? சலந்திரண்ட நீரெலாம்....
2. கறந்தபால் முலைப்புகா, கடைந்த வெண்ணெய்...
3. மையடர்ந்த கண்ணினார் மயக்கிடும்...
4. கருவிருந்த வாசலால் கலங்கு கின்றஊமைகாள்....
5. தீர்த்தம் ஆடவேணுமென்று தேடுகின்ற.....

வள்ளலார் - பிள்ளைச் சிறு விண்ணப்பம்
1. தடித்தஞ் மகனைத் தந்தைஃண்ட டடித்தால்.....
2. பெற்றதம் பிள்ளைக் குணங்களை எல்லாம் .....
3. வெம்மதிக் கொடிய மகன்கொடுஞ் செய்கை....
4. பொய்ப்பிழை அனந்தம் புகல்கின்றேன்....
5. அப்பணி முடிஎன் அப்பனே மன்றில்......

தாயுமானவர் : பராபரக் கண்ணி (முதல் பத்து கண்ணிகள்)

1. சீர்ஆரும் தெய்வத்.....
2. அன்பைப் பெருக்கி.....
3. கூர்த்த அறிவு.....
4. எண்ணாத எண்ணம்....
5. நன்று அறியேன்.....
6. எத்தனைதான்....
7. சொன்னதைச் சொல்வது...
8. கொல்லாவிரதம்.....
9. உன்னை நினைந்து.....
10. எவ்வுயிரும் என் உயிர் போல்...

எச்.ஏ. கிருஷ்ணபிள்ளை - இரட்சணிய மனோகரம், பால்ய பிரார்த்தனை. செபமாலை. (7. பாடல்கள்)

1. அண்ணலேயுன தாலயம்...
2. நாளும்வேண்டுவ நல்கியே...
3. உம்பருக்கர சேயுனை....
4. ஈன்றுளோரடி யேனுடன்....
5. அகிலலோகமு மநுதினம்....
6. எந்தையே யுலகி யாவையும்....
7. வேதம்வாழ்கமெய் வேதியர்....

குணங்குடி மஸ்தான் சாகிபு பாடல்கள் - முகைதீன் சதகம் - மூன்று பாடல்கள்.

1. வேரற்ற சுத்தபரி பூரணப் பேரின்ப....
2. சாதியே தத்தையும் மாதர்போ கத்தையும்....
3. நிதியாசை யற்றுதுற வதியாசை யுற்றுநன்.....

கூறு 3   காலம்:18 மணி நேரம்

நந்திக்கலம்பகம் - (ஐந்து பாடல்கள்)

1. ஊரும் அரவமும் தாமரைக்காடும் உயர்வனமும்.....
2. இந்தப்புவியில் இரவலருண்டென்ப தெல்லாம்.....
3. பதிதொறு புயல்பொழி தரு மணி......
4. அதிர் குரல மணி நெடுந்தேர்.....
5. நூற்கடற் புல வன்னுரை வெண்திரை.....

தமிழ்விடுதூது (முதல் 10 கண்ணிகள்)

1. சீர் கொண்ட கூடற் சிவராச தானிபுரந்......
2. இசையுந் தமிழர சென் றேத் தெடுப்பத் திக்கு.....
3. செய்ய சிவ ஞானத் திரளோட்டி லோரேடு.....
4. கூடல் புரந்தொருகாற் கூடற் புலவெரெதிர்....
5. மன்னுமூ வாண்டில் வடகலையுஞ் தெங்கலையும்......
6. முன்றுவிழி யார்முன் முதலையுண்ட பிள்ளையைப்பின்.....
7. தேடிமுடியாவடியைத் தேடாதே நல்லூரிற்.....
8. மட்டோலைப் பூவனையார் வார்ந்தோலை சேர்த்தெழுதிப்.....
9. ஒல்காப் பெருந்தமிழ் மூன்றோதியருண் மாமுனியும்....
10. பாத்திரங்கொண்டே பதிபாற் பாய் பசுவைப் பன்னிரண்டு....

கலிங்கத்துப் பரணி (காடு பாடியது) - (10 பாடல்கள்)

1. களப்போர் விளைந்த கலிங்கத்துக்......
2. வற்றல் வாகை வறந்த கூகை....,
3. தீய அக்கொடிய கானகத்தரை.....
4. ஆடுகின்ற சிறை வெம் பருந்தின் நிழல்....
5. "ஆதவம் பருகும்" என்று நின்ற நிழல்....
6. தீயின் வாயின் நீர் பெறினும் உண்பதோர்.....
7. இந்நிலத்துளோர் ஏகல் ஆவதற்கு.....
8. இருபொழுதும் இரவி பசும் புரவி விசும்பு....
9. காடு இதனைக் கடத்தும் எனக் கருமுகிலும்....
10. விம்மு கடுவிசை வனத்தின் வெம்மையினைக்....

திருக்குற்றாலக்குறவஞ்சி - (நாட்டுவளம் கூறுதல்) (ஐந்து பாடல்கள்)

1. சூழ மேதி இலங்குந்துறையிற்....
2. தக்கபூமிக்கு முன்புள்ள நாடு....
3. அஞ்சு நூறு மகம் கொண்ட நாடு.....
4. மாதம் மூன்றும் மழையுள்ள நாடு....
5. ஓடக்காண்பது பூம்புனல் வெள்ளம்....

முக்கூடற்பள்ளு - முக்கூடலின் சிறப்பு - (ஆறு பாடல்கள்)

1. கொண்டல் கோபுரம் அண்டையில் கூடும்.....
   மருதூர் வளம்
2. சங்கம் மேடைகளம் எங்கும் உலாவும் ....
   ஆசூர் நாட்டு வளம்
3. கறை பட்டுள்ளது வெண்கலைத் திங்கள்....
   தென்கரை நாட்டு வளம்
4. காயக் கண்டது சூரிய காந்தி....
   முக்கூடல் வளம்
5. சோதி மாமணி வீதி நெருக்கும்....
   மருதூர் வளம்
6. தத்தும் பாய் புனல் முத்தம் அடைக்கும்.

கூறு எ 4   காலம்:18 மணி நேரம்
இலக்கணம்
1. யாப்பருங்கலக்காரிகை - உறுப்பியல்
                எழுத்து, அசை, சீர், தளை, அடி, தொடை .

2. அணியிலக்கணம்- தன்மையணி, உவமை, உருவகம், பிறிதுமொழிதல்,
                தற்குறிப்பேற்றம், வஞ்சப்புகழ்ச்சி, வேற்றுமை, பின்வருநிலையணி

3. கடிதம் வரைதல் - பாராட்டுக்கடிதம், விண்ணப்பக்கடிதம், புகார்க்கடிதம்.
கூறு எ 5   காலம்:18 மணி நேரம்
இலக்கியவரலாறு
1. பக்தி இலக்கிய வரலாறு (சைவம், வைணவம், கிறித்தவம், இசுலாமியம், சமணம், பௌத்தம்)
2. சிற்றிலக்கிய வரலாறு

நான்காம் பருவம்

சங்க இலக்கியம்

தகுதிப் புள்ளிகள் 3   Subject Code- U1PT41

காலம் - வாரம் - 6 மணிகள்

Contact hours per semester: 90

நோக்கங்கள்

- ஈ·ராயிரம் ஆண்டுக்கு முற்பட்ட தமிழின் செழுமையினையும் தொன்மையினையும் உணரச் செய்தல்.
- உலகின் ஆதி சமயச் சார்பற்ற மக்கள் இலக்கியத்தைப் புரியச் செய்தல்.

பயன்

- சார்பும் சாய்வும் இன்றி மனிதரைப் பார்க்கப் பழகும் பண்பினைப் பெறுதல்
- எளிதாய் உறுதியாய் மகிழ்வாய் வாழப் பழகும் மனநிலை பெறல்

கூறு 1 : பத்துப்பாட்டு   காலம்:18 மணி நேரம்

    நெடுநல் வாடை - முழுவதும்

கூறு 2 : எட்டுத் தொகை   காலம்:18 மணி நேரம்

1. நற்றிணை - ஐந்து பாடல்கள்

அ. குறிஞ்சி : 'நன்னுதல் பசப்பினும் ....' (இளநாகனார்)

ஆ. முல்லை : 'நீரற்ற வறந்த நிரம்பா...... '(இளந்திரையன்)

இ. மருதம் : 'வாராய் பாண நகுகம்' .... (உறையூர் கதுவாய்ச் சாத்தனார்)

ஈ. நெய்தல் : 'பெய்யாது வைகிய' .... (உலோச்சனார்)

உ. பாலை: 'ஈ·ன்பருந்து உயவும்' ....(இளங்கீரனார்)

2. குறுந்தொகை - ஐந்து பாடல்கள்

அ. குறிஞ்சி: 'கொங்குதேர் வாழ்க்கை' - (இறையனார்) - 2

ஆ. முல்லை: 'மட்டம்' பெய்த......... (அரிசில் கிழார்) - 193

இ. மருதம் : 'குக்கூ என்றது கோழி' (அறிவுடை நம்பி) - 230

ஈ. நெய்தல் : 'அம்ம வழி தோழி' (அறிவுடை நம்பி) - 230

உ.பாலை: 'நிலையாய்' வாழி தோழி' (ஈழத்துப்பூதன் தேவனார்) 343

3. ஐங்குறு நூறு   : 'வெள்ளாங்குருகுப் பத்து' ...... (10 பாடல்கள்)

4. பதிற்றுப பத்து   : அரிசில்கிழார், எட்டாம்பத்து   (2 பாடல்கள் மட்டும்)

        இகல் பெருமையிற் ...... பாடல் எண் 72.

        கேள்வி கேட்டு .... பாடல் எண் 74.

5. கலித்தொகை   : கபிலர், குறிஞ்சி -

        'காமர் கரும்புனல் .... பாடல் எண் 39.

6. அகநானூறு   : - மூன்று பாடல்கள்

        அ. முல்லை : 'மதவலியானை' (கடுவன் நள்ளனார்)   354

        ஆ, நெய்தல் : 'கானல் மாலை' (குன்றியனார்)   40

        இ, பாலை   : 'ஓங்குமலை சிலம்பில்' .... (ஒளவையார்) 147

7. புறநானூறு :

அ. 'வள்ளியோர் படர்ந்து' - (கோவூர்க்கிழார்)   47

ஆ. 'ஆடுநடை புரவியும்' - (குட்டுவன் கீரனார்) 240

இ. 'குழவி இறப்பினும்' ...... (சேரமான் கணைக்கால் இரும்பொறை)   74

ஈ. 'உண்டாலம்ம' ...... (இளம் பெருவழுதி) 182

உ. 'கானல் மேய்ந்து' .... (உறையூர் ஏணிச் சேர முடமோசியார்)   374

கூறு 3:   **உரை நடை -** (சங்க இலக்கியக் கட்டுரைகள்)   காலம்:18 மணி நேரம்

கூறு 4:   காலம்:18 மணி நேரம்

இலக்கணம்.

1. அகப்பொருள் - அகத்திணைகள்
2. புறப்பொருள் - புறத்திணைகள்
3. இறைச்சி, உள்ளுறை -
4. மரபியல்   - பெயர் மரபுகள் - ஆண்பால், பெண்பால், இளமைப் பெயர்கள்.

கூறு 5:   காலம்:18 மணி நேரம்

இலக்கிய வரலாறும், படைப்பாற்றலும்.

அ) 1. பத்துப்பாட்டு
     2. எட்டுத்தொகை

ஆ)   படைப்பாற்றல்- கவிதை, கட்டுரை படைத்தல்

Course Name   :   **B.A.**

Discipline   :   **Tamil Literature**

பாடத்திட்டம்

பருவம்	பகுதி	பாடம்	பயிற்றுக் காலம்	அக மதிப்பெண்	புற மதிப்பெண்	மொத்த மதிப்பெண்	மதிப்பீடுகள்	Subject code	Revision
III	Part I	தமிழ்	6	25	75	100	3	U1PT31	Revised
	Part II	ஆங்கிலம்	6	25	75	100	3	U1PE31	Revised
	Core 3	பக்தி இலக்கியம்	5	25	75	100	4	U1TAC31	Revised
	Core 4	இலக்கணம் - யாப்பும் அணியும்.	5	25	75	100	4	U1TAC32	No Change
	Allied 3	மக்கள் தகவல் தொடர்பியலும் விளம்பரமும்	6	25	75	100	5	U1TAA31	Revised
	SBE I	மொழி பெயர்ப்பியல்	2	25	75	100	2	U1TAS31	Revised
IV	Part I	தமிழ்	6	25	75	100	3	U1PT41	Revised
	Part II	ஆங்கிலம்	6	25	75	100	3	U1PE41	Revised
	Core 7	காப்பிய இலக்கியம்	4	25	75	100	4	U1TAC41	Revised
	Core 8	பொருள் இலக்கணம் - நம்பியகப் பொருள் (ஒழிபியல் நீங்கலாக)	4	25	75	100	4	U1TAC42	No Change
	Allied 4	நாட்டுப்புற இலக்கியங்களும் கோட்பாடுகளும்	6	25	75	100	5	U1TAA41	Revised
	SBE 2	ஆட்சித்தமிழ்	2	25	75	100	2	U1TAS41	New
	SBE 3	பத்திரிக்கைகளும் பத்திரிக்கைத் தமிழும்.	2	25	75	100	2	U1TAS42	New
	Year I & II Part V	NSS / NCC / Physical Education-Sports	-				1	U1NS1/ U1NC1/ U1PS1	Revised

பக்தி இலக்கியம்

தகுதிப்புள்ளிகள் - 4   Subject Code - U1TAC31

காலம் (வாரம்) - 5 மணிகள்

Contact hours per semester: 75

நோக்கம் :-

        பக்தி இலக்கியங்கள் தோன்றிய காலச் சூழலை அறியச் செய்து, பக்தி இலக்கியங்கள் சார்ந்த நெறிகளை அறியச் செய்தல்.

பயன்:-

பல்வேறு காலக் கட்டங்களில் பக்தி இலக்கியங்களில் இடம் பெற்றுள்ள பாடல்களை அறிந்து கொள்ளச் செய்து அவற்றின் மூலம் பல்வேறு சமயங்களில் இடம் பெறும் பக்தி உணர்வை உணரச் செய்தல்

கூறு 1 :-   **காலம்:15 மணி நேரம்**
    தேவாரம்: 1) திருஞானசம்பந்தர். (காதலாகிக் கசிந்து.... முதல் பத்துப் பாடல்கள்) [நமச்சிவாயப்பதிகம்]
             2) திருநாவுக்கரசர் (திருக்குறுந்தொகை) [அன்னம் பாலிக்கும்...... முதல் பத்துப் பாடல்கள்]
             3) சுந்தரர்.[ஆலந்தான் உகந்து .....முதல் பத்துப் பாடல்கள்] திருக்கச் சியேகம்பம்
    திருவாசகம்: 4) மாணிக்கவாசகர். [பிடித்த பத்து] [உம்பர்கட் கரசே.......முதல் பத்துப் பாடல்கள்]

கூறு 2 :- திருவாய்மொழி -   **காலம்:15 மணி நேரம்**
    நம்மாழ்வார் :- முதலாம்பத்து - 1 ஆம் திருவாய்மொழி [உயர்வற உயர்நலம்.....முதல் பத்துப் பாடல்கள்]
    திருமங்கையாழ்வார்:- திருவெழுக்கூற்றிருக்கை [ஒரு பேர் உந்தி எனத் தொடங்கும் பாடல்]
    பெரியாழ்வார்   : 'மூன்றாம் பத்து' "தன்னேராயிரம் தொடங்கி முப்போதும் கடைந்த வரை 5 பாடல்கள்
    ஆண்டாள்   : நாச்சியார் திருமொழி - தையொரு திங்கள் தொடங்கி "வாளிடை வாழும் வரை" 5 பாடல்கள்.

கூறு 3 :-   **காலம்:15 மணி நேரம்**
     1) திருமந்திரம், அடிமுதல் தேடல் [பிரமனும் மாலும்..........பத்துப் பாடல்கள்]
     2) குமர குருபரர், கந்தர் கலிவெண்பா - முருகனின் தோற்றம்! ஆறுமுகங்கள் [தோய்ந்த நவ ரத்நச்.....எனத் தொடங்கும் கண்ணி முதல் 11 கண்ணிகள்]
     3) திருவருட் பிரகாச வள்ளலார் - அருள்விளக்க மாலை [அருள் விளக்கே.......முதல் 5 பாடல்கள்
     4) தாயுமானவர் [பாயப் புலி முன்...... முதல் 5 பாடல்கள்]

கூறு 4 :-   **காலம்:15 மணி நேரம்**
     1) இரட்சணிய மனோகரம் [செபமாலை][பத்தியாய்ச் செபம்...... முதல் 10 பாடல்கள்]
     2) குணங்குடி மஸ்தான் சாகிபு. [நிராமயக் கண்ணி] [ஆதி முதலே அகண்டபரி....... தொடங்கி 'உத்தமர்க்காகா'.... ,முடிவது வரையிலான 20   கண்ணிகள்]

கூறு 5:- சித்தர் பாடல்கள்   **காலம்:15 மணி நேரம்**
     1) பட்டினத்தார் - 5 - பாடல்கள் - திருஏகம்பமாலை
     1. [பிறக்கும் பொழுது (7)....]
     2. கல்லாப் பிழை - (3) பொருளுடையோரை---- (4) ஆற்றில் கரைத்த---- (5) கல்லார் சிவகதை(25)
சிவவாக்கியர்,- ஞானநிலை
     1) என்னிலே இருந்த ஒன்றை......(6)
     2) தங்கம் ஒன்று ரூபம் ......(28)
     3) ஆலவித்தில் ஆல் ஒடுங்கி......(91)
பாம்பாட்டிச் சித்தர் :- (அகப்பற்று நீக்கல்)
     1) தாமரையின் இலையிலே.......
     2) சொல்லும் புளியம் .....
     3) எண்ணெய்க்குந்......
கடுவெளிச் சித்தர்:- (ஆனந்தக் களிப்பு)
     1) நீர் மேற் குமிழியிக்.......
     2) நல்ல வழி தனை.....
     3) அன்பெனும் நன்மலர்......

அழுகணிச் சித்தர் :-
     1) பையூரி லேயிருந்து.....
     2) பற்றற்ற நீரதிலே.....
     3) உன்னை மறந்தல்லோ.....

குதம்பைச் சித்தர் :-
     1) முத்தமிழ் கற்று-----
     2) மாங்காய்ப் பால்-----
     3) தன்னை அறிந்து-----

அகப் பேய்ச் சித்தர்:-
     1)உன்னை அறிந்தக்கால்-----
     2)வானம் ஓடிவரில்-----
     3) ஆணவ முல மடி-----

<u>பாட நூல்கள்:-</u>
1) பன்னிரு திருமுறைகள்
     சைவ சித்தாந்த நூற்பதிப்புக் கழகம்
     சென்னை.
2) நாலாயிரத் திவ்வியப் பிரபந்தம்
     மயிலை மாதவ தாசன்
     மணலி லட்சுமண முதலியார் ஸ்பேசிபிக் எண்டோமேன்ட
     98/99 வரதமுத்தியப்பன் தெரு
     சென்னை-1.
3) திருமந்திரம்
     கழக வெளீயிடு
     சென்னை.
4) சித்தர் பாடல்கள்
     த. கோவேந்தன்
     பாவை பப்ளிகேஷன்ஸ்
     142, ஜானி ஜான் கான் சாலை
     இராயப்பேட்டை, சென்னை-14 (2006)
5) திருவருட்பா-மூலமும் உரையும்
     ஒளவை சு. துரைசாமிப் பிள்ளை உரை
அண்ணாமலைப் பல்கலைக் கழக வெளியீடு
     சிதம்பரம்.
6) இரட்சணிய மனோகரம்
     வேதாக ம மாணவர் பதிப்பகம்
     66/7 அசோசியேசன் சாலை
     மாதவரம், சென்னை.
7) தாயுமானவர் பாடல்கள்
     பி. இரத்தின நாயகர் சன்ஸ்
     சென்னை-1953.
8) குமர குருபரர் பிரபந்தத் திரட்டு
     வர்த்தமானன் பதிப்பகம்
     சென்னை.
9) குணங்குடி மஸ்தான் சாகிபு பாடல்கள்
   'குணங்குடி மஸ்தான் சாகிபு'.

இலக்கணம் - யாப்பும் அணியும்

தகுதிப் புள்ளிகள் - 4   Subject Code - U1TAC32
காலம் - வாரம் - 5 மணிகள்
Contact hours per semester: 75

நோக்கங்கள்:

        மரபு வழியாகத் தமிழைக் கற்றல்.
        இலக்கண விதிகளைக் கற்றல்.

பயன்:

        பிழையின்றி எழுதவும், கற்கவும் தெரிந்து கொள்ளுதல்.

கூறு 1	-	உறுப்பியல்	காலம்:15 மணி நேரம்
கூறு 2	-	செய்யுளியல்	காலம்:15 மணி நேரம்
கூறு 3	-	ஒழிபியல்	காலம்:15 மணி நேரம்
கூறு 4	-		காலம்:15 மணி நேரம்
		தண்டியலங்காரம் - பொருளணியியல் முதல் 15 அணிகள் (பிற அலங்காரங்களோடு கூடிய பகுதிகள் நீங்கலாக)	
கூறு 5	-	எஞ்சிய அணிகள் (20 அணிகள்)	காலம்:15 மணி நேரம்

பாடநூல்

        யாப்பருங்கலக்காரிகை - அமிர்தசாகரர்
        கழகவெளியீடு, சென்னை.

மக்கள் தகவல் தொடர்பியலும் விளம்பரமும்

தகுதிப் புள்ளிகள் - 5   Subject Code - U1TAA31
காலம் - வாரம் - 6 மணிகள்
Contact hours per semester: 90

நோக்கங்கள்

     1. தொடர்பியலைப் புரிந்து கொள்ளுதல்
     2. மக்கள் தகவல் தொடர்புக் கருவிகளின் வகை, தொகை அறிதல்
     3. பத்திரிக்கைச் சட்டங்கள் குறித்த விழிப்புணர்வை மாணவர்களிடையே பரப்புதல்.

பயன்கள்

     1. தகவல் தொடர்புச் சாதனங்களின் மூலம் மக்களிடையே ஏற்படும் சமூக மாற்றத்தை அறியச் செய்தல்
     2. விளம்பரங்களின் முக்கியத்துவத்தையும் பயனையும் அறிதல்.

கூறு 1 தகவல் தொடர்பு   காலம்:18 மணி நேரம்

        தொடர்பு - விளக்கம், தொடர்பியலின் தோற்றமும் வளர்ச்சியும், தொடர்புக் கருவிகளின் நெறிமுறைகள், தொடர்புக் கருவிகளின் பணிகள்

கூறு 2 இதழியல் வரலாறு   காலம்:18மணி நேரம்

        தமிழ் இதழ்களின் வளர்ச்சி, இதழியல் முன்னோடிகள், முன்னோடி இதழ்கள், இலக்கிய இதழ்கள்

கூறு 3 அச்சு ஊடகம்   காலம்:18 மணி நேரம்

        செய்தி - விளக்கம், எழுதும் முறைகள், செம்மையாக்கம், சஞ்சிகை இதழியல், பக்கவடிவமைப்பு, பத்திரிக்கைச் சட்டங்கள்

கூறு 4 மின்னணு ஊடகங்கள் காலம்:18 மணி நேரம்

வானொலி - தொலைக்காட்சி - திரைப்படத் தோற்றமும் நிகழ்ச்சி தயாரிப்பும், பரப்புதலும்

கூறு 5 விளம்பர அடிப்படைகள் காலம்:18 மணி நேரம்

விளம்பரம் - விளக்கம், குறிக்கோள், பயன், நெறிமுறைகள், விளம்பரவரலாறு, விளம்பரவகைகள், விளம்பரச்சாதனங்கள், விளம்பரத்தாக்கங்கள்

பாடநூல்கள்

(1) மக்கள் ஊடகத் தொடர்பியல் அடிப்படைகள்
பதிப்பாசிரியர்கள் : டாக்டர் அ. சாந்தா, டாக்டர் வீ. மோகன்
மீடியா பப்ளிகேஷன்ஸ்,
52, வீரமுத்து கார்டன்
ஸ்ரீநகர் (விசாலம்)
ஆனையூர் (அஞ்சல்)
மதுரை - 625 017,

(2) மக்கள் ஊடகத் தொடர்பியல் - புதிய பரிமாணங்கள்
பதிப்பாசிரியர்கள் : டாக்டர் அ. சாந்தா, டாக்டர் வீ. மோகன்
மீடியா பப்ளிகேஷன்ஸ்,
52, வீரமுத்து கார்டன்
ஸ்ரீநகர் (விசாலம்)
ஆனையூர் (அஞ்சல்)
மதுரை - 625 017,

பார்வை நூல்கள்:

1. வெ. கிருட்டிணன்	-	தகவல் தொடர்பியல், மணிவாசகர் பதிப்பகம், சென்னை.
2. சிவ. சசிரேகா	-	தகவல் தொடர்பியல் மாதிரிகளும் கோட்பாடுகளும் சகா பப்ளிகேஷன்ஸ், மதுரை.
3. கி.ராசா	-	மக்கள் தகவல் தொடர்பியல் அறிமுகம் பாவை பப்ளிகேஷன்ஸ், சென்னை.
4. எஸ். ஸ்ரீகுமார் & என்.கிருஷ்ணன்	-	மக்கள் தகவல் தொடர்பியல், செண்பகா பதிப்பகம், சென்னை.
5. அ. விநாயகமூர்த்தி	-	விளம்பரக்கலை, பாலமுருகன் பதிப்பகம், மதுரை.

மொழிபெயர்ப்பியல்

தகுதிப் புள்ளிகள் - 2 Subject Code - U1TAS31

காலம் - வாரம் - 2 மணிகள்

Contact hours per semester: 30

நோக்கங்கள்

- மொழிபெயர்ப்பியல் துறையை அறிமுகம் செய்தல்.

- மொழிபெயர்ப்புக் கோட்பாடுகளையும் உத்திகளையும் மாணவ/மாணவியர்களுக்குத் தெளிவுறுத்தல்.

- மொழிபெயர்ப்புச்செய்வதற்கு ஆர்வம் ஊட்டுதல்.

பயன்பாடுகள்

* மொழிபெயர்ப்பின் தேவைகளை, அடிப்படைகளை மாணவ/மாணவியர் புரிந்து கொள்வர்.
* பிறமொழிகளிலிருந்து தமிழ் மொழிக்கு மொழி பெயர்ப்புச்செய்வதற்குப் பயிற்சி அளித்து இருமொழி அறிவுத்திறனை வளர்த்தல்.

கூறு 1   காலம்:6 மணி நேரம்
   அறிவும் மொழியும் - மொழிபெயர்ப்பு - பல்வகை விளக்கங்கள் - தோற்றமும் வளர்ச்சியும் - மொழிபெயர்ப்பின் பயன் - இன்றியமையாமை- நோக்கம் - இயல்புகள் - முக்கியப் பணிகள் - சிக்கல்கள் - சிக்கல்களின் வகைகள்.

கூறு 2   காலம்:6 மணி நேரம்
   மொழிபெயர்ப்பின் வகைகள் - மூன்று படிநிலைகள் - காலந்தோறும் மொழிபெயர்ப்பு - மரபுகள் - நிகரன்கள், விளம்பரம் - நல்லமொழிபெயர்ப்பு - மொழிபெயர்ப்பாளர்களுக்கான அடிப்படைத் தகுதிகள் - மொழிபெயர்ப்பாளரின் வகைகள் - சொல்லாக்க உத்திகள் - ஒலிபெயர்ப்பு.

கூறு 3   காலம்:6 மணி நேரம்
   கவிதை மொழிபெயர்ப்பு - பத்திரிகை மொழிபெயர்ப்பு - வானொலி மொழிபெயர்ப்பு - அறிவியல் மொழிபெயர்ப்பு - இயந்திர மொழிபெயர்ப்பு - கணிப்பொறிவழி மொழிபெயர்ப்பு, படைப்பிலக்கியங்கள் மொழிபெயர்ப்பு - புனைகதை மொழிபெயர்ப்பு - நாடகங்கள் மொழி பெயர்ப்பு.

கூறு 4   காலம்:6 மணி நேரம்
   தென்னிந்திய மொழிகளில் மொழிபெயர்ப்பு - பாரதியின் மொழிபெயர்ப்பு - பகவத் கீதை மொழிபெயர்ப்பு - விவிலிய மொழிபெயர்ப்பு - குறிப்பிடத்தகுந்த மொழிபெயர்ப்பாளர்கள்.

கூறு 5   காலம்:6 மணி நேரம்
   ஆட்சி ஆவணங்களை மொழிபெயர்த்தல் - உலக அரங்கு - பிறமொழிச்சொற்கள் - ஆங்கிலச்சொற்கள் - இணைப்பழமொழிகளும் மரபுத் தொடர்களும் - மொழிபெயர்ப்புச் சான்றுகள் - மொழிபெயர்ப்பதற்குப் பயிற்சி அளித்தல்.

பாடநூல்

முனைவர். ச. ஈஸ்வரன்-   'மொழிபெயர்ப்பியல்' பாவை பப்ளிகேஷன்ஸ், 142,
             ஜானி ஜான் கான் சாலை, இராயப்பேட்டை,
             சென்னை - 600014
             மூன்றாம்பதிப்பு - 2010. தொலைபேசி : 28482441, 28482973
             மின் அஞ்சல்: pavai@123yahoo.com

பார்வை நூல்கள்

சு. சண்முக வேலாயுதம்	-	மொழிபெயர்ப்பியல், உலகத் தமிழராய்ச்சி நிறுவனம், அடையாறு, சென்னை. 1985.
சேதுமணி மணியன்	-	மொழிபெயர்ப்பியல் கோட்பாடுகளும் உத்திகளும் செண்பகம் வெளியீடு, பிளாட் எண்: 4 மூவேந்தர் நகர், விசுவநாத புரம், மதுரை - 625014. 1990.
மு. வளர்மதி	-	மொழிபெயர்ப்புக் கலை, திருமகள் நிலையம், வெங்கட்நாராயணா சாலை, தி.நகர், சென்னை - 600017. 2003.
சி. சிவசண்முகம், வே.தயாளன்	-	மொழிபெயர்ப்பியல், அன்னம் வெளியீடு, சிவகங்கை. 1989.

காப்பிய இலக்கியம்

தகுதிப் புள்ளிகள் - 4	Subject Code- U1TAC41
காலம் - வாரம் - 4 மணிகள்	
Contact hours per semester: 60	

நோக்கம்

திணை இலக்கியங்கள் எனப்படும் சங்க இலக்கியங்களுக்குப் பிறகு பொருளமைதியாலும் யாப்பமைதியாலும் வேறுபட்ட இலக்கிய வடிவமாய்க் காப்பிய இலக்கியங்கள் தோன்றி, அரசு அல்லது சமயங்களின் கொள்கைவிளக்கக் கருவிகளாய் அமைந்திருத்தலையும், மரபிலக்கியக் காலம் முடிந்து நவீன இலக்கியக் காலம் வரை அவை நீடித்து வருதலையும் விளக்குதல்.

பயன்

அரசும் சமயமும் அதிகார மையங்களாய்க் காலந்தோறும் இருந்து வருவதைக் காப்பிய இலக்கியங்களின் வழி உணர்த்துதல்.

கூறு 1 : சிலப்பதிகாரம்	-	புகார் காண்டம் (முழுவதும்)	காலம்:12 மணி நேரம்
கூறு 2 : மணிமேகலை	-	முதல் 10 காதைகள்	காலம்:12 மணி நேரம்
கூறு 3 :			காலம்:12 மணி நேரம்
கம்பராமாயணம்	-	பாலகாண்டம்- திருஅவதாரப் படலம், அகலிகைப் படலம்	
பெரியபுராணம்	-	திருமூலநாயனார் புராணம்	
	-	காரைக்காலம்மையார் புராணம்	
	-	இயற்பகை நாயனார் புராணம்	
கூறு 4 : தேம்பாவணி	-	முதல் சருக்கம்	காலம்:12 மணி நேரம்
		ஐயம் நீங்குபடலம்	
சீறாப் புராணம்	-	நபி அவதாரப் படலம்	
		பாத்திமா திருமணப் படலம்	
கூறு 5 : பாரதியார்	-	பாஞ்சாலி சபதம்- சபதச் சருக்கம்	காலம்:12 மணி நேரம்
பாரதிதாசன்	-	புரட்சிக்கவி (முழுவதும்)	

பொருள் இலக்கணம் - நம்பியகப் பொருள்

தகுதிப் புள்ளிகள் - 4	Subject Code- U1TAC42
காலம் - வாரம் - 4 மணிகள்	
Contact hours per semester: 60	

நோக்கங்கள்

விரிந்த இலக்கணப் பரப்பைக் கொண்ட தமிழ் மொழியை மாணவர் உலகம் எளிதில் புரிந்து கொண்டு பயன் பெற வேண்டும்.

பயன்

பிழையின்றி எழுதவும், கற்கவும் தெரிந்து கொள்ளுதல்

கூறு 1	-	அகத்திணையியல்	காலம்:12 மணி நேரம்
கூறு 2	-	களவியல்	காலம்:12 மணி நேரம்
கூறு 3	-	வரைவியல்	காலம்:12 மணி நேரம்
கூறு 4	-	கற்பியல்	காலம்:12 மணி நேரம்
கூறு 5	-	ஒழிபியல்	காலம்:12 மணி நேரம்

பாடநூல்:
அகப்பொருள் விளக்கம்
- நாற்கவிராச நம்பி.
கழக வெளியீடு
சென்னை.

நாட்டுப்புற இலக்கியங்களும் கோட்பாடுகளும்

தகுதிப் புள்ளிகள் - 5   Subject Code- U1TAA41
காலம் - வாரம் - 6 மணிகள்
Contact hours per semester: 90

நோக்கங்கள்

நாட்டுப்புற மக்களிடம் உணர்ச்சிப் படிவங்களாக: பொருள் மிக்க வாய் மொழி இலக்கியங்களாக; பயன்படுபொருளாக நாட்டுப்புற இலக்கியங்கள் அமைந்துள்ளன. மனித மனத்தின் இயல்பான போக்கை அறிந்து காண உதவும் கருவியாகவும் இவை உள்ளன. இத்தகையப் புதைபொருள், வடிவங்களான நாட்டுப்புற இலக்கியங்களின் வழி வெளிப்படும் மக்களின் நம்பிக்கைகள் பழக்கவழக்கங்கள், ஆசைகள், பண்பாடுகளை அறியச்செயதல்.

பயன்

நாட்டுப்புற மக்களின் பண்பாடுகளை அறிந்து கொள்வதன் மூலம் மக்களின் பழம் பெருமைகளை அறிந்து கொள்ள உதவுதல். அழிந்து கொண்டிருக்கும் நாட்டுப்புற இலக்கிய வகைமைகளைக் காத்துக் கொள்ளும் எண்ணங்களை உருவாக்குதல்.

கூறு: 1 - நாட்டுப்புறப் பாடல்கள்   காலம்:18 மணி நேரம்
கணபதி- மாரியம்மன்- வருணன்
    1 காளையே ஏறு .... முந்தி முந்தி வினாயகனே ப:41 (த.நா.பா)
    2 சின்ன முத்தாம் .... ப:47 (த.நா.பா)
    3 பூமியை நம்பி........ப:71
    4 வேலி சலசலக்க .... ப:14 (முல்லை நிலப் பாடல்கள்)
    5 சிவன் - சிவந்திப் பூ சாமி மலரெடுத்து ப:16 (மு.நி.பா)

தாலாட்டுப் பாடல்கள்
1) ஆறாம் பெரியேரி......... ப:86 (த.நா.பா)
2) கண்ணே கண்மணியே .... ப:96 (த.நா.பா)
3) பாப்பார வீதிக்கு......ப:98 (த.நா.பா)
4) ஆரிரரோ ஆராரோ கண்ணே .... ப:114 (த.நா.பா)
5) கண்ணே உறங்குறங்கு .... ப:40 (மு.நி.பா)
6) மாமன் வந்து தாலாட்ட......... ப:44 (மு.நி.பா)
7) பாலை மலை மூங்கில் வெட்டி........ப:39 (மு.நி.பா)
8) வங்காள பச்சியெல்லாம்.........
        [தொட்டில் தொடங்கி தொடுவானம் வரை ப:9 கே.ஏ. குணசேகரன்]
9) காக்கா கருதறுக்க
        கட்டெறும்பு சூடடிக்க [ப:13 தொ.தொ. தொடுவானம் வரை]
10) திண்ணை மொழுகி....... [ப:16 தொ.தொ.தொ. வரை]

கூறு: 2 - காதல், குடும்பம்   காலம்:18 மணி நேரம்
    1) மழைக்கா இருட்டுக்குள்ள.......
                        த.நா.பா.   ப:138
    2) காதலி - நெல்லுக் கதிரானேன்......
                        த.நா.பா.   ப:139
    3) கணவன் பெருமை - சாப்பிட்டுக் கை கழுவி.....
                        த.நா.பா.   ப:179
    4) சந்தேகம் - போனா இருக்கமாட்டார்.....
                        த. நா.பா.   ப: 184
    5) திருமணத்திற்கு வேண்டல் - நந்தவனத்தழகு......
                        த.நா.பா   ப: 201
    6) காதலியின் வேதனை - கட்டக் கருதப்புள்ள......

த.நா.பா   ப:211

7) சீதனம் - என்ன சீதனங்கள் ....

த.நா.பா.   ப:286

8) இல்லறம் - அரிசி முளப்போட்டு.....

த.நா.பா.   ப:301

9) முக அழகைப் பார்த்துக்கிட்டு.....

த.நா.பா.   ப:307

10) பொருந்தாமணம் - சோளச் சோறு திங்க மாட்டேன்.....

த.நா.பா.   ப:309

11) மலடி - நனஞ்ச புழுதியிலே.....

த.நா.பா.   ப:323

ஒப்பாரி - 1) சீமை அழியுதுண்ணு.......

த.நா.பா.   ப:455

2) மடிகட்டிக்கல் பெறக்கி....

த.நா.பா.   ப:466

3) முத்து மழை பேயும்......

த.நா.பா.   ப:479

4) எட்டுக் கெசம் கல்லொடச்சு......

த.நா.பா.   ப:485

கூறு:3 - நாட்டுப்புறக் கதைகள்   காலம்:18 மணி நேரம்

அய்யம்மா கதைகள்
சைமன் ஜாண்.

கூறு: 4 - நாட்டுப்புறக் கதைப்பாடல்   காலம்:18 மணி நேரம்

பூச்சியம்மன் வில்லுப்பாட்டு
ஆ. சிவசுப்பிரமணியன்
நியூ செஞ்சுரி புக் ஹவுஸ்
மதுரை - 1989.

கூறு:5 - நாட்டார் வழக்காற்றியல் - கோட்பாடுகள்   காலம்:18 மணி நேரம்
தே. லூர்து
1) புராணவியல் கோட்பாடு
2) உளப்பகுப்பாய்வு கோட்பாடு
3) வாய்மொழி வாய்பாட்டுக் கோட்பாடு
4) நாட்டார் பண்பாட்டுக் கோட்பாடு
5) நாட்டார் வழக்காற்றியல்

<u>1) தமிழர் நாட்டுப் பாடல்கள்</u>
தொகுப்பாசிரியர் - நா. வானமாமலை
வெளியீடு - நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிட்
41-பி, சிட்கோ இண்டஸ்டிரியஸ் எஸ்டேட்
அம்பத்தூர், சென்னை - 600 098.
மே 2004

2) தொட்டில் தொடங்கி தொடுவானம் வரை
(நாட்டுப்புறப் பாடல்கள் தொகுப்பு)
தொகுப்பாசிரியர் - முனைவர். கே.ஏ. குணசேகரன்
வெளியீடு - நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிமிடெட்,
           41-பி, சிட்கோ இண்டஸ்டிரியஸ் எஸ்டேட்
           அம்பத்தூர், சென்னை - 600 098.
           ஆகஸ்ட் 2003.

3) பூச்சியம்மன் வில்லுப்பாட்டு - 1989
பதிப்பாசிரியர் - ஆ. சிவசுப்பிரமணியன்
வெளியீடு - நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிமிடெட்,
           41-பி, சிட்கோ இண்டஸ்டிரியஸ் எஸ்டேட்
           அம்பத்தூர், சென்னை - 600 098.

4) அய்யம்மா கதைகள்-
தொகுப்பாசிரியர் - சைமன் ஜாண்
வெளியீடு - Kallaathi
           18-A, Municipal Colony first street,
           Maharajanagar - 627 011
           November - 2001.

5) நாட்டார் வழக்காற்றியல் கோட்பாடுகள்
தொகுப்பாசிரியர் - தே. லூர்து
வெளியீடு - நாட்டார் வழக்காற்றியல் ஆய்வு மையம்
           தூய சவேரியார் [தன்னாட்சி] கல்லூரி
           பாளையங்கோட்டை - 627002.
           டிசம்பர் 2000

<div align="center">ஆட்சித்தமிழ்</div>

தகுதிப் புள்ளிகள் - 2   Subject Code- U1TAS41
காலம் - வாரம் - 2 மணிகள்
Contact hours per semester: 30
நோக்கங்கள்
        தமிழின் தொன்மையை உணர்த்துதல்
        தொன்மையான தமிழ் மொழி, ஆட்சி மொழி ஆன வரலாற்றைப் புரிய வைத்தல்
        ஆட்சித்தமிழ் கலைச்சொற்களை அறிமுகம் செய்தல்
பயன்
        ஆட்சித்தமிழாக மாறிய பின்புலம், போட்டித் தேர்வுக்குப் பயனும் பாங்கும் ஆகியவற்றை
அறிந்து கொள்தல்.
கூறு 1   காலம்:6 மணி நேரம்
        தமிழ்மொழி - மொழி - மொழியின் தோற்றம் - தமிழின் தொன்மை - மாந்தரினப் படிவங்கள் -
கற்கருவிகள், உலோகப் பொருட்கள் - பிறமொழிகளில் வழங்கும் தமிழ்ச்சொற்கள் - பிற இனத்தவரோடு
பண்பாட்டு உறவு - தமிழ் வழங்கும் நிலப்பரப்பு - மொழியின் பணியும் பயனும் - மொழி வளர்ச்சி

கூறு 2   காலம்:6 மணி நேரம்
        ஆட்சிமொழி - காலந்தோறும் ஆட்சிமொழி - சட்டமன்ற நிலை - ஆங்கிலேயர் ஆட்சிக்காலம் -
மொழிபெயர்ப்பின் தேவை - தமிழ்ப் பல்கலைக்கழகத்தின் தேவை - மொழிவழி மாகாணம் - சட்டமன்ற
மொழி - கல்வி மொழி

கூறு 3 காலம்:6 மணி நேரம்

சுதந்திரம் அடைந்தபின் உள்ள காலம் - தாய்மொழியின் தேவை - மக்கள் மொழியில் சட்டமன்றம் - பள்ளி, கல்லூரிகளில் வட்டார மொழிகள் - மொழி பெயர்ப்பு - மொழிவழி மிகாமை - ஆட்சித்தமிழ் சட்டம் - விளக்கம் - பயன்.

கூறு 4 காலம்:6 மணி நேரம்

பிற நிலைகள் - இலக்கியம் - இதழ்கள் - கலைக் களஞ்சியங்கள் - அகராதிகள் - போன்றவை - கழகங்கள், சங்கங்கள், இயக்கங்கள் - கருத்தரங்குகள், மாநாடுகள் - ஆட்சித்தமிழ் நிறைவேற்றப் பணிகள் - ஆட்சிமொழி இன்று - உலக நாடுகளில் தமிழ் ஆட்சிமொழி - இந்தியாவில் ஆட்சி மொழி

கூறு 5 காலம்:6 மணி நேரம்

கல்வி மொழி - கல்வியின் நோக்கம் - ஐ.நாவின் கல்விக் கொள்கை - கல்வி ஏற்பாடு - கல்வி சங்க காலத்தில் - சங்ககாலத்திற்குப் பிறகு - ஆங்கிலேயர் ஆட்சிக்காலத்தில் - கல்வி இன்று - கல்வியும் பயிற்சியும் - கல்வியின் முதன்மை நோக்கம் - தாய்மொழிவழிக்கல்வி - அந்நிய மொழி ஆதிக்கம் - முன்னேறிய நாடுகளில் கல்வி மொழி - மூளைவளர்ச்சியும் தாய்மொழியும் - ஆட்சிமொழிக் கொள்கையும் பயிற்று மொழியும் - தமிழ் பயிற்று மொழியும் - தமிழ் பயிற்றுமொழிக்கான தகுதிகள்.

பாடநூல்:

1. இரா. பை. கண்ணகி - 'தமிழ் மொழி ஆட்சிமொழி கல்விமொழி'
   நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிட்,
   41 பி, சிட்கோ இண்டஸ்டிரியல் எஸ்டேட்
   அம்பத்தூர், சென்னை. 600098

பார்வை நூல்

2. புலமை வேங்கடாசலம் - 'ஆட்சிச் சொற்கள் அகராதி'
   தாமரை பப்ளிகேஷன்ஸ் (பி) லிட்,
   41 ந, சிட்கோ இண்டஸ்டிரியல் எஸ்டேட்,
   அம்பத்தூர், சென்னை - 600 098

பத்திரிகைகளும், பத்திரிகைத்தமிழும்

தகுதிப் புள்ளிகள் - 2 Subject Code- U1TAS42

காலம் - வாரம் - 2 மணிகள்

Contact hours per semester: 30

நோக்கங்கள்

1) பத்திரிகையைப் பற்றித் தெரிந்துகொள்ளுதல்
2) பத்திரிகைக்கும், சமூகத்திற்குமான தொடர்பினை அறிதல்
3) பத்திரிகை மொழி மூலம் மாணவரிடையே பத்திரிகை மொழி சார்ந்த அறிவை வளர்த்தல்

பயன்கள்

1) பத்திரிகைகள் மூலம் சமூகமாற்றம் ஏற்படுதல்
2) பத்திரிகைகள் மொழி வளர்ச்சிக்கு உதவியாக இருத்தல்
3) பல்வேறுபட்ட பத்திரிகைகள் குறித்து மாணவர்கள் அறிதல்

கூறு 1 காலம்:6 மணி நேரம்

செம்மையாக்கக் குறியிடுகள் - விளக்கம் - செம்மையாக்க எழுத்துப்படிகளின் வகைகள் - இக்காலத் தமிழ் இதழ்களில் செம்மையாக்கக் குறியீடுகளின் பயன்பாடு

கூறு 2   காலம்:6 மணி நேரம்

அச்சுப்படித் திருத்தமும் குறியீடுகளும் - அச்சுப்படித் திருத்தக்குறியீடுகளின் பிரிவுகள் - மொழிநடையும் திருத்தமும் - இதழியல் மொழிநடை - பிழையில்லாத மொழிநடையமைப்பு - இயந்திரப்பிரிவு.

கூறு 3   காலம்:6 மணி நேரம்

அச்சிடுதலின் நவீனப் போக்குகள் - அச்சுக்கலையின் வரலாறு - அச்சிடும் முறைகள் - அச்செழுத்துக்களின் வகைகள், வதந்திகளின் நோக்கும் போக்கும் - வதந்தியின் பண்புகள், கருத்துப்படங்கள், கேலிச்சித்திரங்கள் - கருத்துப்படங்களின் தோற்றம் - கருத்துப்பட வகைகள் - கருத்துப்பட, கேலிச்சித்திர வேறுபாடுகள்

கூறு 4   காலம்:6 மணி நேரம்

படங்களின் வரலாறு - புகைப்பட இதழியல் - படத்துணுக்குகள் - புலனாய்வு இதழியல் - விளக்கம் - புலனாய்வு இதழியலின் வரலாறு புலனாய்வு இதழியலின் அண்மைப் போக்குகள்

கூறு 5   காலம்:6 மணி நேரம்

தொழில் இதழியல் - தொழில் நிருபர்கள் - செய்தி மூலங்கள் - தொழில் இதழ்களின் உள்ளடக்கம் - வேளாண்மை இதழ்களின் உள்ளடக்கம் - நவீன இதழியல் - இணைய இதழ்கள்

பாடநூல்
இதழியல் பார்வை - முனைவர் வீ. மோகன்
         செல்லப்பா பதிப்பகம், மதுரை,
         ஜனவரி 2007. (மு.ப)

பார்வை நூல்கள்
1) பத்திரிகைத் தமிழ்   -   தங்கமணியன்
2) தமிழ் இதழ்களில் கட்டமைப்புக் கூறுகள்   -   முனைவர் நா. வேலம்மாள்
3) மக்கள் தகவல் தொடர்புக்களங்கள்   -   டாக்டர் மு.முத்தையா
4) இதழியல்   -   ஆ. ராசா

Course Name : M.A

Discipline : Tamil

Sem	Part	Subject	Hour	Credit	Subject Code	Revision
III	Core 10	இலக்கணம் தொல் - பொருள் I	6	5	P1TAC31	No change
	Core 11	காப்பிய இலக்கியம்	6	4	P1TAC32	Revised
	Core 12	ஆய்வு நெறிமுறைகள்	6	4	P1TAC33	New
	Core 13	தமிழ் இலக்கிய வரலாறு	6	4	P1TAC34	Revised
	Elective 2	தமிழ் இலக்கியத்தில் ஆளுமைச் சிந்தனைகள்	6	5	P1TAE31	Revised

Sem	Part	Subject	Hour	Credit	Subject Code	Revision
IV	Core 14	இலக்கணம் தொல் - பொருள் II	6	4	P1TAC41	No Change
	Core 15	பண்டை இலக்கியம்	6	4	P1TAC42	Revised
	Core 16	இந்திய இலக்கியம்	6	4	P1TAC43	Revised
	Core 17	இலக்கியங்களும் இயக்கங்களும்	6	4	P1TAC44	New
	Elective 3	ஆய்வேடு - வாய்மொழித் தேர்வு	6	5	P1TA4PV	No Change

தாள் -10   இலக்கணம் தொல் - பொருள்- I

Contact hours per week :6   Contact hours per semester : 90

Credits :5   Code : P1TAC31

நோக்கங்கள் :

1.அகத்திணையின் வகை தொகைகளை அறிதல்.

2.தமிழரின் புற வாழ்க்கையை அறிதல்.

3.களவியலில் உள்ள மாந்தர்களின் உளப்பாங்கினைத் தெரிதல்.

4.தமிழரின் மண வாழ்வியல் சிறப்பினை உணர்தல்.

5.தமிழரின் அகம் மற்றும் புற வாழ்வியல் சார்ந்த பண்பாட்டை அறிதல்

கூறு : I   காலம்:18 மணி நேரம்

        தொல்-அகத்திணையியல்

கூறு : II   காலம்:18 மணி நேரம்

        தொல்- புறத்திணையியல்

கூறு : III   காலம்:18 மணி நேரம்

தொல்- களவியல்

கூறு : IV   காலம்:18 மணி நேரம்

தொல்-கற்பியல்

கூறு : V   காலம்:18 மணி நேரம்

தொல்-பொருளியல்

பாட நூல்கள் :

01.   தொல்காப்பியம்(பொருள்)   - இளம்பூரணர்
                                          திருநெல்வேலித் தென்னிந்திய சைவ
                                          சித்தாந்த நூற்பதிப்புக் கழகம்,
                                          சென்னை.
                                          பதிப்பு - 1964

02.   தொல்(பொருள்-1)   - தமிழண்ணல்,
                                          மணிவாசகர் பதிப்பகம்,
                                          சிதம்பரம்,
                                          பதிப்பு - 1987

பார்வை நூல்கள் :

01.   தொல்-உரைவளம்   - க.வெள்ளைவாரணர்,
       (புறத்திணையியல்,களவியல்,   பதிப்புத் துறை,
       கற்பியல்,பொருளியல்)   மதுரை காமராசர் பல்கலைக்கழகம்,
                                            மதுரை.

தாள்11: காப்பிய இலக்கியம்

Contact hours per Week : 06   Contact hours per semester: 90
Credits:04   Subject code : P1TAC32

நோக்கங்கள்:

1. தமிழ்க் காப்பிய வரலாற்றினை அறிதல்.
2. தமிழ்க் காப்பியங்களுக்குரிய இலக்கணங்களை ஒப்பிட்டுப் புரிதல்.
3. காப்பியங்களின் கட்டமைப்பை உணர்தல்.
4. சிலம்பு, மேகலையின் படைப்புத் தன்மைகளை அறிதல்.
5. காப்பியம் பிற இலக்கியங்களில் செலுத்தும் செல்வாக்கினை ஆராய்ந்து அறிதல்.

கூறு:1   காலம்:18 மணி நேரம்

      சிலப்பதிகாரம்-   மதுரைக் காண்டம், வஞ்சிக் காண்டம்.

கூறு:2   காலம்:18 மணி நேரம்

மணிமேகலை   -   11-19 காதைகள்
சீவகசிந்தாமணி- குணமாலையார் இலம்பகம்.

கூறு:3   காலம்:18 மணி நேரம்

கம்பராமாயணம்-
(அ) நகரப்படலம்   (ஆ) மிதிலைக் காட்சிப்படலம்
(இ) குகப்படலம்   (ஈ) சூர்ப்பணகைப்படலம்
(உ) சடாயு உயிர்நீத்தபடலம்   (ஊ) நட்பு கோட்படலம்
(எ) விடை கொடுத்தபடலம்   (ஏ) சூளாமணிப் படலம்

கூறு:4   காலம்:18 மணி நேரம்

பெரியபுராணம்   -   இளையாங்குடி மாற நாயனார் புராணம்.
திருவிளையாடற் புராணம்   -   விறகு விற்ற படலம்.

கூறு:5   காலம்:18 மணி நேரம்

சீறாப்புராணம்   -   சல்மான் பாரிசுப் படலம்
இயேசுகாவியம்   -   ஐந்தாம் பாகம்- மகிமை.

பாடநூல்கள்:

01.   கம்பராமாயணம்   - வை.மு.கோபாலகிருஷ்ணமாச்சாரியார்(உரை)
                                உமா பதிப்பகம்,
                                சென்னை - 01.
02.   சீவக சிந்தாமணி   - திருநெல்வேலித் தென்னிந்திய சைவ
                                சித்தாந்த நூற்பதிப்புக் கழகம்,
                                சென்னை.
                                பதிப்பு - 1969
03.   திருவிளையாடற் புராணம்   - திருப்பனந்தாள்ஸ்ரீ காசி மடத்து வெளியீடு,
                                பதிப்பு - 1951
04.   பெரியபுராணம்   - நாராயண வேலுப்பிள்ளை(உரை)
                                வர்த்தமானன் பதிப்பகம்,
                                சென்னை - 17
                                பதிப்பு -
05.   இயேசு காவியம்   - கண்ணதாசன்,
                                கலைக்காவேரி,
                                18 பென்வெல்ஸ் ரோடு,
                                திருச்சி - 01.
                                பதிப்பு - 1985
       பார்வைநூல்கள்:

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01.   காப்பியப் பார்வை   - வ.சுப.மாணிக்கம்,
                                     மணிவாசகர் பதிப்பகம்,
                                     சிதம்பரம்.
                                     பதிப்பு - 1987.

02.   சிலப்பதிகாரம் காட்டும்   - தா.செயப்பிரகாசு,
       தமிழர் சமுதாயநிலை   வான்மழைப் பதிப்பகம்.
                                     வள்ளுவர் கோட்டம்,
                                     சென்னை.
                                     பதிப்பு - 1976.

03.   காவிய காலம்   - எஸ்.வையாபுரிப்பிள்ளை
                                     தமிழ்ப் புத்தகாலயம்,
                                     சென்னை.
                                     பதிப்பு - 1939

தாள்12:ஆய்வு நெறிமுறைகள்

Contact hours per Week : 06   **Contact hours per semester:90**
Credits: 04   **Subject code : P1TAC33**

நோக்கங்கள்:

1. ஆய்வு என்பதன் பொருள் விளங்குதல்.
2. ஆய்வாளர் பண்புகளை உணர்தல்.
3. ஆய்வுக் களங்களை அறிதல்.
4. ஆய்வு அணுகுமுறைகளைத் தெரிதல்.
5. ஆய்வினால் பெறும் பயன்களை உணர்தல்.

கூறு:1   ஆய்வு   காலம்:18 மணி நேரம்

     ஆய்வு - வரையறை - விளக்கம் - வகைகள் - ஆய்வு மொழிநடை, ஆய்வாளர் தகுதிகள், ஆய்வுப்பயன், ஆய்வறம்.

கூறு:2   ஆய்வுத் திட்டமும் படிநிலைகளும்   காலம்:18 மணி நேரம்

     ஆய்வுத் திட்டமிடல், ஆய்வுத் திட்டத்தின் இன்றியமையாமை - தலைப்புத் தெரிவு - சிக்கல் - கருதுகோள் - முதன்மை - துணைமை சார்புத் தரவுகள் -ஆய்வின் பரப்பையும் எல்லையையும் வரையறை செய்தல்.

கூறு:3   ஆய்வு அணுகுமுறை   காலம்:18 மணி நேரம்

மரபுவழி ஆய்வு அணுகுமுறை - ஒப்பீட்டாய்வு அணுகுமுறை - பகுப்பாய்வு அணுகுமுறை - விளக்கவியல் ஆய்வு அணுகுமுறை - அமைப்பியல் ஆய்வு அணுகுமுறை - நாட்டுப்புறவியல் ஆய்வு அணுகுமுறை.

கூறு:4   ஆய்வுத் தகவல் திரட்டல்   காலம்:18 மணி நேரம்

தகவல் திரட்டப் பயன்படும் உத்திகள் - பேட்டி - களஆய்வு முறைகள் - வினாநிரல் - உற்றுநோக்கல் - நூலகப் பயன்பாடு - தனிநிலை ஆய்வு - குறிப்பெடுத்தல் முறை - மூன்றுபடி எடுத்தல்.

கூறு:5   ஆய்வேட்டின் அமைப்பு   காலம்:18 மணி நேரம்

ஆய்வேடு - வடிவமைப்பு - இயல் பகுப்பு - தலைப்பு விளக்கம் - ஆய்வேட்டின் முன்னுரை - உடற்பகுதி - முடிவுரை - சான்றெண் விளக்கம்– அடிக்குறிப்பு - மேற்கோள் - பத்தியமைப்பு - அகரநிரல் - பின்னிணைப்பு - துணைநூற்பட்டியல் - நிறுத்தற்குறியீடுகள் - பிற குறியீடுகள் - கருத்துக்குறியீடுகள்.

பாடநூல்கள்:
01.   ஆய்வியல் நெறிகள்   - முனைவர். கு.வெ.பாலசுப்பிரமணியன்
                                    உமா நூல் வெளியீட்டகம்,
                                    156,சரபோஜி நகர்,
                                    தஞ்சை.04.
                                    பதிப்பு . 2011
02.   ஆய்வியல் அறிமுகம்   - முனைவர். எம்.எஸ்.இலக்குமணன் &
                                    முனைவர் தமிழண்ணல்
                                    செல்லப்பா பதிப்பகம்,
                                    48, தானப்ப முதலி தெரு,
                                    மதுரை.01
                                    பதிப்பு - 1977

பரிந்துரை நூல்கள் :

01.   இலக்கிய ஆராய்ச்சி   - முத்துச்சண்முகம் & சு.வேங்கடராமன்,
       நெறிமுறைகள்   முத்துப் பதிப்பகம்,
                                    மதுரை.
                                    முதற்பதிப்பு - 1980
02.   ஆராய்ச்சி நெறிமுறைகள்   - ச.வே.சுப்பிரமணியன்(பதிப்பு)
                                    உலகத் தமிழாராய்ச்சி நிறுவனம்,
                                    சென்னை.

பதிப்பு - 1983

03.   களஆய்வு   - தே.லூர்த்து,

                               தூய சவேரியர் கல்லூரி,

                               பாளையங்கோட்டை.

பதிப்பு - 1989

தாள்13: தமிழ் இலக்கிய வரலாறு

Contact hours per Week : 06   Contact hours per semester:90

Credits:04   Subject code: P1TAC34

நோக்கங்கள்:

1. சங்க இலக்கியம் முதல் இக்கால இலக்கியம் வரையிலான இலக்கிய வகைகளின் அமைப்பு முறைகளைக் கற்றல்.
2. பல்வேறு இலக்கியப் படைப்பாளரின் படைப்புத் திறனையும், தனித்தன்மையையும் அறிதல்.
3. இலக்கிய வரலாற்றின் பொதுப் போக்குகளை அறிந்து கொள்ளல்.
4. இலக்கியங்களின் வளர்ச்சிப் படிநிலைகளை அறிதல்.
5 .தமிழ் இலக்கியப் பாடுபொருள் மாற்றங்களை அறிதல்.

கூறு :1   காலம்:18 மணி நேரம்

       தமிழ் இலக்கிய காலப் பகுதிகள், சங்க இலக்கியம், சங்க மருவிய இலக்கியம்.

கூறு: 2   காலம்:18 மணி நேரம்

       காப்பிய இலக்கியம், சிற்றிலக்கியம், இலக்கண நூல்கள், உரை நூல்கள்.

கூறு: 3   காலம்:18 மணி நேரம்

       பக்தி இலக்கியம், சித்தர் இலக்கியம், இஸ்லாமியம், கிறித்துவ இலக்கியங்கள்.

கூறு: 4   காலம்:18 மணி நேரம்

       இக்கால இலக்கியம் : மரபுக்கவிதை, புதுக்கவிதை, புதினம்,நாடகம், கட்டுரை, மொழிபெயர்ப்பு இலக்கியங்கள், ஹைக்கூ கவிதைகள், இருபதாம் நூற்றாண்டின் இலக்கிய வளர்ச்சிகள்.

கூறு: 5   காலம்:18 மணி நேரம்

       பிறதுறை இலக்கியங்கள்: நாட்டுப்புற இலக்கியம், பயண இலக்கியம், வாழ்க்கை வரலாற்று இலக்கியம், கடித இலக்கியம், ஒப்பிலக்கியம், திறனாய்வு இலக்கியம்.

பாடநூல்கள்:

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01.   தமிழ் இலக்கிய வரலாறு   - முனைவர் தமிழண்ணல்

சோலை நூலகம்,

சதாசிவநகர்,

மதுரை - 625 002.

முதற்பதிப்பு - 1980

02.   தமிழ் இலக்கிய வரலாறு   - சி.பாலசுப்பிரமணியன்

நறுமலர்ப் பதிப்பகம்,

சென்னை - 29.

முதற்பதிப்பு - 1959

03.   தமிழ் இலக்கிய வரலாறு   - முனைவர்.பாக்கியமேரி.

NCBH வெளியீடு,

சென்னை.

பதிப்பு - 2008

பார்வைநூல்கள்:

01.   தமிழ் இலக்கிய வரலாறு   - மு.வரதராசன்,

சாகித்திய அகாதெமி,

புதுதில்லி.

பதிப்பு - 1978

02.   தென் இந்திய வரலாறு   - கே.கே.பிள்ளை

பழனியப்பா பிரதர்ஸ்,

கோனார் மாளிகை,

14,பிட்டர் சாலை,

சென்னை-14

பதிப்பு -

தமிழ் இலக்கியத்தில் ஆளுமைச் சிந்தனைகள்

(விருப்பப்பாடம்-2)

Contact hours per Week : 06   Contact hours per semester : 90

Credits: 05   Subject code: P1TAE31

நோக்கங்கள்:

1. மனித வாழ்வியலின் ஆளுமைப் பண்புகளை அறிதல்.

2. இலக்கியப் பாத்திரங்களின் ஆளுமையை உணர்தல்.

3. புலவர்களின் ஆளுமைப் பண்புகளை அறிதல்

4. ஆற்றுப்படை இலக்கியங்கள் வெளிப்படுத்தும் வாழ்வியல் விழுமியங்களை உணர்தல்

5. இலக்கியங்களின் வழி புலனாகும் நற்சிந்தனைகளைத் தெரிதல்.

கூறு: 1   காலம்:18 மணி நேரம்

1. எட்டுத்தொகை - குறுந்தொகை, அகநானூறு, புறநானூறு.
2. பத்துப்பாட்டு -சிறுபாணாற்றுப்படை, முல்லைப்பாட்டு, குறிஞ்சிப் பாட்டு,

கூறு: 2   காலம்:18 மணி நேரம்

1. திருக்குறள், நாலடியார்,
2. சிறுபஞ்சமூலம், ஆசாரக்கோவை,
3. இன்னா நாற்பது, இனியவை நாற்பது

கூறு: 3   காலம்:18 மணி நேரம்

1. சிலப்பதிகாரம்   - புகார்க் காண்டம்
2. கம்பராமாயணம் - சுந்தர காண்டம்

கூறு: 4   காலம்:18 மணி நேரம்

1. பாரதியார்   -   கண்ணன் பாட்டு மட்டும்
2. பாரதிதாசன்   -   புரட்சிக்கவி, வீரத்தாய், குடும்ப விளக்கு
கூறு: 5   காலம்:18 மணி நேரம்
1. அப்துல் ரகுமான் - நேயர் விருப்பம்
2. மு.மேத்தா - திருவிழாவில் ஒரு தெருப்பாடகன், காத்திருந்த காற்று.
3. மீரா - ஊசிகள்
4. வைரமுத்து - இந்தப் பூக்கள் விற்பனைக்கு அல்ல.

பாடநூல்கள்
01. எட்டுத்தொகை   - திருநெல்வேலித் தென்னிந்திய சைவ
                                 சித்தாந்த நுற்பதிப்புக் கழகம்,
                                 சென்னை.
                                 பதிப்பு - 1975
02. பத்துப்பாட்டு   - திருநெல்வேலித் தென்னிந்திய சைவ
                                 சித்தாந்த நுற்பதிப்புக் கழகம்,
                                 சென்னை.
                                 பதிப்பு - 1975
03. சிலப்பதிகாரம்   - சாரதா பதிப்பகம்,
                                 ராயப் பேட்டை ,
                                 சென்னை.14
                                 பதிப்பு - 2010

04.   கம்பராமாயணம்   - வை.மு.கோபாலகிருஷ்ணமாச்சாரியார்(உரை)
                                          உமா பதிப்பகம்,
                                          சென்னை - 01.
                                          பதிப்பு -

05.   நேயர் விருப்பம்   - அப்துல் ரகுமான்,
                                          நேஷனல் பப்ளிகேஷர்ஸ்,
                                          2,வடக்கு உஸ்மான் சாலை,
                                          தியாகராய நகர்,சென்னை - 17
                                          பதிப்பு - 2011

06.   திருவிழாவில் ஒரு தெரு   - மு.மேத்தா
      பாடகன்   குமரன் பதிப்பகம்,
                                          தி.நகர்.
                                          சென்னை - 17.
                                          பதிப்பு - 2009

07.   காத்திருந்த காற்று   - மு.மேத்தா
                                          நர்மதா பதிப்பகம்,
                                          தி.நகர்,
                                          சென்னை-17
                                          பதிப்பு - 1989

08.   ஊசிகள்   - மீரா,
                                          1,நிர்மலா நகர்,
                                          தஞ்சை-613 007
                                          பதிப்பு - 2008.

10.   இந்தப் பூக்கள் விற்பனைக்கு   - வைரமுத்து,
      அல்ல   மலர் பதிப்பகம்,
                                          சென்னை-34.
                                          பதிப்பு - 1999.

11.   இராமாயணம்   - வை.மு.கோபாலகிருஷ்ணமாச்சாரியார்(உரை)
                                          உமா பதிப்பகம்,
                                          சென்னை - 01.
                                          பதிப்பு -

பார்வை நூல்கள்

01.   வெற்றி தரும் ஆளுமை ஆற்றல்   - நர்மதா பதிப்பகம்
                                          தி.நகர்,
                                          சென்னை-17
                                          பதிப்பு -

                        தாள் -14   இலக்கணம் தொல் - பொருள்- II

Contact hours per week : 6	*Contact hours per semester : 90*
Credits: 4	*Code : P1TAC41*

நோக்கங்கள் :

1.செய்யுள் உறுப்புகளை இனம் காணல்.
2.பா வகை, தொகைகளை விளங்குதல்.
3.உவமையின் வகைகளையும் தன்மைகளையும் அறிதல்.
4.எண் வகை மெய்ப்பாடுகள் குறித்துத் தெரிதல்.
5.தமிழர்களின் மரபுப் பெயர்களை இனம் காணுதல்.

கூறு: I   காலம்:18 மணி நேரம்

தொல், யாப்பருங்கலக்காரிகை கூறும் செய்யுள் உறுப்புகள் -எழுத்து, அசை, சீர், தளை, அடி, தொடை வகைகள், வண்ணம், வனப்பு

கூறு : II   காலம்:18 மணி நேரம்

தொல், யாப்பருங்கலக்காரிகை கூறும் நான்கு வகை பாக்கள்

கூறு : III   காலம்:18 மணி நேரம்

தொல் - உவமையியல், தண்டியலங்காரம் -அணி இலக்கணம் (வகைகள்)
நிங்களாக

கூறு : IV
                                                           காலம்:18 மணி நேரம்
தொல் - மெய்ப்பாட்டியல்

கூறு : V   காலம்:18 மணி நேரம்
தொல் - மரபியல்

பாட நூல்கள் :

01.	தொல்காப்பியம்	- இளம்பூரணர் உரை, திருநெல்வேலித் தென்னிந்திய சைவ சித்தாந்த நுற்பதிப்புக் கழகம், சென்னை. பதிப்பு - 1964
02.	தொல்(பொருள்-II)	- தமிழண்ணல்,

		மணிவாசகர் பதிப்பகம்,
		சிதம்பரம்.
		பதிப்பு-1987
03.	யாப்பருங்கலம்	- தமிழண்ணல்,
		மீனாட்சி புத்தக நிலையம்,
		மதுரை.
		பதிப்பு -
04.	தண்டியலங்காரம்	- தமிழண்ணல்,
		மீனாட்சி புத்தக நிலையம்,
		மதுரை
		பதிப்பு -

தாள் :15   பண்டை இலக்கியம்

Contact hours per Week : 06   Contact hours per semester: 90
Credits: 04   Subject code: P1TAC42

நோக்கங்கள்:

1. சங்க இலக்கிய மொழிநடையின் தன்மையை அறிதல்.
2. சங்க கால தமிழரின் வாழ்க்கை முறையை அறிதல்.
3. சங்க கால மன்னர்களின் போர்நெறியைத் தெரிதல்.
4. பழந்தமிழரின் அரசியல்,சமூக வாழ்வியலை அறிதல்.
5. திணை, துறை பற்றிய செய்திகளை அறிதல்.

கூறு:1   காலம்:18 மணி நேரம்

(அ) புறநானூறு
              (i)   கபிலர் பாடல்கள்   (9)

01.	வையம் காவலர்	- 08	02.	கடுங்கண்ண கொல்களிற்றால்	- 14
03.	சேயிழை பெறுகுவை	- 105	04.	நல்லவும் தீயவும்	- 106
05.	பாரி பாரி என்று	- 107	06.	குறத்தி மாட்டிய	- 108
07.	அளிதோ தானே பாரியது பறம்பே	- 109	08.	கடந்தடு தானை	- 110
09.	அளிதோ தானே பேரிருங் குன்றே	- 111			

              (ii)   ஒளவையார் பாடல்கள் (18)

01.	களம்புகல் ஓம்புமின்	- 8	02.	யாவிர் ஆயினும்	- 88

03.	இழையணிப் பொலிந்த	- 89	04.	உடைவளை கடுப்ப மலர்ந்த	- 90
05.	வலம்படு வாய்வாள்	- 91	06.	யாழொடும் கொள்ளா	- 92
07.	திண்பிணி முரசம்	- 93	08.	ஊர்க்குறு மாக்கள்	- 94
09.	இவ்வே பீலி அணிந்து	- 95	10.	அலர்பூந்தும்பை	- 96
11.	போர்க்குரை இப்புகன்று	- 97	12.	முன்னத்தெவ்வர்	- 98
13.	அமரர்ப் பேணியும்	- 99	14.	கையது வேலே	- 100
15.	ஒருநாள் செல்லலாம்	- 101	16.	எருதே இளைய	- 102
17.	ஒரு தலைப்பதலை	- 103	18.	போற்றுமின் மறவீர்	- 104

(iii)   பெருங்குன்றூர் கிழார் பாடல்கள் (2)

01.	மன்பதை காக்கும்	- 210
02.	அஞ்சுவடு மரபின்	- 211

(ஆ) பதிற்றுப்பத்து - ஏழாம்பத்து

செல்வக்கடுங்கோ வாழியாதனைக் கபிலர் பாடியது.

கூறு: 2   காலம்:18 மணி நேரம்

(அ) குறுந்தொகை - நெய்தல் திணைப் பாடல்கள் (20)

01.	நோம் என் நெஞ்சே	- 04	02.	அதுகொல்,தோழி!காமநோயே	- 05
03.	நள்ளென்றன்றே,யாமம்	- 06	04.	யாய் ஆகியனே	- 09
05.	அணிற்பல் அன்ன	- 49	06.	கூன்முள் முண்டக	- 51
07.	மார்கழி மணிப்பூக் கூம்ப	- 55	08.	பூ இடைப்படினும்	- 57
09.	ஞாயிறுபட்ட அகல்	- 92	10.	யானே ஈண்டையேனே	- 97
11.	உள்ளின் உள்ளம்	- 102	12.	கடும்புனல் தொடுத்த	- 103
13.	முட்கால் இறவின் முடங்குடி	- 109	14.	நெய்தல் பரப்பில் பாவை	- 114
15.	மாரி ஆம்பல்	- 117	16.	புள்ளும் மாவும்	- 118
17.	பைங்காற் கொக்கின்	- 122	18.	இருள் திணிந்தன்ன	- 123
19.	இலங்குவளை நெகிழச்சாய்	- 125	20.	குணக்கடல் திரையது	- 128

(ஆ) ஐங்குறுநூறு - குறிஞ்சித் திணைப் பாடல்கள் (இரண்டு பத்துக்கள்)

1. அன்னாய் வாழிப்பத்து
2. அன்னாய்ப்பத்து

(இ) கலித்தொகை - பாலைக்கலி (முதல் 3பாடல்கள்)

1. தொடங்கற்கன் தொன்றிய முதியவன்......................
2. அறன் இன்றியயல் ....
3. வலி முன்பின் வல்லென்ற யாக்கை ....

கூறு:3   காலம்:18 மணி நேரம்

(அ) அகநானூறு

மருதத்திணைப் பாடல்கள் - 5 (6,16,26,36,46)

01. அரிபெய் சிலம்பின்	- 06	02. நாயுடை முதுநீர்	- 16
03. கூன்முள் முள்ளி	- 26	04. பகுவாய் வராஅல் பல்வரி	- 36
05. செற்றுநிலை மூனைஇய	- 46		

(ஆ) பரிபாடல்

10. வையை பற்றியது (புதுப்புனல் வந்தது)

(இ) நற்றிணை

மூல்லைத்திணைப் பாடல்கள்

01. விரைப்பாரி வருத்திய	- 21	02. மறுத்தற்கு அரிதால் பாக !	- 42
03. உடும்பு கொலீஇ வரிநுணல்	- 59	04. பல்கதிர் மண்டிலம்	- 69
05. இருநிலங் குறையக் கொட்டி	- 81		

கூறு: 4   காலம்:18 மணி நேரம்

பட்டினப்பாலை (முழுவதும்)

கூறு:5   காலம்:18 மணி நேரம்

நெடுநல் வாடை (முழுவதும்)

பாடநூல்கள்:

01. எட்டுத்தொகை   - திருநெல்வேலித் தென்னிந்திய சைவ சித்தாந்த நூற்பதிப்புக் கழகம், சென்னை.
பதிப்பு - 1975

02. பத்துப்பாட்டு   - திருநெல்வேலித் தென்னிந்திய சைவ சித்தாந்த நூற்பதிப்புக் கழகம், சென்னை.
பதிப்பு - 1975

தாள் -16   இந்திய இலக்கியம்

Contact hours per Week : 6

Contact hours per semester:90

Credits: 4

Subject code:P1TAC43

நோக்கங்கள்:

1. இந்தியாவிலுள்ள பிறமொழி எழுத்தாளர்களின் படைப்புகளை அறிதல்.
2. பிற மொழி இலக்கியங்களில் உள்ள கதைக் களத்தை அறிதல்.
3. பிற மொழிப் படைப்பாளர்களின் கதைப் போக்கை ஆராய்ந்து உணர்தல்.
4. பிற மொழிப் படைப்பாளர்கள் கதைக்கருவிற்கு எங்ஙனம் உருவம் கொடுத்துள்ளனர் என்பதையறிதல்.
5. பிற மொழிப் படைப்புகளில் உள்ள கதாப்பாத்திரங்களின் பன்பையறிதல்.

கூறு 1:   சிறுகதை   காலம்:18 மணி நேரம்

i கதாபாரதி தெலுங்குச் சிறுகதைகள் (15 கதைகள் மட்டும்)

01. பாசம்	02. படகுப் பயணம்
03. தோஷ காய்ச்சல்	04. வருத்தம் இல்லை
05. மா மரம்	06. ஆசைக் கதிர்
07. இயந்திர மனிதன்	08. காக்கைகள்
09. சுக முடிவு	10. காலி புட்டிகள்
11. தேங்க்ஸ் ஃபார் தி பி.எம்	12. நோ ரூம்
13. கல்யாணிப் புறப்பாடு	14. ஆல நிழலும் மல்லிக் கொடியும்
15. காணிக்கை	

ii. நட்சத்திரம் விழும் நேரத்தில் - மலையாளம்
(தமிழில் - உதயசங்கர்).

கூறு:-2   புதினம்   காலம்:18 மணி நேரம்
1. வானம் முழுவதும் (இந்தி)இராஜேந்திர யாதவ் தமிழில் - மு.ஞானம்
2. காகித மாளிகை (தெலுங்கு) முப்பாள ரங்கநாயகம் -
   தமிழில் பா.பாலசுப்பிரமணியன்

கூறு:-3   நாடகம்   காலம்:18 மணி நேரம்
1. நாகானந்தம் (வடமொழி) ஹர்ஷவர்த்தனா - தமிழில் - அ.அய்யாசாமி
2. மகாநிர்வாணம் (மராத்தி) சதிஷ் அலேகர்   -தமிழில் - கே.வி.ராமசாமி
3. யயாதி (கன்னடம்) கிரிஷ் கர்னாட் - தமிழில் பாவண்ணன்

கூறு:-4   கவிதை   காலம்:18 மணி நேரம்

1. மஞ்சள் வயலில் வெறி பிடித்த தும்பிகள்

   (ஒரியா) மனோரமா பிஸ்வால் மஹபத்ரா : தமிழில் - இந்திரன்

2. வித்யாபதியின் காதற் கவிதைகள் (இந்தி) தமிழில் - பாலா

கூறு:-5   சுய சரிதை   காலம்:18 மணி நேரம்

1. வினயா (மலையாளம்)   -   தமிழில் குளச்சல் மு.யூசுப்

2. விடியலை நோக்கி (வங்காளம்)பேபி ஹால்தார் - தமிழில் எம்.எஸ்

பாட நூல்கள்:

01. கதாபாரதி தெலுங்கு   - பி.பாலசுப்பிரமணியன் (தமிழாக்கம்)
     சிறுகதைகள்   நேஷனல் புக் டிரஸ்ட் இந்தியா.
                                      புது தில்லி.
                                      பதிப்பு: 1973

02. நட்சத்திரம் விழும் நேரத்தில்   - கிரேஸி (மலையாளம்) உதயசங்கர் (தமிழ்)
                                      வாசல்,
                                      முதல் தெரு, வசந்தநகர்,
                                      மதுரை.
                                      பதிப்பு - 2011

03. அக்னியும் மழையும்   - கிரீஷ் கர்னாட்(கன்னடம்)
                                      பாவண்ணன் (தமிழ்)
                                      காலச்சுவடு பதிப்பகம்,
                                      நாகர் கோவில்.
                                      பதிப்பு -

04. வானம் முழுவதும்   - ராஜேந்திர யாதவ் (இந்தி)
                                      மு.ஞானம் (தமிழ்)
                                      நேஷனல் புக் டிரஸ்ட் இந்தியா
                                      புது தில்லி.
                                      பதிப்பு -1997

05. காகித மாளிகை   - மூப்பால ரங்கநாயகம் (தெலுங்கு)
                                      பா.பாலசுப்பிரமணியன் (தமிழ்)
                                      நேஷனல் புக் டிரஸ்ட் இந்தியா,
                                      புது தில்லி.
                                      பதிப்பு - 1970

06. நாகானந்தம்   - பேரரசர் ஹர்ஷவர்த்தனர் (வடமொழி)
                                      அ.அய்யாசாமி   (தமிழ்)
                                      விழிகள் பதிப்பகம்
                                      திருவான்மியூர், சென்னை-41
                                      பதிப்பு: 2007

07. மகா நிர்வாணம்   - சதீஷ் அலேகர்   (மராத்தி)
                                      கே.வி.ராமசாமி (தமிழ்)
                                      தமிழினி, ராயப்பேட்டை,
                                      சென்னை

பதிப்பு: 2001

08. மஞ்சள் வயலில் வெறி பிடித்த   - மனோரமா பிஸ்வால் மஹபத்ரா(ஒரியா)
து2ம்பிகள்   கனவுப் பட்டறை,

ஜி.என்.செட்டி ரோடு,

சென்னை-6

பதிப்பு: 2003

09. வித்யாபதியின் காதற் கவிதைகள் - வித்யாபதி (இந்தி)

பாலா (தமிழ்)

கவிதா பப்ளிகேஷன், தி.நகர்,

சென்னை.

பதிப்பு: 2006

10. வினயா   - வினயா (மலையாளம்)

குளச்சல் மு.யூசுப் (தமிழ்)

எதிர் வெளியீடு,

காவல் நிலையம் சாலை,

பொள்ளாச்சி.

பதிப்பு: 2007

11. விடியலை நோக்கி   - பேபி ஹால்தார் (வங்காளம்)

காலச்சுவடு,

தமிழில் எம்.எஸ்

நாகர்கோவில்.

பதிப்பு: 2007

தாள்:17 இலக்கியங்களும் இயக்கங்களும்

Contact hours per Week :06   Contact hours per semester:90

Credits:04   Subject code:P1TAC44

நோக்கங்கள்:

1. இலக்கியங்களை இயக்கங்களின் அடிப்படையில் புரிந்து கொள்ளல்.
2. இலக்கியம் வழி இயக்கங்கள் அடைந்த வளர்ச்சி நிலையினையறிதல்.
3. இயக்கங்களின் வழி அறியலாகும் சமூக, பொருளாதார, அரசியல் மாற்றங்களையறிதல்.
4. பெண்ணுரிமைச் சிந்தனையில் இயக்கங்களின் பங்கினை அறிதல்
5. புதிய இயக்கங்களைத் தெரிதல்.

கூறு:1   காலம்:18 மணி நேரம்

இயக்கம் - விளக்கம்-வகைகள் - காலந்தோறும் இயக்கங்கள் - சங்கம் - நீதி - சமயம் - தேசியம் - தனித்தமிழ் - திராவிடம் - மார்க்சியம்.

நவீன இயக்கங்கள்: பெண்ணியம் - காந்தியம் - தலித்தியம் - நவீனத்துவம் - பின்நவீனத்துவம் - நடப்பியல் - படிமவியல் - உருவவியல் - அமைப்பியல் -அழகியல்.

கூறு:2   சமயப்பூசலும் - பக்தி இயக்கமும்   காலம்:18 மணி நேரம்

சிலப்பதிகாரம்	- காடுகாண் காதை (11 முதல் 161அடிகள் வரை)
மணிமேகலை	- மலர்வனம் புக்ககாதை (85 முதல் 103 அடிகள் வரை)
திருமங்கையாழ்வார்	- சிறிய திருமடல் (முதல் 15 அடிகள் மட்டும்)
குலசேகர ஆழ்வார்	- பெருமாள் திருமொழி (நான்காம் பத்து)
திருஞானசம்பந்தர்	- தேவாரம் (கோளறு பதிகம் மட்டும்)

சமரச சன்மார்க்கம்

| வள்ளலார் | - திருவருட்பா |
| | (அனுபவ மாலை - முதல் 5 பாடல்கள் மட்டும்) |

கூறு:3   காலம்:18 மணி நேரம்

(அ) தேசிய இயக்கம்

பாரதியார் - தேச பக்திப் பாடல்கள்

01.	வந்தேமாதரம்	- வந்தேமாதரம் என்போம்
02.	நாட்டு வணக்கம்	- தந்தையும் தாயும்
03.	பாரத நாடு	- பாருக்குள்ளே
04.	பாரத தேசம்	- பாரத தேசம் என்று
05.	எங்கள் நாடு	- மண்ணும் இமயமலை
06.	பாரத மாதா	- முன்னை இலங்கை
07.	எங்கள் தாய்	- தொன்று நிகழ்ந்த
08.	வெற்றி கொண்ட தாய்	- பேய் அவன் காண்

(ஆ) தனித்தமிழ் இயக்கம்
   i. பாரதிதாசன் - தமிழியக்கம்
   ii. முடியரசன் - பூங்கொடி காவியம்
            (சொற்போர் நிகழ்த்திய காதை மட்டும்)

கூறு:4   காலம்:18 மணி நேரம்

(அ) திராவிட இயக்கம்

| 1. அறிஞர் அண்ணா | - தீ பரவட்டும் |
| 2. முனைவர் இ.கி.இராமசாமி | - திராவிட இயக்கச் சிந்தனைகள் |

   01. தந்தை பெரியாரும் பெர்ட்ரண்டு ரசலும்
   02. தடையும் தடைவிலக்கலும்
   03. பாவாணரும் பாரதிதாசனும்
   04. தமிழண்ணலின் பகுத்தறிவுப் பார்வை

05. கலைஞர் மு.கருணாநிதியின் இதழியல் உத்தி

3. திராவிடப் பாடல்கள்

01. அச்சம் என்பது மடமையடா
02. தீனா மூனா கானா
03. எங்கள் திராவிட பொன்னாடே
04. மணமாலை இழந்த தாயே
05. மனிதர்கள் சமமே என்று சொல்வோம்

ஆ) மார்க்சிய இயக்கம்

பட்டுக்கோட்டையார் பாடல்கள்

01. தூங்காதே தம்பி தூங்காதே
02. செய்யும் தொழிலே தெய்வம்
03. படிப்புத் தேவை அதோடு உழைப்பும் தேவை
04. திருடாதே! பாப்பா திருடாதே!
05. எல்லோரும் இந்நாட்டு மன்னரே - நாம்

இ) காந்தியம்

மகாத்மா காந்தி - கடிதங்கள் சகோதரிகளுக்கு

01. தர்மம்
02. தொண்டில் ஈடுபாடு
03. நகைகள் அவசியமா?
04. சேவையிலும் பகட்டா?
05. வேலையைப் பூரணமாகச் செய்யுங்கள்

கூறு:5   காலம்:18 மணி நேரம்

அ) பெண்ணுரிமை இயக்கம்

1. தந்தை பெரியார்   - பெண் ஏன் அடிமையானாள்
2. திரு.வி.க.   - பெண்ணின் பெருமை அல்லது வாழ்க்கைத்துணை நலம்

ஆ) தலித்திய இயக்கம்
இளைசை சுந்தரம்   - சாதகப்பறவைகள்

01. பலியாடுகள்
02. கன்மாய் அழிகிறது
03. வெள்ளைச்சாமி மனிதனாகிய போது
04. ஊட்டு

பாட நூல்கள்:
01. திறனாய்வுக் கலை   - தி.சு.நடராஜன்
நியு செஞ்சுரி புக் ஹவுஸ்,
அம்பத்தூர்
சென்னை-600 098
பதிப்பு - 2011
02. சாதகப் பறவைகள்   - இளைசை சுந்தரம்
நியு செஞ்சுரி புக் ஹவுஸ்,

அம்பத்தூர்

செ்ன்னை-600 098

பதிப்பு -2010

03. திராவிட இயக்கச் சிந்தனைகள் - முனைவர் இ.கி.இராமசாமி

செல்லப்பா பதிப்பகம்

மதுரை-625 001

பதிப்பு - 2009

04. தீ பரவட்டும் - அறிஞர் அண்ணா

திராவிடர் கழக வெளியீடு

செ்ன்னை-600 007.

6ஆம்பதிப்பு - 2011

05. பெண் ஏன் அடிமையானாள்? - தந்தை பெரியார்

பெரியார் சுயமரியாதைப் பிரச்சார நிறுவன வெளியீடு

செ்ன்னை-600 007

27ஆம் பதிப்பு-2011

06. பட்டுக்கோட்டையார் - பட்டுக்கோட்டையார் பாடல்கள்

கற்பகம் புத்தகலாயம்,

4/2 சுந்தரம் தெரு,

செ்ன்னை-600 017

பதிப்பு-2012

07. பூங்கொடி (காவியம்) - முடியரசன்

சீதை பதிப்பகம்,

17/1 தாச்சி அருணாச்சலம் தெரு,

மயிலை,செ்ன்னை-4.

பதிப்பு-2008

08. கடிதங்கள் சகோதரிகளுக்கு - மகாத்மா காந்தி,

தமிழ்நாடு காந்தி நினைவு நிதி,

மதுரை.

பதிப்பு - 1964

பார்வை நூல்கள்:

01. இலக்கிய இயக்கங்களும் - சு.பாலச்சந்திரன்,
  திறனாய்வு   கோமதி நூலகம்,

474, முதல் முதன்மைவீதி,

திருவான்மியூர்,

செ்ன்னை-41.

பதிப்பு -

02. இலக்கிய இயக்கங்கள் - சிவ.மங்கையர்க்கரசி

நியு செஞ்சுரி புக் ஹவுஸ்,

அம்பத்தூர்

சென்னை - 600 098

பதிப்பு -

ஆய்வேடு - வாய்மொழித்தேர்வு

(விருப்பப்பாடம் -3)

Contact hours per Week : 06

Credits: 05

Contact hours per semester:90

Subject code: P1TA4PV

முதுகலை மாணவர்கள் நான்காம் பருவத்தேர்வின் ஒரு பகுதியாக / தாளாக ஒர் ஆய்வுத் திட்டக்கட்டுரை ஏடு எழுதி அளித்தல் வேண்டும்.

இவ்ஆய்வேடு கணிப்பொறி அச்சு உருவாக்கத்தில் 60 பக்கங்களுக்குக் மிகாமல் புதிய ஆய்வுச் செய்திகளைத் தாங்கியதாக இருத்தல் வேண்டும்.

ஒவ்வொரு மாணவரின் ஆய்வுத்திட்டக் கட்டுரைக்கும் ஆசிரியர் ஒருவர் வழிகாட்டியாக அமைவர்.

ஆய்வுக் கட்டுரை ஏட்டினை நான்காம் பருவ இறுதித்தேர்விற்கு முன்னதாக அளித்தல் வேண்டும்.

இவ்ஆய்வேட்டிற்கு அக மதிப்பெண் மற்றும் புற மதிப்பெண் வழங்கப்பெறும். அக மதிப்பெண்:25 புற மதிப்பெண்:75 (மொத்த மதிப்பெண்கள்=100)

Course Name: Part II English

Discipline   : English

Rules and regulations, Course Scheme and Scheme of Examinations
(For those who joined in June 2012 and after)

1. Course Objectives:

The objectives of Part II English are to enable the students to

i.   develop an understanding of and competence in Spoken and Written English

ii. Communicate fluently and accurately with other speakers of English

iii. read, appreciate and enjoy literary texts.

2.Eligibility for admission:

Students doing II year undergraduate courses

3. Duration of the Course:

The subject shall be offered during the third and fourth semesters with one Examination at the end of each semester.

4. Course Scheme

Semester	Subject	Hours	Credits	Sub. code	
I	Paper I – Prose, Short Story, Grammar and Composition	6	3	U1PE11	
II	Paper II – Prose, Short Story, Grammar and Composition	6	3	U1PE21	
III	Paper III – Poetry, One-Act Play, Communicative English	6	3	U1PE31	Revised
IV	Paper IV – Fiction, Drama & Communicative English	6	3	U1PE41	Revised

5. Detailed Syllabus for each paper for II year

SYLLABUS FOR PART II ENGLISH
Common to all the UG Degree Courses: B.A./B.Sc.

(For those who joined in June 2012 and after)

III SEMESTER   Paper III : Poetry, One Act Plays, Communicative English

Contact Hours per Week: 6
Contact Hours per Semester: 90
Credits: 3   **Subject Code : U1PE31**
Objectives

    i. To equip the students to read and appreciate poetry.

    ii. To understand the character portrayal and dramatic devices.

    iii. To improve the communication skills of the students in English.

UNIT I : Poetry I: **(15 Hours to complete this unit)**
    1. Oliver Goldsmith   - The Village Schoolmaster
    2. William Wordsworth   - The Solitary Reaper
    3. Walter Scott   - Lochinvar
    4. Walt Whitman   -O, Captain, My Captain!

UNIT II : Poetry II: **(15 Hours to complete this unit)**
    1. Longston Hughes   - The Negroes Speak of Rivers
    2. Nissim Ezekiel   - Very Indian Poem in Indian English
    3. A. D. Hope   - Australia
    4. Kamala Das   - Advice to Fellow-swimmers

UNIT III : One – Act Plays: **(30 Hours to complete this unit)**
    1. A Marriage Proposal   - Anton Chekhov
    2. The Rising of the Moon - Lady Gregory
    3. Re-union   - W. S. John Tayler
    4. Never-never Nest   - Cedric Mount

UNIT IV: Communicative English :   **(15 Hours to complete this unit)**
    1. Communicating by letters - Unit 1 & 2
    2. Different ways of presenting information Unit 7 & 8

UNIT V : Communicative English :   **(15 Hours to complete this unit)**
    1. Description and narration - Unit No 13 & 14
    2. Reporting - Unit No 25 & 26

TEXT BOOKS

1. **Eternal Echoes** ed. Dr. Ganesan Balakrishnan SCITECH Publication, Chennai.
2. **A Book of Plays** Compiled by A Group of Editors, Orient Blackswan, Chennai.
3. **Written Communication in English.** Sarah Freeman, Orient Blakswan, Chennai.

SYLLABUS FOR PART II ENGLISH
Common to all the UG Degree Courses: B.A./B.Sc.
(For those who joined in June 2011 and after)

SEMESTER IV   Paper IV – Fiction, Drama & Communicative English

Contact Hours per Week: 6
Contact Hours per Semester: 90
Credits: 3   **Subject Code : U1PE41**

Objectives
   i. to introduce the well known novel for reading extensively
   ii. to make the students aware of dramatic techniques and the art of characterization.
   iii. to enable the students to read and write and comprehend the idea and express
        themselves freely in English.

UNIT I & II: Fiction :   **(30 Hours to complete this unit)**

        George Eliot   - Silas Marner (Abridged)

UNIT III & IV : Drama :   **(30 Hours to complete this unit)**

        Bernard Shaw   - Pygmalion

UNIT V : Communicative English :   **(30 Hours to complete this unit)**

        1. Arguing   Unit No: 33, 34, 35, 36
        2. Expressing yourself   Unit No: 39, 40, 42

TEXT BOOKS

1. **Silas Marner.** George Eliot, Macmillan, Chennai.
2. **Pygmalion.** Bernard Shaw, Macmillan, Chennai.
3. **Written Communication in English.** Sarah Freeman, Orient Blackswan, Chennai.

Course Name: B. A. English Literature

Discipline   : English

Rules and regulations, Course Scheme and Scheme of Examinations
(For those who joined in June 2012 and after)

1. Course Objectives:

The objectives of the B. A. Degree Course in English are

i. to develop a strong foundation in literature, literary theories and criticism

ii. to acquire knowledge about various literary genres

iii. to enjoy and appreciate the literary works of great writers with critical insights

2. Eligibility for admission:

A pass in the Higher Secondary Course or its equivalent as per Madurai Kamaraj University rules.

3. Duration of the Course:

The course shall extend over a period of three years comprising of six semesters with two semesters in one academic year. There shall not be less than 90 working days for each semester.

4. Course Scheme

Semester	Part	Subject	Hour	Credit	Sub. Code	Revision
III	Part I	Tamil / Hindi	6	3	U1PT31/ U1PH31	Revised
	Part II	English	6	3	U1PE31	Revised
	Core 5	Drama	5	4	U1ENC31	Revised
	Core 6	Fiction	5	4	U1ENC32	Revised
	Allied 3	Literary Forms	6	5	U1ENA31	No Change
	SBE- I	English Online	2	2	U1ENS31	New
Semester	**Part**	**Subject**	**Hour**	**Credit**	**Sub. Code**	**Revision**
	Part I	Tamil / Hindi	6	3	U1PT31/ U1PH31	Revised
	Part II	English	6	3	U1PE31	Revised
	Core 7	Shakespeare	4	4	U1ENC41	Revised

IV						
	Core 8	American Literature	4	4	U1ENC42	Revised
	Allied 4	Literary Criticism	6	5	U1ENA41	Revised
	SBE-2	Introduction to Soft-Skills	2	2	U1ENS41	New
	SBE-3	Reading and Writing Skills	2	2	U1ENS42	New

THIRD SEMESTER

CORE SUBJECT – PAPER –V   DRAMA

Contact Hours per week: 5
Contact Hours per semester: 75
Credits: 4   **Subject Code: U1ENC31**
Objectives

    i. to introduce well known dramatists.

    ii. to encourage the students to read Elizabethan and Restoration plays.

    iii. to assess and analyse the literary qualities and aesthetics of drama

UNIT – I   **(15 Hours to Complete this unit)**

    Christopher Marlowe   - Tamburlaine - Part I

UNIT –II   **(15 Hours to Complete this unit)**

    Ben Jonson   – The Alchemist

UNIT –III   **(15 Hours to Complete this unit)**

    John Webster   – The Duchess of Malfi

UNIT- IV   **(15 Hours to Complete this unit)**

    Sheridan   – The Rivals

UNIT – V   **(15 Hours to Complete this unit)**

    John Dryden   – All for Love

Books Recommended for Study:

1. **The Life of the Drama.** Eric Bently
2. **English Drama.** Stanley Wells.
3. **The Anatomy of Drama** Marjorie Boulton
4. **British Drama.** Allardyce Nicoll.

THIRD SEMESTER

CORE SUBJECT – PAPER – VI   FICTION

Contact Hours per Week: 5
Contact Hours per Semester: 75
Credits: 4   **Subject Code: U1ENC32**
Objectives

    i. to make the students read and appreciate the literary form - novel

    ii. to examine the art of characterization, plot and theme

    iii. to make the students comprehend the devices and techniques used

UNIT – I   **(15 Hours to complete this unit)**

    Henry Fielding   – Robinson Crusoe

UNIT – II   **(15 Hours to complete this unit)**

    Jane Austen   – Emma

UNIT-III   **(15 Hours to complete this unit)**

    Charlotte Bronte   – Jane Eyre

UNIT – IV   **(15 Hours to complete this unit)**

    Charles Dickens   – Hard Times

UNIT – V   **(15 Hours to complete this unit)**

    D. H. Lawrence   – Sons and Lovers

Books Recommended for study

1. **The Novel in English: An Introduction.** Ian Milligan
2. **The History of the English Novel.** Ernest. A. Barker
3. **The Novel Now – Contemporary British Fiction.** Richard Bradford
4. **The Modern Novel:** Vijay K. Chopra

THIRD SEMESTER
ALLIEDL SUBJECT - PAPER III – LITERARY FORMS

Contact Hours per Week: 6
Contact Hours per Semester: 90
Credits: 5   **Subject Code: U1ENA31**
Objectives

    i. to have a comprehensive study of the literary forms in English literature

    ii. to study the literary texts with generic divisions.

UNIT – I   **(18 Hours to complete this unit)**

    Poetry, (Epic, Elegy, Sonnet, Ode)

UNIT II   **(18 Hours to complete this unit)**
    Essay and Criticism
UNIT III   **(18 Hours to complete this unit)**
    Short story
    Biography
    Autobiography
UNIT IV   **(18 Hours to complete this unit)**
    Plays (Comedies and Tragedies)
    Shakespeare's Plays
    One – Act Play
UNIT V   **(18 Hours to complete this unit)**
    The Novel (Different types)

Book Prescribed for study:
    1.**Literary Forms:** K. R. Ramachandran Nair: Emerald publishers, Chennai
Books recommended for study
1. **An Introduction to English Literature,** R. J. Rees: Macmillan, Chennai
2 **. A Background to The Study of English Literature,**   B. Prasad : Macmillan, New Delhi
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THIRD SEMESTER
SKILL BASED ELECTIVE PAPER I – ENGLISH ONLINE

Contact Hours per Week: 2
Contact Hours per Semester: 30
Credits: 5   **Subject Code: U1ENS31**

Objectives
    i. to have a comprehensive study of English online
    ii. to study the use of websites in learning English
    iii. to learn the use of computers in learning English language
UNIT – I   **(6 Hours to complete this unit)**
    Once a Wonder Now a Curiosity
UNIT II   **(6 Hours to complete this unit)**
    The Birth of the Internet
UNIT III   **(6 Hours to complete this unit)**
    Cutting Across Boundaries
UNIT IV   **(6 Hours to complete this unit)**

Web Doctors

UNIT V   (**6 Hours to complete this unit**)
    The Seventh Continent

Text Book

    English Online: Communication for Information Technology Jayashree Mohanraj and S. Mohanraj. Orient Longman,Hyderabad, 2001.

FOURTH SEMESTER

CORE SUBJECT– PAPER VII SHAKESPERE

Contact Hours per Week: 4
Contact Hours per Semester: 60
Credits: 5   **Subject Code: U1ENC41**

Objectives

    i. to have a comprehensive study of the plays of Shakespeare
    ii. to study the literary texts with the social background of England
    iii. to learn the different types of Shakespeare's Plays

UNIT – I   **(12 Hours to complete this unit)**
    King Lear

UNIT II   **(12 Hours to complete this unit)**
    A Mid Summer Night's Dream

UNIT III   **(12 Hours to complete this unit)**
    Julius Caesar

UNIT IV   **(12 Hours to complete this unit)**
    The Tempest

UNIT V   **(12 Hours to complete this unit)**
    Elizabethan theatre and Audience
    Opening Scenes
    Fools
    Villains
    Women

Books Recommended for Study

    1. **Some Shakespearean Themes**. L.C. Knight
    2. **Shakespeare Criticism.** Anne Ridler
    3. **Introducing Shakespeare** Harrison
    4. **The Shakespearean Scene.** Patrick Murray

FOURTH SEMESTER
CORE SUBJECT - PAPER VIII– AMERICAN LITERATURE

Contact Hours per Week: 4
Contact Hours per Semester: 60
Credits: 5   **Subject Code: U1ENC42**
Objectives

    i. to have a comprehensive study of American Literature
    ii. to study the literary texts with the social background of America
    iii. to appreciate Poetry, Prose, Novel, Short story and Drama produced in America

UNIT – I   Poetry   **(12 Hours to complete this unit)**

    Emily Dickenson   – I tasted a liquor never brewed

                          Tell all the truth but tell it slant

    Frost   - Home Burial

UNIT II   Prose   **(12 Hours to complete this unit)**

    Paul Elmer More   - The Solitude of Nathanial Hawthorne

UNIT III   Novel   **(12 Hours to complete this unit)**

    Mark Twain   - The Adventures of Tom Sawyer

UNIT IV   Short story   **(12 Hours to complete this unit)**

    Ernest Hemingway - The Snows of Kilimanjaro
    Poe   - The Fall of the House of Usher

UNIT V   Drama   **(12 Hours to complete this unit)**

    Tennessee Williams - The Glass Menagerie.

Books Recommended for Study:

1. **An Anthology of American Literature 1890 – 1965.** Egbert. S. Oliver.
2. **An Anthology of American Literature of 19th Century.** Fisher Samuelson
3. **American Literature.** V.Sachithanandan.
4. **Students Handbook of American Literature**.C.D.Narasimhaiah.

FOURTH SEMESTER
ALLIED SUBJECT. PAPER IV–LITERARY CRITICISM

Contact Hours per week: 6
Contact Hours per semester: 90
Credits: 5   **Subject Code: U1ENA41**

Objectives

    i. to have a comprehensive study of the history of Criticism
    ii. to study the critical texts in English
    iii. to learn literary critics, and their contributions to English Literature

UNIT – I   **(18 Hours to complete this unit)**
    The contributions of Philip Sidney and Ben Jonson to literary criticism
UNIT II   **(18 Hours to complete this unit)**
    The contributions of Dryden and Pope to literary criticism
UNIT III   **(18 Hours to complete this unit)**
    The contributions of Wordsworth and S. T. Coleridge to literary criticism
UNIT IV   **(18 Hours to complete this unit)**
    The contributions of Arnold and Patter to literary criticism
UNIT V   **(18 Hours to complete this unit)**
    The contributions of T. S. Eliot and F. R. Leavis to literary criticism

Book Prescribed for study:

B.Prasad, <u>An Introduction to English Criticism</u>, Macmillan, Madras

Books Recommended for Study:

1. **Literary Criticism: A Short History.** Wimsatt and Cleaneth Brooks.
2. **Criticism in Practice.** Marie Peel.
3. **Textual and Literary Criticism.** Fredson Rowes.
4. **A History of Modern Criticism**. Rene Wellek

FOURTH SEMESTER
SKILL BASED ELECTIVE PAPER II – INTRODUCTION TO SOFT SKILLS

Contact Hours per Week: 2

Contact Hours per Semester: 30

Credits: 5   **Subject Code: U1ENS41**

Objectives

    i.   to introduce the learners to Soft Skills in general.

    ii.   to create awareness among the learners the importance of soft skills

    iii. to initiate them to imbibe the skills through intensive training

UNIT – I: BEHAVIOURAL TRAITS   **(6 Hours to complete this unit)**

    Innovation and creativity

UNIT II: COMMUNICATION SKILLS   **(6 Hours to complete this unit)**

    Presentation Techniques

    Discussion Etiquettes

UNIT III: LEADERSHIP SKILLS   **(6 Hours to complete this unit)**

    Organizational Skills

    Decision making and problem solving

UNIT IV: TIME MANAGEMENT   **(6 Hours to complete this unit)**

    Time utilization skills

UNIT V: STRESS MANAGEMENT   **(6 Hours to complete this unit)**

    Mind Tools – prevent, reduce and cope with stress

Books for Reference:

    1.Rizvi ,Ashraf .M. **Effective Technical Communication**. New Delhi. Tata Mc Graw

    Hill Publishing Company Ltd.,2008.

    2.Geddes & Grosset. **Yoga and Meditation.** Scotland: David House,2005.

    3. Cairo, JIM **Mot ivation and Goal – Setting**. Bangalore: Master mind Books,1999.

FOURTH SEMESTER
SKILL BASED ELECTIVE - PAPER III – READING AND WRITING SKILLS

Contact Hours per week: 2

Contact Hours per semester: 30

Credits: 5   **Subject Code: U1ENS42**

Objectives

    i.   to train the learners in intensive and extensive reading

    ii.   to transfer receptive skills to productive skills

    iii. to expose the learners to some useful writing practices

UNIT – I &II   **(6 + 6 =12 Hours to complete this unit)**

    Comprehension I & II (2 short passages of 300 words each)

    i.   Comprehension questions of different levels (of understanding & difficulty)

    ii.   Interpretation of data

    iii.   Vocabulary items related to Text

UNIT III   **(6 Hours to complete this unit)**

    Essay Writing

    Notice

UNIT IV   **(6 Hours to complete this unit)**

    Paragraph writing

    Telegram

    Message

    Advertisement

UNIT V   **(6 Hours to complete this unit)**

    Precis

    Report

Books Prescribed for study

    1. Freeman, Sarah, **Strengthen your English**

Books for Reference:

    1. Pillai, G.Radhakrishna &Co. **Written English for You**, Chennai, Emerald Publishers, 2004.

    2. Tickoo, Chamjea & Jaya Sasikumar, **Writing with a Purpose**, Chennai, OUP,1979.

    3. Tickoo & Paul Gunasekar, **Reading for Meaning,** New Delhi, S.Chand & Company Ltd., 2004.

CHOICE BASED CREDIT SYSTEM

Course Name: M.A. English Literature

Discipline   : English

Rules and regulations, Course Scheme and Scheme of Examinations
(For those who joined in June 2012 and after)

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1. Course Objectives:

The objectives of the M. A. Degree Course in English are

i. to acquire advanced knowledge in the main areas of English Literature and Language.

ii. to develop experts in English language and Literature.

iii. to help advance literary sensibility and critical judgement.

iv. to develop linguistic abilities – compositional and communicative skills.

v. to train students in independent use of tools of learning i.e. study and reference skill.

2. Eligibility for admission:

A student who has passed B.A. Degree Examination with English as major subject or any UG degree with English as Part II subject atleast for two years of any recognized University shall be admitted to M.A. Programme.

3. Duration of the Course:

M.A. Programme will be of two years duration. Each academic year consists of two Semesters. The duration of a Semester is 90 working days.

4. Course Scheme

Semester	Part	Subject	Hour	Credit	Sub. Code	Revision
III	Core 10	Literary Theories	6	5	P1ENC31	Revised
	Core 11	Indian Writing in English	6	4	P1ENC32	Revised
	Core 12	Canadian Literature	6	4	P1ENC33	New
	Core 13	History of English Language	6	4	P1ENC34	Revised
	Elective - 2	Comparative Literature	6	5	P1ENE31	No Change

Semester	Part	Subject	Hour	Credit	Sub. Code	Revision
IV	Core 14	Translation: Theory	6	4	P1ENC41	New
	Core 15	Postcolonial Literature	6	4	P1ENC42	New
	Core 16	World Classics in Translation	6	4	P1ENC43	New
	Core 17	Women's Writings in English	6	4	P1ENC44	New
	Elective - 3	Project	6	5	P1EN4PV	No Change

THIRD SEMESTER
CORE SUBJECT PAPER X– LITERARY THEORIES

Contact Hours per week: 6
Contact Hours per semester: 90
Credits: 5   **Subject Code: P1ENC31**
Objectives

    i. to have a comprehensive study of the literary theories in English
    ii. to study various literary theories in depth
    iii. to study literary texts in the light of the theories

UNIT – I   **(18 Hours to complete this unit)**
    Structuralism
    From S/Z – Roland Barthes
UNIT II   **(18 Hours to complete this unit)**
    Feminism
    Medussa's Voice: Male Hysteria in Bostonians – Claire Kahane
UNIT III   **(18 Hours to complete this unit)**
    Marxist Literary Theory
    Marxism and Literature – Raymond Williams
UNIT IV   **(18 Hours to complete this unit)**
    Postcolonial Theory
    Of Mimicry and Man: The Ambivalence of Colonial Discourse – Homi K.Bhaba
UNIT V   **(18 Hours to complete this unit)**
    Cultural Studies
    Cultural Studies and Reading - J. Hillis Miller

Recommended Text Book

     Literay Theories: A Reader and Guide ed. Julian Wolfreys. Edinburgh University Press, UK. 1999

Books for reference:

     Introducing Literary Theories: A Guide and Glossary Ed. Julian Wolfreys. Atlantic Publishers and Distributors, New Delhi – 2001

     Literary Theory and Criticism Prof. M. Velayadhan Pillai, Gnanda Prakashan New Delhi: 2012

THIRD SEMESTER
CORE SUBJECT PAPER XI – INDIAN WRITING IN ENGLISH

Contact Hours per Week: 6
Contact Hours per Semester: 90
Credits: 5   **Subject Code: P1ENC32**

Objectives
    i.   to have a comprehensive study of Indian Writing in English
    ii.   to study the literary texts with the social background of India
    iii.   to learn social and literary movements, and political changes that influence Indian Writing in English

UNIT – I Poetry   **(18 Hours to complete this unit)**
    A.K. Ramanujan   – Small Scale Reflections on a Great House
    K. N. Daruwalla   - Death by Burial
    Kamala Das   - The Old Playhouse.

UNIT II Poetry   **(18 Hours to complete this unit)**
    Tagore   - Gitanjali

UNIT III Prose   **(18 Hours to complete this unit)**
    V. S. Srinivasa Sastri   - Immortal Ramayana
    Jawaharlal Nehru   - Life's Philosophy

UNIT IV Fiction   **(18 Hours to complete this unit)**
    Aravind Adiga   - The White Tiger
UNIT V Drama   **(18 Hours to complete this unit)**
    Mahesh Dattani   - Bravely Fought the Queen

Recommended Text Books

Contemporay Indian Poetry in English. Ed. Saleem Peeratina, Macmillan, 1972.

Indian English Prose : An Anthology Ed. D. RamaKrishna Arnold Heinemann, New Delhi. 1980.

THIRD SEMESTER
CORE SUBJECT PAPER XII– CANADIAN LITERATURE

Contact Hours per Week: 6
Contact Hours per Semester: 90
Credits: 5   **Subject Code: P1ENC33**
Objectives

    i. to have a comprehensive study of Canadian Literature

    ii. to study the popular literary texts of Canada

    iii. to learn the contributions made by Canadian writers to World Literature

UNIT – I   **Poetry**   **(18 Hours to complete this unit)**

Isabella Valency	– The Camp of Souls
Wilfred Campbell	- The Winter Lakes
Duncan Campbell Scott	- Night and the Pines
E. J. Pratt	- The Prize Cat

UNIT II   **Poetry**   **(18 Hours to complete this unit)**

F. R. Scott	- The Canadian Authors Meet
A. J. M. Smith	- Son – and – Heir
Earle Birney	- Vancouver Lights
A. M. Klein	- Portrait of the Poet as a landscape

UNIT III   **Prose**   **(18 Hours to complete this unit)**

Dennishee From "Caderce, Country, Silence: Writing in Colonial Space" – "**Country**"

                                           section alone

Thomas Chandler Haliburton   - The Clock master "First Series 1 & 2 alone

UNIT IV   **Novel**   **(18 Hours to complete this unit)**

Margaret Laurence	- The Stone Angel
Mordecai Richler	- Son of a Smaller Hero

UNIT V   **Drama**   **(18 Hours to complete this unit)**

James Reaney	- The Easter Egg
Robertson Davies	- At my Heart's Core.

Recommended Text Book

     An Anthology of Canadian Literature in English .Volume I & II. Ed. Russell Brown & Donna Bennett, OUP, Toronto, 19991.

THIRD SEMESTER
CORE SUBJECT PAPER XIII– HISTORY OF ENGLISH LANGUAGE

Contact Hours per Week: 6
Contact Hours per Semester: 90
Credits: 5   **Subject Code: P1ENC34**
Objectives

    i. to have a comprehensive study of the history of English Language
    ii. to study the place, and making of English
    iii. to learn the changes in meaning, spelling and varieties of English

UNIT – I   **(18 Hours to complete this unit)**

    Four major theories in the origin of language
    Place of English in the Indo-European family of languages

UNIT II   **(18 Hours to complete this unit)**

    Grimm's Law and Verner's Law
    Foreign Elements/Latin, Greek, French, Scandinavian

UNIT III   **(18 Hours to complete this unit)**

    Word-making in English
    Semantics

UNIT IV   **(18 Hours to complete this unit)**

    History of English Spelling and Spelling Reform
    Makers of English

UNIT V   **(18 Hours to complete this unit)**

    Standard English
    The impact of Science on English
    The American English

THIRD SEMESTER

ELECTIVE PAPER II– COMPARATIVE LITERATURE

Contact Hours per Week: 6
Contact Hours per Semester: 90
Credits: 5   **Subject Code: P1ENE31**
Objectives

    i. to have a comprehensive study of the definition and the scope of Comparative Literature

ii. to study the various schools of comparative literature

iii. to learn the relation between literature and other arts

UNIT – I   **(18 Hours to complete this unit)**

Comparative Literature' – Definition and Scope

UNIT II   **(18 Hours to complete this unit)**

The American, French & Indian Schools of Comparative Literature

UNIT III   **(18 Hours to complete this unit)**

Influence and Reception

Epoch, Period, Generation and Movement

Genre

UNIT IV   **(18 Hours to complete this unit)**

Thematology

Motif

UNIT V   **(18 Hours to complete this unit)**

Literature and Psychology

Literature and Sociology

Literature and Arts and Film

Text Books:

Newton. P. Stallknecht & Horst Frenz, Eds. **Comparative Literature: Method & Perspective.** Univrsity of Southern Illinois Press, (1961). Second Enlarged and modified edition, 1971.

Ulrich Weisstein. **Comparative Literature and Literary Theory: Survey and Introduction (** Indian University Press, 1973)

FOURTH SEMESTER
CORE PAPER XIV – TRANSLATION: THEORY AND PRINCIPLE

Contact Hours per Week: 6

Contact Hours per Semester: 90

Credits: 5   **Subject Code: P1ENC41**

Objectives

    i.to have a comprehensive study of the theory and principles of translation

    ii.   to study the history and kinds of translation

    iii. to introduce the students to the Indian translators and their works

UNIT – I   **(18 Hours to complete this unit)**

Definition. Theory and Principles

Types of translations, Coding Decoding and Recoding, Problems of Equivalence, Loss and gain and Untranslatability.

UNIT II   **(18 Hours to complete this unit)**

History of translation (The Romans, Early Theorists, the Renaissance, the 17th century. the 18th Century, Romanticism, Post-Romanticism, the Victorians and the 20th Century).

UNIT III   **(18 Hours to complete this unit)**

The Bible Translations

UNIT IV   **(18 Hours to complete this unit)**

Translating Poetry, Translating Prose, and Translating Dramatic texts and Technical texts.

UNIT V   **(18 Hours to complete this unit)**

Is translation an art or science?

Translation in Indian Context

 Indian Translators and Translated texts (Bharati's, Shakespeare's, A.K.Ramanujan's)

Book Prescribed for Study

    1.Dr.J.Samuel Kirubahar, **Translatology**. Emerald Publications, Madurai.

Books Recommended for Study

1. Susan Bassnett, **Translation Studies**, London: Methuen.1985.
2. 2. Hillaire Belloc, **On Translation.** Oxford: The Clarendon Press, 1975.
3. Duff, Alan. **Translation.** Oxford: ELBS, 1989.

FOURTH SEMESTER

CORE SUBJECT PAPER XV– POSTCOLONIAL LITERATURE

Contact Hours per Week: 6

Contact Hours per Semester: 90

Credits: 5   **Subject Code: P1ENC42**

Objectives

    i. to have a comprehensive study of the Postcolonial Literature in English

ii. to study the literary texts with the background of Postcolonialism

iii. to learn the literary movements, and political changes that influence Postcolonial Literature

UNIT – I	Poetry	(18 Hours to complete this unit)

Judith Wright – The Harp and the King

David Rubadiri - A Negro Labourer in Liverpool

Derek Wallcott - A Far Cry from Africa

Kishwar Naheed - I am not that Woman

UNIT II	Prose	(18 Hours to complete this unit)

Chinua Achebe - The Nature of the Individual and His Fulfilment

UNIT III	Fiction	(18 Hours to complete this unit)

Bapsi Sidhwa - Ice-candy Man

Jhumpa Lahiri - The Namesake

UNIT IV	Drama	(18 Hours to complete this unit)

Girish Karnad – Tughlaq

UNIT V	Postcolonial Theory	(18 Hours to complete this unit)

Bill Asharoft et.al. - The Empire Writes Back (Chapters 1 and 5 only)

Recommended Text Book

1. **An Anthology of Commonwealth Poetry**. C.D.Narasimhaiah. Macmillan, Chennai.

2. **Awakened Conscience: Studies in Commonwealth Literature**. ed. C.D.Narasimhaiah.

FOURTH SEMESTER

CORE SUBJECT PAPER XVI– WORLD CLASSICS IN TRANSLATION

Contact Hours per Week: 6

Contact Hours per Semester: 90

Credits: 5   **Subject Code: P1ENC43**

Objectives

i. to have a comprehensive study of the world classics in Translation

ii. to study the literary texts with different social background

iii. to learn and appreciate the translator's art

UNIT – I	Poetry	(18 Hours to complete this unit)

Tirukural – Chapter I Virtue - GU Pope's Translation

Dante - The Divine Comedy Canto I to VI

UNIT II	Prose	(18 Hours to complete this unit)

Bhagavad Gita - Chapter XVIII - Dr. Radhakrishnan

My Experiments with Truth - M. K. Gandhi 1-3 Chapters
Translator Mahadevi Desai

UNIT III   Short story   (18 Hours to complete this unit)

Guy de Maupassant   - The Necklace
Rajam Krishnan   - Tension (Shakitya Academy)
Ashoka Mitran   - A Pride of an Ascetic
La. Sa. Ramamirtham   - Ammulu (Sakitya Academy)

UNIT IV   Novel   (18 Hours to complete this unit)

Bama   - Sangati
TAkali Sivasankaran Pillai   - Chemmen

UNIT V   Drama   (18 Hours to complete this unit)

Vijay Tendulkar   - Silence! The Court is in Session
Girish Karnad   - Fire and Rain

FOURTH SEMESTER

CORE SUBJECT PAPER XVII – WOMEN'S WRITINGS IN ENGLISH

Contact Hours per Week: 6
Contact Hours per Semester: 90
Credits: 5   Subject Code: P1ENC44
<u>Objectives</u>

i.   to have a comprehensive study of the women's writing in English
ii.   to study the literary texts written by Women
iii.   to learn social and literary movements, and political changes that influence Women's Writings

UNIT – I   POETRY   (18 Hours to complete this unit)

Sylvia Plath   – The Lady Lazurus
Kamala Das   – The Eunuchs

UNIT II   PROSE   (18 Hours to complete this unit)

Adrienne Rich   – Toward a Woman Centered University

UNIT III   NOVEL   (18 Hours to complete this unit)

Toni Morrison   - Beloved
Margaret Atwood   - Bodily Harm

UNIT IV   NOVEL   (18 Hours to complete this unit)

Arundhati Roy   - The God of Small Things
Bharathi Mukherjee   - Wife (Novel)

UNIT V   CRITICISM   (18 Hours to complete this unit)

Virginia Woolf   - A Room of One's Own

FOURTH SEMESTER

ELECTIVE PAPER III– PROJECT

Contact Hours per Week: 6

Contact Hours per Semester: 90

Credits: 5   **Subject Code: P1EN4PV**

Objectives

    i.to study the literary texts and interpret and criticize the literary texts

    ii.to train the students to learn the mechanics of writing

    iii. to expose the students to research methodology

Elective –Major – but Compulsory

Projects titles will be allotted by the Research guides (the teachers in the department) in areas related to the courses taught in the previous semesters.

There is no internal evaluation for the project.

Project to be valued for 100 marks

Course Name: Bachelor of Arts
Discipline   : Economics

COURSE SCHEME:

Sem	Part	Subject	Hour	Credit	Int+Ext=Total	Code	Revision
III	Part I	Tamil/Hindi	6	3	25+75=100	U1PT31/ U1PH31	Revised
	Part II	English	6	3	25+75=100	U1PE31	Revised
	Core 5	Macro Economics I	5	4	25+75=100	U1ECC31	Revised
	Core 6	Mathematical Methods I	5	4	25+75=100	U1ECC32	Revised
	Allied 3	Tamilnadu Economy	6	5	25+75=100	U1ECA31	New
	SBE-1	Foreign Trade	2	2	25+75=100	U1ECS31	New

Sem	Part	Subject	Hour	Credit	Int+Ext=Total	Code	Revision
IV	Part I	Tamil/Hindi	6	3	25+75=100	U1PT41/ U1PH41	Revised
	Part II	English	6	3	25+75=100	U1PE41	Revised
	Core 7	Macro Economics II	4	4	25+75=100	U1ECC41	Revised
	Core 8	Mathematical Methods II	4	4	25+75=100	U1ECC42	Revised
	Allied 4	Entrepreneurship Development	6	5	25+75=100	U1ECA41	New
	SBE-2	Economics of Tourism	2	2	25+75=100	U1ECS41	Revised
	SBE-3	Advertisement	2	2	25+75=100	U1ECS42	New

Year	Part	Subject	Hour	Credit	Int=Total	Code
I & II	Part V	NSS/NCC/ Physical Education-Sports	-	1	100	U1NS1 / U1NC1/ U1PS1

III SEMESTER - CORE PAPER - 5
MACRO ECONOMICS - I
(For those who joined from June 2012 onwards)

Contact Hours Per Week: 05   Subject Code: U1ECC31

Contact Hours per Semester: 75

Credits: 4

Objectives:

To enable the students to
i. understand the basic macro economic concepts and theories.
ii. equip themselves to prepare for competitive examinations
iii. pursue higher studies in this field.

UNIT I: - Introduction   **(15 hours)**

Macro Economics: Meaning – Definition – Micro and Macro Economics − Importance and limitations of Macro Economics – Circular flow of economic activities.

UNIT II: - National Income   **(15 hours)**

Meaning of National Income – Concepts: GNP, GDP, NNP, NI, PI and DPI - Per capita income – Money Income and Real income – Methods of estimating National Income – Difficulties in Computation of National Income – Importance of National Income Accounting.

UNIT III:- Theories of Employment   **(15 hours)**

Meaning of Full Employment, Unemployment and Underemployment.
Classical Theory of Employment: Assumptions – Features - Say's Law of Market, Pigou's Wage Cut Theory of Unemployment - Criticism of Classical Theory of Employment.
Keynesian Theory of Employment

The Principle of Effective Demand: Meaning – Aggregate Demand Function and Aggregate Supply Function – Determination of Level of employment – Importance of Effective Demand – Critical evaluation of Keynesian Theory of Employment

UNIT IV: - Inflation and Deflation   **(15 hours)**

Meaning of Inflation - Types - Causes and Effects - Anti-inflationary measures – Meaning of Disinflation - Inflationary Gap: Meaning – Illustration – Diagrammatic explanation – Philip's curve – Deflation: Meaning and Features – Meaning of Stagflation.

UNIT V: - Trade Cycle   **(15 hours)**

Meaning of Trade Cycle – Phases of trade cycle – Theories of Trade Cycle: Psychological theory, Under-Consumption Theory, Monetary Theory and Over-Investment Theory – Monetary and Fiscal Policy Measures to control the cyclical fluctuations in the economy.

Text Books:
1. M L Jhingan, (**2005)** Macro Economic Theory, Vrinda Publications, New Delhi.
2. H L Ahuja, (**2001)** Macro Economic Theory and Policy, S. Chand & Company Ltd., New Delhi.

Reference Books:
1. R D Gupta, (**1968)**, Keynesian Economics, S.Nagin & Co, Delhi.
2. Rana, K.C. and Verma K.N., (**2012)**, *Macro Economic Analysis,* Vishal Publishing Company, NewDelhi

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III SEMESTER - CORE PAPER - 6
MATHEMATICAL METHODS – I
(For those who joined from June 2012 onwards)

Contact Hours Per Week: 05   Subject Code: U1ECC32

Contact Hours per Semester: 75

Credits: 4

Objectives:

> **To enable the students to**
> i. understand the fundamentals of elementary mathematical tools
> ii. prepare for appearing various competitive examinations
> iii. apply them in higher studies.

Unit I : Introduction   **(15 hours)**

     Nature and Scope of Mathematical Economics – Role of Mathematics in Economics Theory – Mathematical Economics Vs Descriptive Economics – Mathematical Economics Vs Econometrics.

Unit II : Elementary Algebra   **(15 hours)**

     Basic Rules of Arithmetic Operations – The Real Number System – Constant – Variable – Linear, Quadratic, Exponential and Logarithmic Functions and their Graphical Representation.

Unit III : Equations   **(15 hours)**

     Solving of Equations: Linear and Quadratic Equations in one Variable – Simultaneous Equations with Two and Three Variables.

Unit IV: Logarithm, Permutations and Combinations   **(15 hours)**

     Logarithm: Definition – Formula (Project, Quotient, Exponent) – Calculations using tables. Permutations and Combination: Factorial Notation – Fundamental Principles.

Unit V : Set Theory   **(15 hours)**

     Definition of a Set – Types – Equality of Set – Universal Set – Operation of Sets – Union and Intersection of Sets – Difference of Sets – Complement of a Set – De-Morgan Law – Venn Diagram.

Text Books:

1. Bose D **(2007)** "An Introduction to Mathematical Methods; Himalaya Publishing House, Mumbai
2. Chiang A.C **(1986),** Fundamental Methods of Mathematical Economics, Mc. Graw, Hill London.

Reference Books:

1. Allen R.G.D, **(1986),** Mathematical Analysis for Economists, Macmillan, London.
2. Mehta, B.C. and Madnani, G.M.K, **(2003)** 'Mathematics for Economists', Sultan Chand & Sons, New Delhi.

III SEMESTER - ALLIED PAPER - 3
TAMIL NADU ECONOMY
(For those who joined from June 2012 onwards)

Contact Hours Per Week: 06   Subject Code: U1ECA31

Contact Hours per Semester: 90

Credits: 5

Objectives:

To enable the students to
i.   know about our Tamil Nadu economy
ii. suggest measures for policy matters for further development of the economy.
iii. equip themselves to face interviews for jobs.

UNIT I: - General profile   **(18 hours)**

Natural resources: Land, Water, Forest, Mineral, Energy resources – Human resources: Size and growth of population, Sex ratio, Density of Population, Education and Health - Development Indicators of Tamil Nadu Economy: Per Capita Income, Infant Mortality Rate, Birth Rate, Death Rate, – Recent Development of Tamil Nadu economy – Role of Tamil Nadu state in the economic development of India.

UNIT- II: - Primary Sector (Agriculture)   **(18 hours)**

Land tenure system: Zamindari, Mahalwari and Ryatwari system – Bhoodan Movement. Crop cultivation – Performance of major agricultural crops - Green Revolution — Regulated market. Role of agriculture sector in the economic development of Tamil Nadu economy.

UNITIII: - Secondary Sector (Industry)   **(18 hours)**

Large scale industries: Iron and Steel, Cotton Textile, Sugar,and Paper industries - Small Scale Industry: Progress, Problems – Policies and Programmes - Role of small scale industries in Tamil Nadu economy.

UNIT IV: Tertiary Sector (Services)   **(18 hours)**

Financial Sector: Banking, Non-Banking and Insurance – Performance of financial sector in Tamil Nadu economy. Transport: Roadways, Railways, Waterways and Airways. Communication: Radio, News paper, Television, Cellphone and Internet.

UNIT V: - Poverty and Unemployment   **(18 hours)**

Poverty: Causes and Consequences of Poverty – Poverty Eradication Programmes in Tamil Nadu - Unemployment: Causes and Consequences of Unemployment – Employment Generation Programmes in Tamil Nadu -

Text Books:
1. N. Rajalakshmi, **(2011)**, Tamil Nadu Economics, Allied publishers Pvt. Ltd., Chennai.
2. S. Perumalsamy **(1990)**,Economic Development of Tamil Nadu, S.Chand & Company Ltd, New Delhi

Reference Books
1. A G Leonard SJ, **(2006),** Tamil Nadu Economy, Macmillan India Ltd., Delhi.
2. MIDS **(1988),** Tamil Nadu Economy: Performance and Issues, Oxford and IBH Publication, New Delhi.

III SEMESTER – SKILL BASED ELECTIVE PAPER - 1
FOREIGN TRADE
(For those who joined from June 2012 onwards)

Contact Hours Per Week: 02   Subject Code: U1ECS31

Contact Hours per Semester: 30

Credits: 2

Objectives:

To enable the students to
   i. understand thoroughly export and import trends of our economy.
   ii. pursue higher studies in foreign trade.
   iii. prepare for competitive examinations.

Unit I : India's Export Trade   **(6 hours)**

India's Export since 1950-51 – Composition of Export – Major exports – Export Promotion: Objectives – Export Promotion Measures.

Unit II : India's Import Trade: **(6 hours)**

India's Import since 1950-51 –Composition of Import - Major Imports – Import Substitution: Objectives – Import Substitution Measures.

Unit III: Foreign Trade Policy   **(6 hours)**

Foreign Trade (Development and Regulation) Act, 1992: Objectives – Main Provisions – Export Policy Resolution, 1970 : Features – EXIM Policy (1997-2002): Objectives – Salient features – evaluation – New EXIM Policy (2002 – 2007): objectives – General Provisions – Highlights.

Unit IV : Export Finance   **(6 hours)**

Export Finance: Pre-Shipment Finance and its types – Post-Shipment Finance and its types – EXIM Bank : Objectives and its role in export finance - Export Credit and Guarantee Corporation (ECGC): Objectives and its role in export finance .

Unit V : Counter Trade Policy   **(6 hours)**

Origin and nature of Counter Trade – Forms: Barter – Buy back – Switch-trade – Compensation Trading – Counter purchase – Escrow Account Trade–Counter Trade in India – Case for and against Counter Trade.

Text Books:
   1. Francis Cherunilam (**2010**) "International Trade and Export Management; Himalaya Publishing House, Mumbai
   2. Usha Kiran Rai (**2010**), Export – Import and Logistics Management, Prentice Hall of India Learning Private Limited, New Delhi.

Reference Books:
   1. T.A.S. Balagopal, (**2010**), "Export Management", Himalaya Publishing House, Mumbai
   2. Francis Cherunilam, (**2001**), 'Business Environment', Himalaya Publishing House, Mumbai

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IV SEMESTER - CORE PAPER - 7
MACRO ECONOMICS - II
(For those who joined from June 2012 onwards)

Contact Hours Per Week: 04   Subject Code: U1ECC41

Contact Hours per Semester: 60

Credits: 4

Objectives:

To enable the students to
  i. understand the basic macro economic concepts and theories.
  ii. pursue higher studies in this field.
  iii. prepare for competitive examinations.

UNIT I: Consumption Function   **(12 hours)**

Meaning of consumption function – Consumption Function Schedule – Keynesian Psychological Law of Consumption – APC and MPC, APS and MPS – Determinants of Propensity to Consume: External factors and Internal factors – Importance and Limitations of Consumption Function.

UNIT II: Investment Function   **(12 hours)**

Meaning – Kinds – Autonomous Investment and Induced Investment – Marginal Efficiency of Capital (MEC): Meaning – Calculation of MEC– MEC schedule – Factors determining MEC - Rate of Interest and Investment.

UNIT III: Multiplier   **(12 hours)**

Investment Multiplier: Meaning – Calculation – Working of Multiplier – Tabular and diagrammatic explanation – leakages – Importance – Limitations.

UNIT IV: Accelerator   **(12 hours)**

Acceleration: Meaning – Assumptions - Basic equation – Tabular and diagrammatic explanation — Criticisms – Interaction between Multiplier and Accelerator (Super-Multiplier)

UNIT V: Macro Theories of Distribution   **(12 hours)**

Ricardian Theory of Income Distribution – Marxian Theory of Income Distribution - Kaldor's Theory of Macro Distribution - Modern Theory of Distribution.

Text Books:
  1. M L Jhingan, **(2005),** Macro Economic Theory, Vrinda Publications, New Delhi.
  2. H L Ahuja, **(2001),** Macro Economic Theory and Policy, S. Chand & Company Ltd., New Delhi.
  3. K K Dewett, **(2009),** Modern Economic Theory, S.Chand & Company Ltd., New Delhi.

Reference Books:
  1. R D Gupta, **(1968),** Keynesian Economics, S.Nagin & Co, Delhi.
  2. Rana, K.C. and Verma K.N.**(2012),** Macro Economic Analysis, Vishal Publishing Company, New Delhi

IV SEMESTER - CORE PAPER - 8
MATHEMATICAL METHODS - II
(For those who joined from June 2012 onwards)

Contact Hours Per Week: 04   Subject Code: U1ECC42
Contact Hours per Semester: 60
Credits: 4
Objectives:

To enable the students to
iv. understand the fundamentals of elementary mathematical tools.
v. prepare for appearing various competitive examinations
vi. apply them in higher studies.

Unit I : Matrices   12 hours)
Meaning – Types of Matrices – Operation of Matrices : Addition, Subtraction and Multiplication – Transpose of a Matrix – Determinants – Rank of a Matrix – Minor – Cofactor-Adjoint to the Matrix – Inverse of a square matrix – Solving a System of Linear Equations – Matrix Inversion Technique – Cramer's Rule.

Unit II : Differential Calculus   (12 hours)
Definition and Meaning – Rules of Differentiation – Partial Differentiation – Total Differentiation – Maxima and Minima with one independent variable - Applications in Economics and Business

Unit III : Theory of Consumer Behaviour   (12 hours)
Cardinal Utility Approach – Ordinal Utility Approach – Maximization of Utility – Demand Function – Elasticity of Demand - Applications in Economics and Business.

Unit IV : Theory of Production   (12 hours)
Cost Functions and Curves – Revenue Functions and Curves – Equilibrium of a Firm – Maximisation of Profit - Applications in Economics and Business

Unit V: Integral Calculus   (12 hours)
Meaning – Basic Rules of Integration – Definite Integration – Area Between two Curves – Cost Function – Revenue Function – Consumer's Surplus – Producer's Surplus.

Text Books:

1. Bose D **(2007)** "An Introduction to Mathematical Methods; Himalaya Publishing House, Mumbai
2. Chiang A.C **(1986),** Fundamental Methods of Mathematical Economics, Mc. Graw, Hill London.

Reference Books:
1. Allen R.G.D, **(1986),** Mathematical Analysis for Economists, Macmillan, London.
2. Mehta, B.C. and Madnani, G.M.K, **(2003)** 'Mathematics for Economist', Sultan Chand & Sons, New Delhi.

IV SEMESTER - ALLIED PAPER -4
ENTREPRENEURSHIP DEVELOPMENT
(For those who joined from June 2012 onwards)

Contact Hours per Week: 06   Subject Code: U1ECA41

Contact Hours per Semester: 90

Credits: 5

Objectives:

To enable the students to
   i.   have basic knowledge to start own business
   ii. have a strong foundation for their future self-employment.
   iii. pursue higher studies in this field.

Unit I : Introduction   **(18 hours)**
   Evolution of the concepts of Entrepreneur – Entrepreneurship – Characteristics of an Entrepreneur – Functions – Types – Entrepreneur Vs Manager. Role of Entrepreneur in economic development – Theory of Entrepreneurship.

Unit II : Women Entrepreneurship   **(18 hours)**
   Concept – Functions – qualities – problems – Growth and development of women entrepreneurship – Women entrepreneurship in India.

Unit III: Entrepreneurial Motivation   **(18 hours)**
   Motivation – Meaning – Maslow's Need Hierarchy Theory – Herzberg's Two Factor Theory – Mc. Clelland's Achievement – Motivating Factors

Unit IV : Rural Entrepreneurship   **(18 hours)**
   Meaning – Need – Problems – how to develop Rural Entrepreneurship – Role of NGO's Factors affecting entrepreneurial growth – Economic factors – Non-economic factors – Government action.

Unit V : Entrepreneurship Development Programmes   **(18 hours)**
   Meaning of EDPS Importance – Objectives – Phase – Problems
Institutions assisting entrepreneurs: DIC – NSIC – SIDCO – SIBDI – ICC – KVIC – IDBI and ICICI.

Text Books:
   1. Gupta C.B., & Srinivasan N.P **(2010),** Entrepreneurial Development", Sultan Chand & Sons, New Delhi.
   2. Rengarajan. L, **(2008),** "Entrepreneurial Development", Sree Renga Publications, Rajapalayam, Tamilnadu.

Reference Books:

   1. Gordon, E and Natarajan ,K   **(2011)** 'Entrepreneurship Development, Himalaya Publication, Mumbai.
   2. Jayshree Suresh **(2011)** "Entrepreneurial Development" Margham publication, Chennai.

IV SEMESTER – SKILL BASED ELECTIVE PAPER - 2
ECONOMICS OF TOURISM
(For those who joined from June 2012 onwards)

Contact Hours Per Week: 02   Subject Code: U1ECS41

Contact Hours per Semester: 30

Credits: 2

Objectives:

To enable the students to
i. have a thorough knowledge of tourism centers in our country.
ii. pursue higher studies in this field
iii. prepare for various competitive examinations.

Unit I : Introduction   **(6 hours)**

Historical Growth of Tourism – Composition of Tourist Industry – Types of Tourism – Why tourism is growing – Limits to travel – Scope of Tourism in India.

Unit II : Socio-economic importance of Tourism   **(6 hours)**

Social aspects of Tourism – Topology of generating and receiving countries – Effects of economic development strategy -   effects on national economy – Land use development and other economic effects.

Unit III : Motivations Behind Tourism   **(6 hours)**

Basic Travel Motivators – Reasons for increasing Tourism – Motivators Cited in Modern Tourism – Reasons to become Tourists.

Unit IV: Tourism Planning   **(6 hours)**

Meaning - Advantages – Purpose – Co ordination in Planning – Planning Process – Carrying Capacity – importance of Tourism Planning.

Unit V : Tourism Development Organisation   **(6 hours)**

Role of Central Government, State Government, Local Government and NGO in Tourism Development – Tourism in the Era of Globalisation.

Text Books:
1. A.k. Bhatia **(2007)** "Tourism Development: Principles and Practices, Sterling Publishers Private Limited, New Delhi.
2. P.N.Seth and S.S. Bhat, **(2006)** 'An Introduction to Travel and Tourism' Sterling Publishers Pvt., Ltd., New Delhi.

Reference Books:
1. J.K. Sharma**, (2008)** 'Tourism Planning and Development: A New Perspective', Kanishka Publishers, New Delhi.
2. Ricard Sharpley and David J. Telfer (**2010) '**Tourism and Development: Concepts and Issues,' Viva Books Private Ltd., New Delhi.

IV SEMESTER – SKILL BASED ELECTIVE PAPER - 3
ADVERTISEMENT
(For those who joined from June 2012 onwards)

Contact Hours Per Week: 02   Subject Code: U1ECS42

Contact Hours per Semester: 30

Credits: 2

Objectives:

To enable the students to
   i.   understand the importance of advertising in marketing
   ii. prepare higher studies in this field
   iii. prepare for various competitive examinations.

Unit I : Introduction   **(6 hours)**
   Meaning – Nature and Scope of Advertising – Classification and Types of Advertising – Role of Advertising – Need for Advertising

Unit II : Advertising Budget   **(6 hours)**
   Meaning – Process – Methods of Advertising Budget - Social and Economic Aspects of Advertising

Unit III: Measuring Advertising Effectiveness   **(6 hours)**
   Worth of Advertising – Objectives – Process – Advertising Copy research – meaning – methods of copy testing – Advertising Goals Sales effectiveness measurement – limit of measurement.

Unit IV : Advertising Agency   **(6 hours)**
   Meaning of Advertising Agency – Functions – Types – Organisational Structure – Advantages – Selection of an Advertising Agency – Compensating.

Unit V : Advertising Strategy Planning and Organisation   **(6 hours)**
   Contribution of Advertising – Objectives – Advertising strategy – Level of decision making – Planning and managing advertising campaigns – Various advertising media – Media selection.

Text Books:
   1. Mahendra Mohan **(1998)** "Advertising Management"; Tata MC Graw, hill Publishing Company Limited, New Delhi.
   2. Chunawalla **(2001),** Advertising Theory and Practice, Himalaya Publishing House, Mumbai.

Reference Books:
   1. B.S Rathor, **(1997),** "Advertising Management", Himalaya Publishing House, Mumbai
   2. C.B. Gupta , **(2011)** 'Advertising & Personal Selling , Sultan Chand & Sons Educational Publishers, NewDelhi.

Course Name : **Bachelor of Arts**

Discipline : **History**

Course Scheme:

Semester	Part	Subject	Hour	Credit	Subject Code	Revision
III	Part I	தமிழ் / Hindi	6	3	U1PT31/U1PH31	Revised
	Part II	ஆங்கிலம்	6	3	U1PE31	Revised
	Core 5	இந்திய வரலாறு கி.பி 1707-1857 வரை	5	4	U1HSC31	New
	Core 6	தமிழக வரலாறு கி.பி 1529 - 1801 வரை	5	4	U1HSC32	Revised
	Allied 3	சுற்றுலாவின் அடிப்படை கொள்கைகள்	6	5	U1HSA31	Interchange
	SBE - 1	கல்வெட்டியல்	2	2	U1HSS31	New

Semester	Part	Subject	Hour	Credit	Subject Code	Revision
IV	Part I	தமிழ் / Hindi	6	3	U1PT41/U1PH41	Revised
	Part II	ஆங்கிலம்	6	3	U1PE41	Revised
	Core 7	இந்திய வரலாறு கி.பி 1857-2005 வரை	4	4	U1HSC41	New
	Core 8	தமிழக வரலாறு (1801-2006)	4	4	U1HSC42	Revised
	Allied 4	இந்தியாவில் சுற்றுலா பொருள்	6	5	U1HSA41	Interchange
	SBE - 2	இதழியல்	2	2	U1HSS41	Interchange
	SBE - 3	தொல்லியல் ஒரு அறிமுகம்	2	2	U1HSS42	New

Year	Part	Subject	Hour	Credit	**Code**
I & II	Part V	NSS/ NCC/ Physical Education – Sports	-	1	U1NS1/ U1NC1/ U1PS1

DETAILED SYLLABUS FOR EACH PAPER:

மூன்றாம் பருவம்

இந்திய வரலாறு கி.பி 1707-1857 வரை

Contact Hours per Semester: 75 hrs

Hours per week: 5   **Subject Code: U1HSC31**

Credits: 4

நோக்கங்கள் :

* கிழக்கிந்திய கம்பெனியாரின் நிர்வாக முறையினை மாணவர்கள் தெரிந்து கொள்ளுதல்.
* கிழக்கிந்திய கம்பெனியரின் ஆட்சி காலத்தில் ஏற்படுத்தப்பட்ட சமூக கொடுமைகளை நீக்கும் சட்டங்களை மாணவர்கள் புரிந்து கொள்ளுதல்.

அலகு 1 (20-hours)

பிற்கால முகலாயர்கள் - நாதிர்ஷாவின் இந்தியப்படையெடுப்பு - சீக்கியர்களின் எழுச்சி - குருநானக் - குரு அங்கோல் - குரு அமர்தாஸ் - ராம்தாஸ் - அர்ஜீன் - ஹரிகோவிந்த் - ஹரிராஜ் - ஹரிகிருஷ்ணன் - தேஜ்பகதூர் - குரு கோவிந்த் சிங் - கல்சா

அலகு 2 (10-hours)

பேஷ்வாக்கள் - பாலாஜி விஸ்வநாத் - பாஜிராவ் - மாதவராவ் - மூன்றாம் பானிபட் போர்

அலகு 3 (10-hours)

ஐரோப்பியர் வருகை - கர்நாடகப்போர்கள் - வங்காளத்தில் ஆங்கிலேய ஆதிக்க வளர்ச்சி - பிளாசிப் போர் - பக்சார் போர் - இரட்டையாட்சி - ராபர்ட் கிளைவ் - டியூப்ளே

அலகு 4 (15-hours)

வாரன் ஹேஸ்டின்ஸ் - சீர்த்திருத்தங்கள் - துரோக விசாரணை - காரன்வாலிஸ் - நிலையான நிலவரித்திட்டம் - ஹைதர் அலி - திப்புசுல்தான் - மைசூர் போர்கள் - வெல்லெஸ்லி பிரபுவும் துணைப்படைத் திட்டமும்

அலகு 5 (20-hours)

வில்லியம் பெண்டிங் பிரபுவின் சீர்த்திருத்தங்கள் - ராஜா ரஞ்சித் சிங் - டல்ஹௌஸி பிரபுவின் சீர்திருத்தங்கள் - அவகாசியிலி கொள்கை -

1857ம் ஆண்டு புரட்சி - காரணங்கள் - போக்கு - விளைவுகள் - புரட்சி தோல்விஅடைய காரணங்கள்

<u>நூற்பட்டியல்</u>

1) க. த. திருநாவுக்கரசு (Tr)	-	ஆகஸ்போர்ட்டின் இந்திய வரலாறு இரண்டாம் பகுதி
2) இரா. வேலாயுதம்	-	இந்திய வரலாறு
3) டி. எஸ். ராமலிங்கம்	-	இந்திய வரலாறு
4) ஆர். சத்தியநாதஐயர்	-	இந்தியவரலாறு II & III பகுதி
5) ஆர். சி. மஜீம்தார்	-	இந்திய வரலாறு

மூன்றாம் பருவம்

தமிழக வரலாறு கி.பி 1529 - 1801 வரை

Contact Hours per Semester: 75 hrs

Hours per week: 5 **Subject Code: U1HSC32**

Credits: 4

நோக்கங்கள் :

* தமிழகத்தில் ஆங்கிலேயர்களின் ஆட்சி எவ்வாறு ஏற்பட்டது என்பதை மாணவர்கள் தெரிந்து கொள்ளுதல்.

* தமிழக அரசு நடத்தும் டி.என்.பி.எஸ்.சி. போட்டி தேர்வுகளுக்கு மாணவர்களை தயார்படுத்துவதை நோக்கமாக கொண்டிருக்கின்றது.

அலகு 1 (10-hours)

மதுரை நாயக்கர்கள் - விஸ்வநாத நாயக்கர் - பாளையக் கார முறை - திருமலை நாயக்கர் - சொக்கநாதநாயக்கர் - இராணி மங்கம்மாள் - மீனாட்சி - மதுரை நாயக்கர்களின் வீழ்ச்சி

அலகு 2 (20-hours)

செஞ்சி நாயக்கர்கள் - வையப்ப நாயக்கர் - இரண்டாம் கிருஷ்ணப்ப நாயக்கர் - தஞ்சை நாயக்கர்கள் - செவப்ப நாயக்கர் - அச்சுதப்ப நாயக்கர் - இரகுநாத நாயக்கர் - விஜய ரகுநாத நாயக்கர் - செஞ்சி மற்றும் தஞ்சை நாயக்கர்களின் வீழ்ச்சி - நாயக்கர்களின் நிர்வாக முறை - சமுதாய மற்றும் பொருளாதார நிலை - சமய நிலை - பண்பாட்டு நிலை

அலகு 3 (15-hours)

மறவர் நாடும் சேதுபதிகளின் எழுச்சியும் - இராமநாதபுரம் சேதுபதிகள் - உடையான் சேதுபதி - இரகுநாத சேதுபதி - இரண்டாம் ரகுநாத சேதுபதி (கிழவன் சேதுபதி) - நிர்வாக முறை - சமுதாய மற்றும் பொருளாதார நிலை - சமய நிலை - பண்பாட்டு நிலை

அலகு 4 (10-hours)

தமிழகத்தில் மராட்டியர்கள் - வெங்காஜி - இரண்டாம் சரபோஜி - நிர்வாகமுறை - சமுதாய நிலை மற்றும் பொருளாதார நிலை - சமயநிலை - பண்பாட்டு நிலை

அலகு 5 (20-hours)

தமிழகத்தில் ஐரோப்பியர்கள் - கர்நாடகப்போர்கள் - பாளையக்காரர்களின் புரட்சி - கான்சாகிப் - புலித்தேவர் - வீரபாண்டிய கட்டபொம்மன் - சமுதாயநிலை - பொருளாதாரநிலை - சமயநிலை - தென்னிந்திய புரட்சி - காரணங்கள் - போக்கு - விளைவுகள்

பார்வை நூலகள்:

1. முற்காலத்தமிழ்நாட்டு வரலாறு - க. வெங்கடேசன்
2. R. SATHIYANATHAIYAR - History of the Nayakars of Madurai
3. K. RAJAYYAN - History of Tamilnadu (1956 - 1982)
4. N. SUBRAMANIYAN - History of Tamilnadu (1965 -1967)
5. K. RAJAYYAN - History of Madurai
6. A. Krishnaswamy - The Tamil Country under Vijayanagar
7. S. KATHIRVEL - History of the Maravas (1700 - 1802)
8. J. தர்மராஜ் - தமிழக வரலாறு (1336 - 1801)

மூன்றாம் பருவம்
சுற்றுலாவின் அடிப்படை கொள்கைகள்

Contact Hours per Semester: 90 hrs
Hours per week: 6 **Subject Code: U1HSA31**
Credits: 5

நோக்கங்கள் :

* சுற்றுலாவின் முக்கியத்துவத்தை மாணவர்களுக்கு புரிய வைத்தல்.
* பல்வேறு சுற்றுலா நிறுவனங்களைப் பற்றிய தெளிந்த அறிவினை மாணவர்களுக்கு கொடுத்தல்.

அலகு 1 (20-hours)

சுற்றுலா - பொருள் விளக்கம் - சுற்றுலாப் பயணி - வகைகள் - காலங்கள் தோறும் சுற்றுலா - சுற்றுலா வளர்ச்சிக்கான காரணங்கள்.

அலகு 2 (20-hours)

சுற்றுலாவின் அடிப்படைக் கூறுகள் - போக்குவரத்து - தங்கும் இடங்கள் - சுற்றுலா மையம் - சுற்றுலாவின் வகைகள்.

அலகு 3 (20-hours)

சுற்றுலாவின் முக்கியத்துவம் - சமுதாய - பொருளாதார மாற்றங்கள் - சுற்றுலா வழிக்காட்டிகள்

அலகு 4 (15-hours)

சுற்றுலா நிறுவனம் - உலக சுற்றுலா நிறுவனம் - பசிபிக் பகுதி நிறுவனம் - பயணமுகவர் - பயண ஆவணங்கள்

அலகு 5 (15-hours)

சுற்றுலா மேம்பாடு - ஒழுங்கமைக்கப்பட்ட பயணம் - தீமைகள் - சுற்றுச்சூழல்

Reference Books

1. A.K. Bhatia - Tourism Development Principles and Practices.
2. Negi - Tourism and Travel: concepts and Principles.
3. L.J. Crampon - The Development of Tourism.
4. Prah Seth and Shastra Seth Bhat - An Introduction to Travel and Tourism.

5. G. Colley	-	International Tourism
6. J. தர்மராஜ்	-	சுற்றுலா

மூன்றாம் பருவம்
கல்வெட்டியல்

Contact Hours per Semester: 30 hrs
Hours per week: 2   **Subject Code:** U1HSS31
Credits: 2
நோக்கங்கள் :
* * எழுத்துக்களின் தோற்றமும் வளர்ச்சியினைப் பற்றி மாணவர்கள் தெரிந்து கொள்ளுதல்
* * வரலாற்றுக்கு கல்வெட்டியலின் பங்களிப்பினை மாணவர்களுக்கு உணர்த்துதல்

பகுதி- 1   **(6-hours)**
          கல்வெட்டியல் அறிமுகம் - எழுத்துக்களின் தோற்றமும் - வளர்ச்சியும் - கருத்தெழுத்து பானைகுறீட்டுகள் - சொற்குறீயீட்டெழுத்து - அசையெழுத்து, கல்வெட்டு மொழி - பிராகிருதம், பாலி, சமஸ்கிருதம், பிறமொழி கல்வெட்டு, கல்வெட்டு எழுதப் பயன்பட்ட பொருள்.
பகுதி- 2   **(6-hours)**
          இந்தியாவில் எழுத்துக்களின் தோற்றமும், வளர்ச்சியும் - குறீயிடுகள் - சிந்து வெளி எழுத்து முறை, அசோகன் பிராமி, கரோஷ்டி, நாகரி எழுத்துக்கள்.
பகுதி- 3   **(6-hours)**
          தமிழ் நாட்டில் எழுத்துக்களின் தோற்றமும் வளர்ச்சியும் - பானை குறீயிடுகள் - தமிழ் - பிராமி - வட்டெழுத்துக்கள் - தமிழ் எழுத்து - கிரந்த எழுத்து - நாகரி எழுத்து.
பகுதி- 4   **(6-hours)**
          தமிழ் கல்வெட்டுக்களின் அமைப்பு முறை - காலந்தோறும் கல்வெட்டு வளர்ச்சி - காலக்கணிப்பு முறை - மெய் கீர்த்து தமிழ் எண்கள் - அளவு குறியீடுகள் - பல்லவர், பாண்டியர், சோழர் - விஜய நகர, நாயக்கர் காலக் கல்வெட்டுக்களின் அமைப்பு முறை.
பகுதி- 5   **(6-hours)**
          தமிழ் நாட்டு செப்பேடுகள் - நடுகற்கள் ஓலைச்சுவடிகள் - தமிழக வரலாற்றிற்கு கல்வெட்டுக்கள் துணை புரியும் முறை கல்வெட்டு ஆய்வுகள் - கல்வெட்டு தொடர்பான வெளியீடுகள்
                              1.மாங்குடி தமிழ் பிராமி கல்வெட்டுகள்
                              2.வேள்விக்குடி செப்பேடுகள்
                              3.மானூர் கல்வெட்டுகள்
                              4.உத்திர மேரூர் கல்வெட்டுகள்
                              5.குடுமியான்மலை கல்வெட்டுகள்
துணை நூற்பட்டியல்:-
1)இரா. நாகசாமி, மா. சந்திரமூர்த்தி, நடன, காசிநாதன், ச. ஹரிகரன் - "கல்வெட்டியல்" தமிழ்நாடு அரசு தொல்லியல் துறை,சென்னை 1972.
2) சுப்பிரமணியன் "பண்டையத் தமிழ் எழுத்துக்கள்" உலக தமிழாராய்ச்சி நிறுவனம் - சென்னை (1938)
3) நடன காசிநாதன் "கல்லெழுத்துக்கலை" மணிவாசகர் பதிப்பகம் - சென்னை.
4) க. ராஜன் "கல்வெட்டியல்" மனோ பதிப்பகம் பாண்டிச்சேரி
5) மாரே ராஜம் "சாசன சாலை", சென்னை- 1960.
6) ந. சுப்பிரமணியன் "தென்னிந்திய கோவில் கல்வெட்டுகள்"

நான்காம் பருவம்
இந்திய வரலாறு கி.பி 1857-2005 வரை

Contact Hours per Semester: 60 hrs

Hours per week: 4   **Subject Code:** U1HSC41

Credits: 4

நோக்கங்கள் :

* * இந்திய விடுதலைப் போராட்ட நிகழ்வுகளையும், இந்தியாவில் ஏற்பட்ட சமுதாய, சமய சீர்திருத்த இயக்கங்களைப் பற்றியும் மாணவர்கள் புரிந்து கொள்ளுதல்.
* * இந்திய அரசின் வெளியுறவுக் கொள்கையையும், பொருளாதார வளர்ச்சியினையும் தெரிந்து கொள்ளுதல்.

அலகு 1   **(10-hours)**

மகாராணியாரின் பேரறிவிப்பு - கானிங் பிரபு - முக்கிய நிகழ்ச்சிகள் மற்றும் சீர்த்திருத்தங்கள் - ரிப்பன் பிரபுவின் - சீர்த்திருத்தங்கள் - ஸ்தல சுயாட்சி முறை - இல்பர்ட் மசோதா - கர்சன் பிரபு - சீர்த்திருத்தங்கள்

அலகு 2   **(10-hours)**

இந்திய விடுதலைப் போராட்டம் - சுதந்திர உணர்வு தோன்ற காரணங்கள் - இந்திய தேசியக் காங்கிரசின் தோற்றம் - தீவிரவாதம் - பாலகங்காதர திலகர் - மிதவாதம் - கோபாலகிருஷ்ணன் கோகலே - வங்காள பிரிவினை - சூரத் காங்கிரஸ் பிளவு - தன்னாட்சி இயக்கம்

அலகு 3   **(15-hours)**

ஜாலியின் வாலாபாக் படுகொலை - கிலாபத் இயக்கம் - ஒத்துழையாமை இயக்கம் - சுயராஜ்யக்கட்சி - சட்டமறுப்பு இயக்கம் - காந்தி - இர்வின் ஒப்பந்தம் - மூன்று வட்ட மேஜை மாநாடுகள் - வெள்ளையனே வெளியேறு இயக்கம் - கிரிப்ஸ் தூதுக் குழு -இந்திய தேசியராணுவம் - வேவல் திட்டம் - காபினட் தூதுக்குழு - மவுண்ட் பேட்டன் திட்டம்.

அலகு 4   **(15-hours)**

சமுதாய - சமய சீர்த்திருத்தங்கள் - பிரம்ம சமாஜம் - பிராத்தனா சமாஜம் - ஆரிய சமாஜம் - ராமகிருஷ்ணா மடம் - பிரம்ம ஞான சபை - சமுதாய சீர்த்திருத்தங்கள் - கல்வி முறையின் வளர்ச்சி - இந்திய பொருளாதாரத்தில் ஆங்கில ஆட்சியின் தாக்கம் - ஆங்கிலேயர் ஆட்சி இந்தியாவிற்கு அளித்து சென்ற கொடைகள்.

அலகு 5   **(10hours)**

இந்திய வெளியுறவு கொள்கை - இந்தியாவும் கூட்டு சேரா இயக்கமும் - இந்தியாவும் சார்க் அமைப்பும் - மாநிலங்களின் மறுசீரமைப்பு - புதிய கல்விக்கொள்கை (1986) - திட்டமிட்ட பொருளாதார வளர்ச்சி - வேளாண்மை வளர்ச்சி - வாணிபம் மற்றும் தொழிற்துறை வளர்ச்சி- போக்குவரத்து - இந்திய கலாச்சார நடவடிக்கைகள்.

நூற்பட்டியல்

1. இரா. வேலாயுதம் - இந்திய வரலாறு, தமிழ்நாட்டுப் பாட நூல் நிறுவன்ம், சென்னை
2. க.த. திருநாவுக்கரவு (Tr) ஆகஸ்ட் போர்ட்டின் இந்திய வரலாறு III, தமிழ் வெளியீட்டுக் கழகம், சென்னை.
3. T.S.ராமலிங்கம் - இந்திய வரலாறு
4. ஜி. வெங்கடேசன் மற்றும் சந்திரகுரு - சமகால இந்திய வரலாறு, வி.சி. பப்ளிகேசன்ஸ், ராஜபாளயம்
5. G.வெங்கடேசன் - இந்திய விடுதலைப் போராட்ட வரலாறு

நான்காம் பருவம்
தமிழக வரலாறு **(1801-2006)**

Contact Hours per Semester: 60 hrs
Hours per week: 4   **Subject Code:** U1HSC42
Credits: 4

நோக்கங்கள் :

* * ஆங்கிலேய அரசின் நிர்வாக முறையினையும், விடுதலைப் போராட்டத்தில் தமிழகத்தின் பங்களிப்பினையும் மாணவர்களுக்கு போதித்தல்.
* * தமிழகத்திற்கு திராவிட இயக்கங்களின் பங்களிப்பினைப் பற்றியும், காங்கிரஸ் நிர்வாகத்திறனைப் பற்றியும் மாணவர்கள் தெரிந்து கொள்ளுதல்.

அலகு 1   **(10-hours)**

    வேலூர் கலகம் - காரணங்கள் - போக்கு - விளைவுகள் ஆங்கிலேயரின் நில வருவாய் நிர்வாகம் - நீதித்துறை நிர்வாகம் - மேற்கத்திய கல்வி முறையின் வளர்ச்சி - கிறிஸ்தவ அமைப்புகளின் சமூக பணிகள்

அலகு 2   **(15-hours)**

    சமூகசமய சீர்திருத்த இயக்கங்க்கள் - ஆலய நுழைவு இயக்கம் -நீதிக்கட்சியின் தோற்றம் - சாதனைகள் - பெரியார் - சுயமரியாதை இயக்கம் - முதலாவது ஹீந்தி எதிர்ப்பு போராட்டம் - சமூகநீதிக்கான போராட்டங்கள்

அலகு 3   **(10-hours)**

    சுதந்திர போராட்டத்தில் தமிழகத்தின் பங்கு - வ.உ.சிதம்பரம் பிள்ளை - பாரதியார் - வாஞ்சிநாதன் - சுப்பிரமணியசிவா - ராஜாஜி - சத்தியமூர்த்தி - காமராஜர்

அலகு 4   **(15-hours)**

    காங்கிரஸ் ஆட்சியின் கீழ் தமிழகம் - ராஜாஜியின் நிர்வாகமும். - குலக்கல்விதிட்டமும் - மொழிவாரி மாநிலங்கள் மறுசீரமைப்பு - காமராஜரின் நிர்வாகம் - பக்தவச்சலத்தின் நிர்வாகம் - இந்தி மொழி எதிர்ப்பு போராட்டம் (1965) - தி.மு.க.வின் தோற்றமும் வளர்ச்சியும் - அ.தி.மு.க வின் தோற்றமும் வளர்ச்சியும்.

அலகு 5   **(10-hours)**

    1947க்கு பிறகு தமிழகத்தில் இலக்கியவளர்ச்சி - வேளாண் வளர்ச்சி - தமிழத்தில் தொழில் வளர்ச்சி - தமிழகத்தில் சமுதாய நலத்திட்டங்கள்

பார்வைநூர்கள்:
NAMBI AROORAN	Tamil Renaissance and Dravidian Nationalism 1905-1944.
DAVID ARNOLD	Congress Rule in Tamilnadu: Nationalist Politics in South India 1919-1937
K.RAJAYYAN	History of Tamilnadu (1565-1982)
N. SUBRAMANIAN	History of Tamilnadu (1565-1967)
வெங்கடேசன்	பிற்கால தமிழகவரலாறு
Washbook	Provitional politics in Madras Presidency

நான்காம் பருவம்
இந்தியாவில் சுற்றுலா பொருள்

Contact Hours per Semester: 90 hrs
Hours per week: 6   **Subject Code:** U1HSA41
Credits: 5

நோக்கங்கள் :

* முக்கிய சுற்றாத்தலங்களைப் பற்றிய அறிவினை மாணவர்கள் பெறுதல்
* இந்திய கலாச்சாரம், கைவினைப் பொருட்களைப் பற்றி அறிந்து கொள்ளுதல்

அலகு 1 (20-hours)

சுற்றுலா பொருள் - சுற்றுலா வளங்கள் - மலை வாழிடங்கள் - ஊட்டி - கொடைக்கானல் - கர்நாடகம் - நந்திமலைகள் - மேற்கு வங்காளம் - டார்ஜிலிங் - கேரளா - மூணாறு - இமாசல பிரதேசம் - குளு - மணலி

அலகு 2 (20-hours)

கடற்கரைச்சுற்றுலாத் தலங்கள் - சென்னை மெரினா, மாமல்லபுரம் - கன்னியாகுமரி, வேளாங்கன்னி ராமேஸ்வரம் அந்தமான் நிக்கோபார் தீவுகள் - கேரளா - கொல்லம், பேயம்பலம் கோவளம் - ஏரிகளும், நீர் வீழ்ச்சிகளும் - வரலாற்று நினைவுச்சின்னங்கள் அகழ்வாய்வு இடங்கள் - அருங்காட்சியங்கள் - கலைக் கூடங்கள் - கைவினைப் பொருள்கள்

அலகு 3 (20-hours)

வனவிலங்கு சரணாலயம் - பறவைகள் சரணாலயம் - தேசியப பூங்காக்கள் - கோட்டைகளும் அரண்மனைகளும் - துறைமுகங்கள்

அலகு 4 (20-hours)

புகழ்பெற்ற சமய வழிபாட்டு மையங்கள் - இந்து - புத்த - சமண - கிறிஸ்தவ - இஸ்லாமிய - சீக்கிய வழிபாட்டு மையங்கள்

அலகு 5 (10-hours)

இந்திய நடனங்களும், இசையும் - திருவிழாக்கள் - கண்காட்சி விற்பனை சந்தைகள் - வீரதீர விளையாட்டு சுற்றுலா மையங்கள்

Reference Books:-

1. A.K. Bhatia   -   principles of Tourism
2. L.K. Crampon   -   The Development of Tourism
3. H. Robinson   -   A Geography of Tourism
4. M.P. Bezbaruah   -   Tourism Indian Tourism
6. Humayaun Khan   -   Indian Heritage, Bombay, 1980.
7. Manoj Das   -   India - A Tourist Paradige.
8. J. தர்மராஜ்   -   இந்தியாவில் சுற்றுலாப் பொருள்
9. C. ராமகிருஷ்ணன்   -   இந்திய மரபுச்சுற்றுலா

நான்காம் பருவம்
இதழியல்

Contact Hours per Semester: 30 hrs
Hours per week: 2   **Subject Code:** U1HSS41
Credits: 2

நோக்கங்கள் :

*   * இதழியல் பற்றிய பொதுவான செய்திகளை மாணவர்கள் தெரிந்து கொள்ளுதல்.
*   * விடுதலை இயக்கத்திலும், சமூக சீர்திருத்தங்களிலும் இதழியின் பங்களிப்பினை மாணவர்களுக்கு உணர்த்துதல்.

அலகு 1 (6-hours)

இதழியல் - விளக்கமும் இலக்கணமும் - இதழியல் - நோக்கம் - பணிகள் - கடமைகள் - பொறுப்புகள் - இதழியலின் விதிகள்

அலகு 2 (6-hours)

இதழ்களின் வகைகளும் இயல்புகளும் - இதழியலார்களின் தகுதிகளும் திறமைகளும் - மக்களாட்சியில் இதழியலின் பணிகள்

அலகு 3 (6-hours)

இந்திய இதலியலின் - தோற்றமும் வளர்ச்சியும் - இந்திய விடுதலை இயக்கமும் இதழ்களும் - சமூக சீர்திருத்தத்தில் இதழ்களின் பங்கு

அலகு 4 (6-hours)

தமிழகத்தில் இதழியலின் வளர்ச்சி - விடுதலை இயக்கத்தில் தமிழ் இதழ்களின் பங்கு - சமூக சீர்திருத்தத்தில் இதழ்களின் பங்கு

அலகு 5 **(6-hours)**

செய்தி நிறுவனங்கள் - வரலாற்றுப்பின்புலம் - உலக செய்தி நிறுவனங்கள் - அமெரிக்காவின் அசோசியேடட் பிரஸ் ராய்ட்டர் - ஏஜென்சி பிரான்ஸ் பிரஸ் - யுனைடெட் பிரஸ் இன்டர்நேஷனல் - டாஸ் - இந்திய செய்தி நிறுவனங்கள் - இந்தியாவில் பிரஸ் டிரஸ்ட் - இந்தியாவின் யுனைடெட் நியூஸ் - ஹிந்துஸ்தான் சமாசர் - சாமாச்சர்யவாதி - பத்திரிக்கை மன்றம்

பார்வை நூல்கள்

மா.பா. குருசாமி	-	இதழியல் கலை
ஆ.பி. அந்தோணி இராசு	-	இதழியல் ஓர் அறிமுகம்
ச. கலைவாணி	-	இதழியல் உத்திகள்
மா.ரா. இளங்கோவன்	-	இந்திய இதழ்கள்
பி. குளத்தூரான்	-	தமிழ்ப் பத்திரிகைகள்
இரா. கோதண்டபாணி	-	இதழியல்
அ.மா. சாமி	-	தமிழ் இதழ்கள் தோற்றம் - வளர்ச்சி

நான்காம் பருவம்
தொல்லியல் ஒரு அறிமுகம்

Contact Hours per Semester: 30 hrs

Hours per week: 2   **Subject Code:** U1HSS42

Credits: 2

நோக்கங்கள் :

* தொல்லியலின் முக்கியத்துவத்தை மாணவர்களுக்கு உணர்த்துதல்
* தொல்லியல் வரலாற்றிற்கு எவ்வகையில் உதவுகின்றது என்பதனை மாணவர்களுக்கு புரிய வைத்தல்

அலகு 1 **(6-hours)**

தொல்லியலின் வரலாறு : பொருள் விளக்கம் - மதிப்பும் முக்கியத்துவமும் - வகைகள் - புதிய தொல்லியல் முறை - ஆழ்கடல் அகழாய்வு

அலகு 2 **(6-hours)**

இந்திய தொல்லியல் ஆராய்ச்சியாளர்கள் - அலெக்சாண்டர் கன்னிங்காம் - புரூஸ் புரூட் - சர். ஜான் மார்ஷல் - பிலால் - எஸ்.டி - சாங்கியா - எஸ். ஆர். ராவ் - k.ராஜன்

அலகு 3 **(6-hours)**

தொல்லியலில் தொழில் நுட்ப முறை - கால கணிப்பு முறை - ரேடியோ, கார்பன் - புதிய கண்டு பிடிப்புகள் - மின் அலை, காந்த அலை

அலகு 4 **(6-hours)**

ரெஸ்டிவிடி ஆய்வு - மின் காந்த அளவுகள் - ஒளி பட பதிவு - அகழ் ஆய்வு வகைகள்- ஈமக்காடு - அகழ் வாய்வு

அலகு 5 **(6-hours)**

இந்தியாவில் அகழ்வராய்ச்சி இடங்கள் - மொகஞ்சாதாரோ - ஹரப்பா - நாலந்தா - தன்வார்க் - அரிக்க மேடு - காவிரிப்பூம்பட்டிணம் - ஆதிச்ச நல்லூர் - கொடுமணல் அகழ்வராய்ச்சி பொருட்களை பதப்படுத்துதல் மற்றும் பாதுகாத்தல் - கனிம அடிப்படையில் பதிவு செய்தல்

துணை நூற் பட்டியல்:

1. கே.வி. ராமன் -"தொல்லியல் முறையும், விளக்கமும்" "பாதஜன் வெளியீடு - மதுரை- 5
2. ர. வெங்கட் ராமன் - "இந்திய தொல்லியல்" என்னஸ் வெளியீடு உடுமலை பேட்டை 8
3. கே. ராஜன் - "கொடுமணல் அகழாய்வு - ஓர் அறிமுகம் மனோ, பதிப்பகம், தஞ்சாவூர் 4
4. தொல்லியல் சுடர்கள் -தமிழ்ப் பல்கலை கழக வெளியிடு - தஞ்சாவூர் 2
5. ஸ்ரீதர், வசந்தி" - தமிழக ஆகழ்வராய்ச்சிகள்" தமிழ்நாடு அரசு தொல்லியல் கழக வெளியீடு சென்னை 2010
6. அதியமான் - "நாவாய" தமிழ் பல்கலை கழக வெளியீடு - தஞ்சாவூர் -2010

Course Name : **Master of Arts**

Discipline : **History**

Course Scheme:

Semester	Part	Subject	Hour	Credit	Subject Code	Revision
III	Core 10	Socio-cultural History of Tamilnadu (1800-1967 A.D.)	6	5	P1HSC31	New
	Core 11	Trends in Historical Writing	6	4	P1HSC32	Revised
	Core 12	History of Europe (1453-1789 A.D.)	6	4	P1HSC33	New
	Core 13	Ideas and Movements (From 18th Century to 20th Century)	6	4	P1HSC34	New
	Elective-2	History of World Civilization up to 1453 A.D.	6	5	P1HSE31	New

Semester	Part	Subject	Hour	Credit	Subject Code	Revision
IV	Core 14	Contemporary History of India (1947-2000 A.D.)	6	5	P1HSC41	No Change
	Core 15	Constitutional History of India (1773-1950 A.D.)	6	4	P1HSC42	No Change
	Core 16	Historical Research Methodology	6	4	P1HSC43	New
	Core 17	International Relations (1945-2000 A.D.)	6	4	P1HSC44	Revised
	Elective - 3	Diplomatic History of Europe (1815-1914 A.D.)	6	5	P1HSE41	New

Third Semester

Socio-Cultural History of Tamilnadu, 1800-1967 A.D

Contact Hours per Semester: 90 hrs

Hours per week: 6   **Subject Code: P1HSC31**

Credits: 5

Objectives:

- To have a knowledge about the British economic policy as well as the development of western education and its impacts on society.

- To enrich the knowledge about the socio-economic condition of Tamilnadu and the role of Dravidian movements.

Unit-I   **(15-hours)**

Social conditions: Position of women-sati-child marriage-Devadasi system-Infanticide-changes in the 19th and 20th centuries - Social beliefs and social practices: Social ceremonies-festivels-entertainment-supersitions - Religion:Saivism – st.Ramalingar - Vaishnavism:the Schism-Village gods and deities - Christianity - Growth and Impact-Islam:Growth and Impact.

Unit-II   **(15-hours)**

Land System:Zamindari to Ryotwari-General Economic Conditions:Agriculture and Industry During Colonial and Post –Colonial Periods-Landlords-pesants-small tenant-serfdom-Trading Classes. Rise of indigenous commercial Elite-the Dubashies.

Unit-III   **(20-hours)**

Indigenous Institutions of Learning-Introdution of Western Education-Missionary and Government Education-Munro's Scheme of Education-Professional and Technical Education-Education of Depressed Classes-Muslim education-Female education.

Unit-IV   **(20-hours)**

Modern Socio-religious Movements: Theosophical and Ramakrishna Mission - Radical Social Reform Movements - Periyar E.V.R and Self Respect Movement – Temple Entry Movement – Dalit Movement – Ayothidhas Pandithar – M.C.Raja – Erattamalai Seenivasan.

Unit-V   **(20-hours)**

Music: Folk and Classical-Tamil literature Subramania Bharathi- Bharathidasan-Namakkal Ramalingam Pillai-Kavimani Desika Vinayakam Pillai-Maraimalai Adigal-Film: impact on society and politics.

References books:

Arasarathinam.R	Trade in coramandel Coast
Baker,C.J	The politics of South India (1920 – 1937)
Rajaraman.P	The Justice Party
Rajendran.N	Agitational Politics and state coercoin, National Movement in Tamilnadu 1905-1914.
Subramanian. N	Social History of Tamil
Sundaralingam. R	Politics and Nationalists Awakending in South India 1852-1891
Viswanathan.E.sa	The political Career of Ramaswam Naicker
Washbrook.D.A	The Emergence of Provincial Politics: The Madras Presideney 1870-1920.
Nambi Arroran,	Tamil Renaissance and Dravidian Nationalism 1905 - 1944.

Trends in Historical Writing

Contact Hours per Semester: 90 hrs
Hours per week: 6   **Subject Code: P1HSC32**
Credits: 4

Objectives:
- To understand how developed historical writing from stage to stage.
- To have a knowledge about the factors, which caused the changes in the trends of historical writing.

Unit-I   **(15-hours)**

Meaning and Nature of History: Definition – Scope and Purpose – Art or Science-Uses and Abuse of History – Lessons of History.

Unit-II   **(20-hours)**

Causation and Change: Nature of Causes –Agencies of Changes – Ideas and Change - Theory of Repetition –concept of Progress.

Unit –III   **(20-hours)**

Writing on History : Historical Writing in Ancient Greece – Herototus – Thucydides-Character of Greek Historigraphy – Biblical View of History –St Augustine - Character of Christian Historiogrephy.

Unit-IV   **(20-hours)**

Weshern Historiography 1.Cartesianism- Montesquieu 2 Anti-cartiesanism-Vico 3. Enlightenment-Gibbon 4.Hegal's Philosophy of History 5.Karlmax's Dialectical Materialism-Towards Scientific History-Leo Pold Van Ranke- Oswald Spergler- Toynbee

Unit-V   **(15-hours)**

Historical writing in India: Kalhana,Alberuni, Abulfazl - Sadunath sarkar, K.A. Nilakanda sastri- K.Rajayyan

Reference Book:

1.	K.RAJAYYAN	:	History in theory and method
2.	B.Sheik Ali	:	History :city theory and method
3.	S.Manickam	:	Theory of History and method of research
4.	G.Venkatesan	:	Historiography

History of Europe 1453-1789 A.D

Contact Hours per Semester: 90 hrs

Hours per week: 6   **Subject Code: P1HSC33**

Credits: 4

Objectives:

- To have a comprehensive study of the first phase of History of Modern Europe.
- To learn about the enlighten monarchs of Europe.

Unit-I   **(15-hours)**

Beginning of Modern Age-Geographical Discoveries-results-Importance of the year 1453-Transition from Medieval to Modern age.

Unit-II   **(5-hours)**

Renaissance in Italy – Literacy Renaissance - Francesco –Pertrorc, Giovanni Boccascio-Renaissance, in arts - Leonardo-da- Vinci, Raphel - Michelangelo-Venetian school of painting – Effects of Renaissance.

Unit III   **(20-hours)**

Reformation, in Germany - Martin Luther - The Edict of worms, causes of the success of Reformation – Effects of the Reformation – the Counter Reformation - Hentry VIII of England-Charles V –Phillip II of Spain-Thirty Year War.

Unit IV   **(20-hours)**

Character of the Monarchy of XIV Louis - Achievements of Louis XIV in Domestic Affairs - wars of Louis X IV – The Dutch war - Treaties - League of Augsburg - The War of Spanish succession - The treaty of Ulrecht of 1713, Results of the war of Spanish succession - Achievements of Louis X IV in Foreign affairs - Religious Policy of Louis X IV - Fredrick the Great

Unit-V   **(20-hours)**

The War of Austrian succession-Maria Theresa and her Foreign policy - Domestic policy, Joseph II is reforms - Peter the Great – Economics and Foreign measures of the Peter the Great -

Catherine II and Englightenedmonarchy - Unrest in Europe – Impact of the American war of Independence-Louis XVI of France.

Reference of Books:

1.	Arun Bhattacharee	:	History of Europe (1453-1789)
2.	B.V.Rao	:	History of Europe (1453-1815)
3.	A.C.Fisher	:	History of Europe
4.	A.J.Grant	:	History of Europe
5.	M.A.L.Fisher	:	Europe in 19th & 20th centuries
6.	Southgate	:	History of Moderm Europe from 1789.

IDEAS AND MOVEMENTS (From 18th Century to 20th Century)

Contact Hours per Semester: 90 hrs
Hours per week: 6   **Subject Code: P1HSC34**
Credits: 4
Objectives:
- To have a comprehensive study of the various Political Philosophies.
- To provide knowledge about the political thoughts.

Unit –I   **(15-hours)**
        Origin-nature-theories-value of political ideas-Plato-Aristotle- St.Augustine -Reformation - Transition form Medieval to Modern – Machiavelli.

Unit-II   **(30-hours)**
        Hobbeis Philosophy of Absolutism- Jean Bodin's Limited sovereignty - John Locke's Natural rights – Montesquieu,s - Separation of powers – Rosseau's social Contract- Glorious Revolution – Bill of Rights- American Declaration of Independence- Articles of Confederation – Concept of Liberty – Equality and Fraternity.

Unit-III   **(15-hours)**
        Utilitarianism: Bentha and J.S.Mill Idealism: Immanuel Kant and Thomas Green- Spencer's individualism- Socialism.

Unit-IV   **(15-hours)**
        Totalitarianism: Nazism, Fascism, Marxism in theory and Practice- Germany, Italy, Russia and China

Unit-V   **(15-hours)**
        Democratic Ideas and Movements: Laski's Pluralism –Enlightened Capitalism- Democratic Socialism- Gandhi's Ahimsa and Sarvodaya .

Reference books:

1.	Amal Kumar	:	Western political thought
2.	Bhandari D.R	:	History of European Political Philosophy
3.	David P.Barash	:	Introduction to peace Studies
4.	Ebenstein W	:	Great political Thinkers
5.	Das.P.G	:	History of Political thought

HISTORY OF WORLD CIVILIZATION UPTO 1453A.D

Contact Hours per Semester: 90 hrs
Hours per week: 6   **Subject Code: P1HSE31**
Credits: 5

Objectives:

- To have a comprehensive study of the world civilizations and cultures.
- To understand the various laws and ways followed   the maintain peace during ancient and medieval period.

Unit-I   **(20-hours)**

Civilization: Definition- factors influencing the Growth of Civilization – Difference between Civilization and culture - Egyptian civilization: Geography- the people- Government- social and economic conditions – Arts –Religion – Literature and Learning.

Unit-II   **(20-hours)**

Babylonian Civilization: Geography – the people – Government – Hammurabi – social and economic conditions –Arts, Religion –Literature and Learning - Legacy of the Greek Civilization: Political Legacy – legacy in the fields of art, architecture, religion, philosophy, literature, education and science.

Unit-III   **(15-hours)**

Legacy of Roman Cilivilization: political legacy- Roman Law- Legacy in the fields of arts, architecture, religion, philosophy, literature, education and science,

Unit-IV   **(20-hours)**

The Byzantine Civilization: Government – Emperor Justinian – social and economic conditions – contributions to arts, religion and philosophy - Feudalism: causes – features – feudal setup – feudal services- feudal – incidents- merits and demerits of feudalism – decline of feudalism – manorial system.

Unit-V   **(15-hours)**

Religions: Christianity – life and teachings of Jesus Christ – life and Teachings of prophet Muhammad- Hinduism – Zoroastrianism- Confucianism

Reference Books
1.Arnold Toynbee -A study of History
2.J.E. Swain   - A History of World Civilization
3.Will Durant   - A Story of Civilization

Fourth Semester
CONTEMPORARY HISTORY OF INDIA (1947-2000 A.D)

Contact Hours per Semester: 90 hrs
Hours per week: 6   **Subject Code: P1HSC41**
Credits: 5

Objectives:

- To understand the foreign policy of India.
- To know about the socio- economic position of contemporary India.

Unit-I   **(15-hours)**

Framing of the Constitution and its salient features – Patel and the Integration of States – Linguistic formation of the States – Integration of French and Portuguese territories – creation of New states and Union Territories up to 2000 A.D.

Unit-II   **(15-hours)**

India's foreign policy: Pancha Sheela – Non-alignment – Relationship with U.S.A and U.S.S.R- Relationship with Pakistan, China, Ceylon – India and the U.N.O – India and the SAARC.

Unit-III   **(20-hours)**

Socio- Economic development: Constitutional measures for the welfare of the S.C, S.T and Backward class _Reservation Policy- Kaka Kalelkar commission – Mandal commission-Ilaiyaperumal commission – protection of minorities – promotion of women's welfare - Five Year Plans – Green Revolution White revolution – Blue Revolution Industrial and Commercial Progress – Privatization – Globalization and its Impact.

 Unit-IV   **(20-hours)**

Growth of Education and Art : Dr.Radhakrishnan commission (1948) – A.L Mudaliar commission – Kothari commission – New Educational policy (1986)- Mass literacy – University Grants Commission- NCERT. Art – literature – Festivals – International Cultural relations: organization for the promotion of cultural activities – sports.

Unit-V   **(20-hours)**

Threats to National Integration: Religious Fundamentalism – Babari Masjid Issue – Separatism - Communalism – Casteism – Multiparty System – Collation Government Inter State disputes.

Reference Books

Agrwal, J.C   -A source book of Indian Education.
Desai,Neera   -Women in Modern India.
Deshmukh, C.D-Economic Development of India 1946-56, A personal
                          Retrospect, Bombay, 1957.
Gadgil, D.R   -Planning and Economic Policy in India Pune, 1957.
Gopal, S.(Ed)   -Anatomy of confrontation:The Babri masjid-Ram
                          Janma Bhumi issue 1991.
Kaul, J.N   -Higher Education in India 1951-71:the Decades of.
                          Planned Drift, Simla,1974.
Menon V.P   -The story of Integration of India states.
Nirmala Jeyraj   -Higher Education-vision and mission for Twenty
                          First century, Madurai 1988.
Pachavi R.K (ed)   -Contemporary India.
Venkatesan, G.   – Contemporary History of India 1947-200 A.D.

CONSTITUTIONAL HISTORY OF INDIA (1773- 1950 A.D)

Contact Hours per Semester: 90 hrs

Hours per week: 6   **Subject Code: P1HSC42**

Credits: 4

Objectives:

- To have a broad view about the constitutional development in India.
- To enable the students to prepare for competitive examinations.

UNIT 1   **(15-hours)**

The Regulating Act of 1773 –The Act of 1781-Pitt''s India Act of 1784 - Sircumstances-Provisions-Significances.

UNIT 2   **(20-hours)**

The Charter Act's of 1793,1813,1833,1853 -The Act of 1858- Queen's proclamation of 1858 –Circumstances-Provisions-Significances.

UNIT 3   **(20-hours)**

Indian Councils Act of 1861 to 1872-Minto-Morley Reforms of 1909-Montague Chelmsford Reforms of 1919 – Circumstances – Provisions – Significances - Dyarchy in provinces.

UNIT 4   **(20-hours)**

The Government of India Act of 1935- Circumstances – Provisions - Significances-Constitutional Development between 1935 and 1950-The formation of Constitutional Assembly-The Act of 1947-The Making of Constitution.

UNIT 5   **(15-hours)**

The Salient Features of the Indian constitution-The Sources-Federation-Fundamental Rights-Fundamental Duties - The Directive principles - The Judiciary – Emergency - Procedure of Amendment Centre - State relations

REFEENCES BOOKS:

R.C .Agarwal, Constitututional Development and National movement of India

D.C. Gupta, Indian National movement and constitutional Development

S.C. RaiChaudry, History of modern India

B.L. Grover,A New Look on Modern Indian History

HISTORICAL RESEARCH METHODOLOGY

Contact Hours per Semester: 90 hrs

Hours per week: 6   **Subject Code: P1HSC43**

Credits: 4

Objectives:

- To provide entry level knowledge in research methodology.
- To give confidence to the students to enter into the research field.

UNIT 1   **(15-hours)**

Research – meaning-Historical Research- Sources for Historical Research –Varieties of Sources –Sources of Ancient, Medieval and Modern History.

UNIT 2   **(20-hours)**

Methodology of Research: Historical method –Selection of Research topic-   Requisites of a Research scholar-working Hypothesis Design – Research Proposal.

UNIT 3   **(20-hours)**

Collection of Data - Bibliography Method - Recording of Evidence-card file-analysis of Data-External Criticism - Internal Criticism.

UNIT 4   **(20-hours)**

Organization of Research Work:-Facts and synthesis-Interpretation and reasoning-Exposition and style - Quotations - Statistical method – objectivity - subjectivity.

UNIT 5   **(15-hours)**

        Presentation of Thesis format of the thesis-paper-margin-spacing-order of presentation-Footnotes – Kinds of footnotes Abbreviation – italics - date and figures.

REFERENCE BOOKS:

Fling, F.H- The writing of History

Froude, J.A -Scientific Method applied to History

Nilakanda sastri, K.A- Historical Method

Shafter, R.J-A Guide to Historical Method

Rajayyan, K-History in Theory and Method

Sheik Ali-History in Theory and Method

Manickam, S-Theory of History Method of Research

Venkatesan, G-Historiography

International Relations (1945-2000A.D)

Contact Hours per Semester: 90 hrs

Hours per week: 6   **Subject Code: P1HSC44**

Credits: 4

Objectives:

- To create consciousness among the students about UNO as an international platform for peace.
- To get an insight into major issues concerning world polity.

UNIT 1   **(15-hours)**

        Foundation of U.N.O - the Charter - its Structure - Specialized Agencies - Achievements of the U.N.O-organization, fundamental of the U.N.O - Future of the U.N.O

UNIT 2   **(20-hours)**

        The Cold War – causes – Evolution - Palestine Issue - Kashmir Issue - Korean Issue - Racial Discrimination in South Africa – Impact of the Cold War – Disarmament – Objectives of Arms control-difficulties and obstacles in the way of Disarmament-partial Test Ban treaty-Nuclear Non-Proliferation Treaty-SALT l, SALT ll- Chemical Weapons Conventions

UNIT 3   **(20-hours)**

        Common Wealth of Nations-NAM-SAARC-EEC-OPEC-GI5-WTO-Third world in international Relations-its goal-impact of Third world international Relation

UNIT 4   **(20-hours)**

        German problem-partition-efforts for the Reunification-Berlin problem-Reunification of Germany-Gorbachev and USSR-his reforms-split of USSR

UNIT 5   **(15-hours)**

The Gulf war –attack on world Trade centre-Afghan war-Taliban problem-spread of Terrorism-efforts to control the terrorism

BOOKS REFERENCE

1. Palmer and Perkins-International Relations power politics and international organizations
2. Fleming- Origin of the cold war
3. Samarsen -power politics and international organizations
4. Singh-Emerging international order-Non-Alignment movement
5. V.K.Malhotra-International Relations

Diplomatic History of Europe-A.D 1815-1914 A.D

Contact Hours per Semester: 90 hrs

Hours per week: 6   **Subject Code: P1HSE41**

Credits: 5

Objectives:

- To enable the students to understand   the European diplomacy.
- To study how the secret diplomacy caused the out break of the First World War.

Unit -1   **(20-hours)**

Diplomacy: Meaning and Definitions- Kinds of Diplomacy- Diplomacies through Congresses- The congress of Vienna 1814-1815- The Concert of Europe 1815-1825- The Congress of Aix-la- Chappelle- The Congress of laibach- The Congress of Troppeu- The Congress of Verona- Causes for the failure of the concert of Europe- The part played by Castlereagh and canning.

Unit-2   **(20-hours)**

Diplomacies Era of Metternich- Diplomacy of Cavour- Unification of Italy- The Diplomacy of Bismarck- Unification of Germany- The Congress of Berlin 1878- The diplomacy of Disraeli- The three emperors league of 1873.

Unit -3   **(20-hours)**

The Era of Elliances: The formation of the Dual Alliance- The formation of the Dual Entente- The development of Triple Alliance and Triple Entente - The division of Europe in two camps- The Significance of secret diplomacy.

Unit-4   **(15-hours)**

The Crises and Diplomacy: The Morocco Crisis 1905-1912- The Algeciras Conference 1906- The Casablanca Incident 1908- The Agardir Crisis 1906- The London Conference 1911-1912.

Unit-5   **(15-hours)**

The First World War: The Great War and Diplomacy- Diplomacy of War- Diplomacy of Poer- Diplomacy of Ideology- Objectives of the War and the Peace Proposals.

Text books

1. Fisher, H.A.L. A history of Europe.
2. Grant and Temporally. Europe in the nineteenth and Twentieth Centuries
3. Hayes. Modern Europe upto 1870.
4. Kettlebey C.D.M. A History of Modern times.
5. Lipson E. Europe in the nineteenth and Twentieth Century's.
6. Nicoloson, Philips, A. Diplomacy in Modern Europe 1815-1899.
7. Rene Albrecht Carrio. A Diplomatic History of Europe since the congress of viena.
8. Santag, R.J. European diplomatic History 1871-1918.
9. Thompson. Europe since Napolean

Course Name: **Bachelor of Commerce**

Discipline: **Commerce**

COURSE SCHME:

Semester	Part	Subject	Hours	Credit	Int. + Ext. = Total	Subject Code	Revision
Third	III	Allied III – Business Statistics	6	5	25+75 = 100	U1CMA31	No change
	III	Elective – I – Banking Law & Practice	6	5	25+75 = 100	U1CME31	Revised
	III	Financial Accounting – III	6	4	25+75 = 100	U1CMC31	Revised
	III	Business Correspondence	5	4	25+75 = 100	U1CMC32	Revised
	III	Salesmanship	5	4	25+75 = 100	U1CMC33	Revised
	IV	SBE I– Fundamentals of Computers	2	2	25+75 = 100	U1CMS31	No Change

Semester	Part	Subject	Hours	Credit	Int. + Ext. = Total	Subject Code	Revision
Fourth	III	Allied IV – Business Mathematics	6	5	25+75 = 100	U1CMA41	Revised
	III	Cost Accounting	5	4	25+75 = 100	U1CMC41	Revised
	III	Company Organization	5	4	25+75 = 100	U1CMC42	New
	III	Advertising	5	4	25+75 = 100	U1CMC43	Revised
	III	Financial Accounting – IV	5	4	25+75 = 100	U1CMC44	Revised
	IV	SBE – II MS-Office	2	2	25+75 = 100	U1CMS41	New
	IV	SBE – III Lab: MS-Office	2	2	40+60 = 100	U1CMS4P1	Revised

Year	Part	Subject	Hour	Credit	Code
I & II	Part V	NSS/ NCC/ Physical Education – Sports	-	1	U1NS1/ U1NC1/ U1PS1

SECOND YEAR   III – SEMESTER
BUSINESS STATISTICS

Hours: 6hrs/week   90 Hrs   Sub.Code:U1CMA31
Credits: 5

OBJECTIVE:
        To provide basic skills on the usage of statistical tools to analyze business data.

UNIT – 1   (18-hours)
        Statistics: definition – functions – importance – limitations – methods of collection of data: primary – secondary – sampling: meaning – methods – classification and tabulation: meaning – types of classification – tabulation of data – difference between classification and tabulation – rules for tabulation - diagrammatic and graphic representation.
UNIT – 2   (18-hours)
        Arithmetic mean – geometric mean – harmonic mean – median – mode.
        Range – quartile deviation – mean deviation – standard deviation – co-efficient of variation (combined standard deviation excluded).
        Skewness – methods – Karl pearson's co-efficient of skewness – Bowley's co-efficient of skewness.
UNIT – 3   (18-hours)
        Correlation – Scatter diagram – Karl pearson's co-efficient of correlation – Rank correlation (concurrent deviation method excluded)
UNIT – 4   (18-hours)
        Regression analysis – regression equation – least square method – actual mean method.
        Index number – types – tests – consumer price index number.
UNIT – 5   (18-hours)
        Analysis of time series – components – methods of determining trend – graphic – semi average – moving average – least square.

TEXT BOOKS
    1. R.S.N. Pillai and V. Bagavathi – Statistics
    2. K. Alagar - Business statistics
REFERENCE BOOKS
    1. S.P. Gupta- Business statistics
    2. Sancheti kapoor - Statistics – theory , methods and application

Question paper should provide 80% credit to problems and 20% credit to theory.

SECOND YEAR   **III – SEMESTER**

BANKING LAW AND PRACTICE

Hours: 6hrs/week 90 Hrs   **Sub.Code: U1CME31**
Credits:5
OBJECTIVE:
    To provide basic knowledge on the banking law and practice

Unit - 1   **(18-hours)**
    Origin of Banking – Banker and Customer: General and special relationship – Types of Customers – key norms - Procedures and Practices in opening and conducting the accounts of customers – Different types of deposits – Commercial Banks- Functions – Reserve Bank of India – functions of RBI.

Unit - 2   **(18-hours)**
    Pass Book – Cheques - features, types – Crossing – Endorsements – Material alterations.

Unit – 3   **(18-hours)**
    Payment Banker – Holder –Holder in due course – Payment in due course – Statutory protection – Duties – Collecting banker – Statutory protection – Duties.

Unit - 4   **(18-hours)**
    Bank Lending – General principles of sound lending – secured Vs Unsecured Advances – Types of Advances: OverDraft, CC, Hypothecation, Pledge and Mortgage.

Unit – 5   **(18-hours)**
    E-Banking – Internet Banking - Home Banking – Mobile Banking – virtual Banking – ATM – Credit card – Debit card – NEFT – RTGs

TEXT BOOK
1. Banking Theory Law and Practice – Gordern & Nadarajan

REFERENCE BOOKS
   1. Maheshwari, S.N: Banking Law and Practice
   2. Shekar.K.C: Banking Theory Law and Practice
   3. Lan Nigam, R.M: Law and Practice of Banking
   4. Radhaswamy & Vasudevan: Text Book of Banking.
   5. Varshaney: Banking Law and Practice.
   6. Devat, S.R.: Law and Practice of Banking.
   7. Dr. P.N.Reddy & H.R.Appannaiah: Banking theory and Practice

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SECOND YEAR   **III – SEMESTER**

FINANCIAL ACCOUNTING - III

Hours: 6hrs/week   90Hrs   **Sub.Code: U1CMC31**
Credits: 4

OBJECTIVE:
    To provide knowledge on accounting for Fire insurance claims, Royalty, Insolvency, Hire purchase and Investments.

UNIT – 1   **(18-hours)**
    Fire insurance claims – loss of stock policy – consequential loss or loss of profit policy – application of average clause

UNIT – 2   **(18-hours)**

Royalty accounts – accounting treatment in the books of lessor and lessee – sub-lease

UNIT – 3 **(18-hours)**

Insolvency accounts – individual and firm – statement of affairs – deficiency account

UNIT – 4 **(18-hours)**

Sale or return basis – investment account – Voyage account.

UNIT – 5 **(18-hours)**

Hire purchase accounting – calculation of interest – cash price – accounting treatment in the books of hire purchaser and hire vendor – default and repossession – hire purchase – trading account – (debtors method only) Installment purchase system – accounting treatment in the books of buyer and seller

TEXT BOOKS
1. Financial accounting – S.Manikandan & R. Rakesh Shankar
2. Advanced accountancy – T.S.Reddy and A.Murthy
3. Advanced accounting – R.S.N.Pillai & Bagavathy

REFERENCE BOOKS
1. Advanced accountancy – R.L.Gupta & Radhaswamy
2. Advanced accounts – S.P.Jain & K.L.Narang
3. Advanced accountancy – M.A.Arulanandam & K.S.Raman
4. Advanced accountancy – S.N.Maheswari & S.K.Maheswari
5. Advanced accountancy – P.C.Tulsian
6. Advanced accounts – M.C.Shukla and T.S.Grewal

Note: the questions should be asked in the ratio of 80% for problems and 20% for theory.

SECOND YEAR III – SEMESTER
BUSINESS CORRESPONDENCE

Hours: 5hrs/week 75 Hrs **Sub.Code: U1CMC32**
Credits:4
OBJECTIVE:

To provide skills in writing business letters reports in English.

Unit – 1: **(15-hours)**

Nature and Importance Business Correspondence – Qualities of a good business letter – Types of business letter – Structure and Layout

Unit - 2: **(15-hours)**

Mission statement – career objectives - Job application Letter and Resume –order of appointment - Letter of Acceptance – Relieving order - Letter of resignation

Unit - 3: **(15-hours)**

Requests for quotations, Offer letters – Purchase order – Complaints and Adjustment letters- Collection letters.

Drafting of sales letters, circular letters preparations of market survey reports.

Unit - 4: **(15-hours)**

Bank Correspondence - Insurance Correspondence - Agency Correspondence - Correspondence with Shareholders, Directors.

Unit - 5: **(15-hours)**

Messages through electronic media – SMS – email- Representations to Government, Trade associations, and Public authorities

TEXT BOOKS
1. Essentials of Business Communication - Rajendra Pal and J. S. Korlhalli - Sultan Chand & Sons, New Delhi.
2. Business Correspondence – R.S.N. Pillai & Bagavathi

REFERENCE BOOKS
1. Business Correspondence and Report Writing - R. C. Sharma, Krishna Mohan - Tata McGraw-Hill Publishing Company Limited, New Delhi.
2. Business Communication (Principles, Methods and Techniques) Nirmal Singh - Deep & Deep Publications Pvt. Ltd., New Delhi.
3. Business Communication - M. Balasubrahmanyan - Vani Educational Books.
4. Business Communication - K. K. Sinha - Galgotia Publishing Company, New Delhi.
5. Business Communication - Dr. S.V. Kadvekar, Prin. Dr. C. N. Rawal and Prof. Ravindra Kothavade - Diamond Publications, Pune.
6. Modern Business Correspondence - L. Gartside - The English Language Book Society and Macdonald and Evans Ltd.
7. Creating a Successful CV - Siman Howard - Dorling Kindersley.

SECOND YEAR   III – SEMESTER
SALESMANSHIP

Hours: 5hrs/week 75 Hrs   **Sub. Code: U1CMC33**
Credits:4

OBJECTIVE:
   To provide salesmanship skills to the students in addition to theoretical knowledge on selling and sales management.

UNIT – 1   **(15-hours)**
Salesmanship – meaning – definition – nature – objectives – salesmanship and marketing mix – salesmanship Vs advertising.
UNIT – 2   **(15-hours)**
Features of Salesmanship – fundamental qualities – knowledge of the product – knowledge of buying motives - knowledge of customers.
UNIT – 3   **(15-hours)**
Selling approach – types of salesmen – characteristics of a successful salesman – AIDA theory of selling – process of selling.
UNIT – 4   **(15-hours)**
Sales planning – function of sales management – sales planning process – sales forecasting – sales budget – sales quotes – sales territories.
UNIT – 5   **(15-hours)**
Sales force management – recruitment – selection – training – directing – motivating – compensation – performance appraisal – sales control – Sales Force Automation   (SFA).
 TEXT BOOK

1. Advertising and personal selling – C.B.Gupta – Sultan Chand & Sons

REFERENCE BOOKS

1. Salesmanship – Bholanath Dutta; Girish C. Himalaya publishing house
2. Salesmanship and publicity – Rustom S. Davar Sohrab R.Davar Nusli R.Davar – Vikas publishing house

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SECOND YEAR   III – SEMESTER

FUNDAMENTALS OF COMPUTER

Hours: 2hrs/week 30 Hrs   **Sub. Code: U1CMS31**
Credits:2

OBJECTIVE:
        To provide fundamental knowledge on the computer hardware and software so that the student can handle computer as an office equipments.

UNIT – 1   **(6-hours)**
        Introduction to Computer - Definition, Characteristics.. Generation of Computers, Capabilities and Limitations. Basic Components of a Computer System-Control Unit, ALU, Input/output functions and characteristics. Memory Volatile Memory and Non- Volatile , Flash Memory, ROM, RAM, EPROM, PROM, EEPROM other types of memory.

UNIT – 2   **(6-hours)**
        Input Units - Computer Keyboard, Pointing Devices: Mouse, Trackball, Touch Panel, and Joystick, Light Pen, Scanners, Various types of Monitors, Touch-sensitive screens, Optical Recognition System, Pen based systems, Digitizers, MICR, OCR, OMR, Bar-code Reader, digital camera.

UNIT – 3   **(6-hours)**
        Output Devices - Hard Copy Devices:- Impact and Non- Impact Printers- Dot Matrix, Line Printer, Non Impact Printers- DeskJet, Laser Printer, Thermal Transfer Printer, Barcode Printers, Electro static printers and plotters.

UNIT – 4   **(6-hours)**
        Software and its different types- Application Software, System Software. OS – BIOS – Booting files. Firmware, Compiler, Interpreter and Assembler. File Allocation Table (FAT, FAT 32 & NTFS) – High Level Language and Low Level Language,

UNIT – 5   **(6-hours)**
        Introduction to algorithm and Flow chart: - Representation of an algorithm, flowchart symbols and levels of flow chart, rules, advantage and limitations of flowchart and pseudo code.

TEXT BOOK

1. BalaGurusamy – Fundamentals of computer

REFERENCE BOOKS

1. Alexis Leon and Mathews Leon (1999):Fundamentals of information technology, Leon Techworld Pub.
2. K.S.Suresh Basandra - Computers today
3. Rajaraman, V. - Fundamentals of Computers, Prentice Hall India.
3. Sinha - Computer Fundamentals, BPB Pub.

SECOND YEAR   **IV – SEMESTER**
BUSINESS MATHEMATICS
Hours: 6hrs/week   90 Hrs   **Sub.Code: U1CMA41**
Credits:5

OBJECTIVE:

         To provide computational skills on sets, indices, differential calculus, integral calculus and matrices and to apply them in solving business problems.

UNIT – 1   **(18-hours)**

         Theory of sets: Definition – Finite and infinite sets – description of sets – singleton set – null set – subset – equality of sets – disjoint sets – Set operations: Union of sets – intersection of sets – difference of sets – complement of a set – venn diagram – law of sets: cumulative law - associate law – distributive law – demorgan's laws (properties excluded) – number of elements in a set

UNIT – 2   **(18-hours)**

         Indices: laws of indices (proof excluded) – negative index – zero and unity index – fractional index –Simple interest – compound interest calculations.

UNIT – 3   **(18-hours)**

         Differential calculus: differentiation – derivative of x^n, e^x, $\log e^x$, $\sin x$, $\cos x$, $\tan x$, $\cot x$, $\sec x$, $\csc x$, a constant, ku, where k is a constant and u is a function (formulae only) – derivative of sum of two functions – product rule – quotient rule (formula only) – maxima and minima: definition – criteria for maxima and minima – working rule.

UNIT – 4   **(18-hours)**

         Integral calculus – standard results – integrals of function containing linear function of x (formula only) – (standard results of $\sin x$, $\cos x$, etc excluded) – integration by substitution.

UNIT – 5   **(18-hours)**

         Matrices: Definition – order – types (Skew symmetric excluded) – operations on matrix: addition, subtraction – product of two matrices.

         Determinant of a matrix: definition – expansion of a determinant – (minors and cofactors – singular – non-singular – properties of determinants excluded) – inverse of matrix – simultaneous linear equations.

TEXT BOOKS
1. Dr. M.Manoharan, Dr. C.Elango, Prof. K.L.Eswaran - Business Mathematics
2. Sancheti and Kapoor - Business mathematics

REFERENCE BOOKS
1. V.Sundaresan & Jeya seelon - Business mathematics
2. P.R.Vittal - Business mathematics
3. R.S. Soni - Essential business mathematics & business statistics
4. A.P. Verma - Business mathematics
5. N.G. Das - Business mathematics and statistics
6. N.K.Nag - Business mathematics

Question paper should provide 80% credit to problems and 20% credit to theory.

SECOND YEAR   **IV – SEMESTER**
COST ACCOUNTING
Hours: 5hrs/week 75 Hrs   **Sub.Code: U1CMC41**
Credits: 4

OBJECTIVES
- To acquaint the student with basic concepts used in cost accounting and various methods involved in cost ascertainment.
- To provide knowledge on the use of costing data for planning, control and decision-making

UNIT – 1   **(15-hours)**
Introduction: Meaning, Objectives and advantages of cost accounting, difference between cost accounting and financial accounting. Cost concepts and Classification, cost unit, cost centre, cost object – Cost sheet.

UNIT – 2   **(15-hours)**
Accounting and Control of material cost: Issue of materials – Bin card - Methods of Pricing of material issues-FIFO, LIFO, Weighted Average, Inventory Control- Concept and techniques like fixing of stock levels, EOQ, ABC analysis- Material losses and their treatment.

UNIT – 3   **(15-hours)**
Labour: Time Rate and Piece Rate System – Incentive plans: Halsey, Rowan, Taylor and Merrick plans – Labour Turnover: Causes and methods.

UNIT – 4   **(15-hours)**
Overheads: Classification, allocation, apportionment and absorption of over head. Treatment of over and under absorption. Reconciliation of cost and Financial Accounts.

UNIT – 5   **(15-hours)**
Methods of costing - Contract Costing- Process Costing – Abnormal Loss – Abnormal Gain - Process Accounts – Cost Audit : Meaning, importance.

TEXT BOOKS
1. RSN Pillai & Bagavathi - Cost accounting.
2. R. Murthy & S. Gurusamy - Cost accounting.

REFERENCE BOOKS
1. S.P. Jain and K.L. Narang, Cost Accounting, Principles and Methods, Kalyani Publishers, Jalandhar
2. S.P.Iyengar - Cost accounting principles & practice
3. B.M. Lall Nigam & I.C. Jain - Cost accounting on introduction
4. M.N. Arora - Cost accounting principles and practice
5. P.C.Tulsian - Cost accounting

Question paper should provide 60% credit to problems and 40% credit to theory.

SECOND YEAR   IV – SEMESTER
COMPANY ORGANIZATION

Hours: 5hrs/week 75 Hrs   **Sub.Code: U1CMC42**
Credits:4

OBJECTIVE:
To enable the students to get familiarized with the existing Company Law and Secretarial Procedures.

UNIT – 1   **(15-hours)**
Company: Meaning and definition, Kinds of Companies – Limited and unlimited, private and public, government companies, statutory companies.

UNIT – 2   **(15-hours)**
Formation of Companies: Promotion, incorporation, capital, subscription, commencement of Business – Authorities: MCA and its importance.

UNIT – 3   **(15-hours)**
Documents of Companies:

Memorandum of Association – definition, clauses, provisions and procedures for alteration. Articles of Association – definition, contents, provisions and procedures for alteration, Distinction between Memorandum and Articles of Association - Prospectus – Contents – Statements in Lieu of Prospectus.

UNIT – 4   **(15-hours)**
Management of Companies: Appointment, Qualification, Rights, Responsibilities and liabilities of Directors, Managing Director.

UNIT – 5   **(15-hours)**
Meetings: Statutory, Annual, Extra ordinary and Board Meetings, Resolutions – Types.

TEXT BOOKS
1. N.D. Kapoor : Company Law and Secretarial Practice
2. R.S.N.Pillai & Bagavathi – Business law
3. Tulsian – Business law

REFERENCE BOOKS
1. M.C. Shukla & Gulshan : Principles of Company Law.
3. M.C. Bhandari: Guide to Company Law Procedures.
4. Tuteja : Company Administration and Meetings.
5. S.C. Kuchehal : Company Law and Secretarial Practice.
6. Dr. P.N. Reddy and H.R. Appanaiah: Essentials of Company Law and Secretarial Practice, Himalaya Publishers.
7. M.C Kuchchal, Secretarial Practice.
8. Ashok Bagrial, Secretarial Practice.

SECOND YEAR   **IV – SEMESTER**

ADVERTISING

Hours: 5hrs/week 75 Hrs   **Sub.Code: U1CMC43**
Credits: 4
OBJECTIVE:

To provide basic knowledge on advertisements, agency, media, advertising message and evaluation.

UNIT – 1   **(15-hours)**

Advertising – meaning – advertising Vs publicity – nature of advertising – importance/ benefits of advertising – types of advertising - criticism against advertising.

UNIT – 2   **(15-hours)**

Advertising media – meaning – types – print media – audio visual media – direct mail – outdoor advertising - On line advertising – Mass Mailer - specialty advertising media – media planning.

UNIT – 3   **(15-hours)**

Advertising message – advertising copy – qualities of good advertising copy – elements of adverting copy – types of advertising copy – advertising copy for different media - designing advertising copy.

UNIT – 4   **(15-hours)**

Advertising agency – meaning – functions – types of agencies – organizational structure – benefits of advertising agency – selection of an advertising agency – compensation for agency service.

UNIT – 5   **(15-hours)**

Advertising effectiveness – objectives of measuring advertising effectiveness – times of measuring – testing the advertising copy – subject matter of measurement – ethical issues in advertising –effects – need.

TEXT AND REFERENCE BOOK

1. Advertising and personal selling – C.B.Gupta Sultan Chand & Sons

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SECOND YEAR   **IV – SEMESTER**

FINANCIAL ACCOUNTING – IV

Hours: 5hrs/week 75 Hrs   **Sub.Code: U1CMC44**
Credits: 4
OBJECTIVE:

To provide comprehensive knowledge on accounting for partnership firms.

UNIT – 1   **(15-hours)**

Partnership accounts – partnership – definition – Partnership Deed – Registered firm and unregistered firm implication - provisions relating to partnership accounting – capital and current accounts of partners – fixed and fluctuation – appropriation of profits – past adjustments and guarantee – final accounts of firms

UNIT – 2   **(15-hours)**

Admission of new partners – calculation of new profit sharing ratio and sacrificing ratio – adjustment of undistributed profits, losses and reserves – revaluation of assets and liabilities –

treatment of goodwill (As per AS – 10) – adjustment of capitals of partners after admission of a partner.

UNIT – 3   **(15-hours)**

Retirement of partners – transfer of balance due to retired partner – gaining ratio - purchase of retired partner's share by the remaining partners – death of a partner – treatment of joint life policy – settlement of amount due to legal representatives of deceased partner

UNIT – 4   **(15-hours)**

Dissolution of partnership – accounting treatment – insolvency of a partner – decision in Garner Vs Murray case – insolvency of all partners – piecemeal distribution – proportionate capital method – maximum loss method

UNIT – 5   **(15-hours)**

Amalgamation of firms and Sale to a company

TEXT BOOKS

1. Financial accounting – S.Manikandan & R. Rakesh Shankar
2. Advanced accountancy – T.S.Reddy and A.Murthy
3. Advanced accounting – R.S.N.Pillai & Bagavathy

REFERENCE BOOKS

1. Advanced accountancy – R.L.Gupta & Radhaswamy
2. Advanced accounts – S.P.Jain & K.L.Narang
3. Advanced accountancy – M.A.Arulanandam & K.S.Raman
4. Advanced accountancy – S.N.Maheswari & S.K.Maheswari
5. Advanced accountancy – P.C.Tulsian
6. Advanced accounts – M.C.Shukla and T.S.Grewal

Question paper should provide 80% credit to problems and 20% credit to theory.

SECOND YEAR   **IV – SEMESTER**

MS-OFFICE THEORY

Hours: 2hrs/week 30 Hrs   **Sub.Code: U1CMS41**
Credits: 2
OBJECTIVE:

To impart theoretical technical knowledge on MS Word, MS Excel, PowerPoint and MS Access

UNIT – 1   **(6-hours)**

Word 2007 - Starting Word 2007 – Creating documents – Saving a document – Existing word – Parts of Word window – Menus – Tool bars - Entering text – Selecting text – Deleting text – Copying, Cutting and Pasting – Finding and replacing text – Formatting a word document – Changing margins – Line spacing – Font size – Enhancing text – Alignment – Inserting numbers, Bullets, Page numbers, Header and Footer.

UNIT- 2   **(6-hours)**

Creating Tables – Inserting columns and rows – Deleting rows and columns – Deleting table - Entering and editing text in a table – Inserting pictures, Graphics and Word art.- Mail Merge – Using Mail Merge to print envelopes – Macros – Creating Macros – Recording Macros.

UNIT- 3   **(6-hours)**

Excel 2007 – Starting Excel 2007 - work books and worksheets – Entering data in worksheet – worksheet editing – cut, copy and paste in work sheet – Inserting and deleting rows

and columns – Changing width and height of rows and columns – Using formulas – Using auto fill - Relative and Absolute addressing – Functions in Excel – Data forms – Data Sort – Data filters in Excel – Pivot table - Creation of Charts in Excel – Saving workbook – exiting Excel.

UNIT- 4   **(6-hours)**

Power point 2007 – Creating a new presentation – Using blank presentation templates - Creating a new slide – Deleting a slide – Copying a slide – Slide numbering – Inserting pictures – Power point views – Slide transition – Slide animation – Saving a presentation – Closing a presentation.

UNIT- 5   **(6-hours)**

Access 2007 – Database basics – Starting Access 2007 – Creating a table – Entering table data: Datasheet view – Forms – Data filters: Filter by selection – Filter by Form – Queries: Types – Preparation of Reports – Saving a database – Exiting Access.

TEXT BOOK
1. MS Office 2000 for everyone – Sanjay Saxena

REFERENCE BOOKS
1. PC Software for windows made simple – R.K. Taxali
2. Teach yourself MS Office 2000 in 24 hours – Greg Perry

SECOND YEAR   IV – SEMESTER

MS OFFICE PRACTICAL

Hours: 2hrs/week 30 Hrs   **Sub.Code: U1CMS4P1**
Credits: 2

OBJECTIVE:

To provide practical knowledge on using Word, Excel, Power Point and Access in

business applications.

1. Create and print a Word document to prepare a Resume.
2. Create a table in a Word document.
3. Insert a Picture in a Word document.
4. Prepare and insert charts in a Word document.
5. Create a Word document using Mail Merge.
6. Create workers payroll using Excel.
7. Create a Pivot table using Excel.
8. Create, Save and Run macros in Excel.
9. Prepare an Excel sheet for sales analysis and draw a bar chart.
10. Design a Power point presentation to display an advertisement with audio effect.
11. Design a Power point presentation to introduce a course in your college.
12. Create a table (price list) using MS Access.
13. Create a report (price list) in MS Access.

Course Name: **Bachelor of Commerce**

Discipline: **Commerce** - **Computer Application**

COURSE SCHME:

Semester	Part	Subject	Hours	Credit	Int + Ext = Total	Subject Code	Revision
Third	III	Allied III – Business Statistics	6	5	25+75 = 100	U1CCA31	No Change
	III	Elective – I – Database Management Systems	6	5	25+75 = 100	U1CCE31	No Change
	III	Financial Accounting – III	6	4	25+75 = 100	U1CCC31	Revised
	III	Business Correspondence	5	4	25+75 = 100	U1CCC32	Revised
	III	Oracle Lab	5	3	40+60 = 100	U1CCC3P1	Revised
	IV	SBE – I – Multimedia Lab (Flash)	2	2	40+60 = 100	U1CCS3P1	Interchanged

Semester	Part	Subject	Hours	Credit	Int + Ext = Total	Subject Code	Revision
Fourth	III	Allied IV – Business Mathematics	6	5	25+75 = 100	U1CCA41	Revised
	III	Cost Accounting	5	4	25+75 = 100	U1CCC41	Revised
	III	Visual Programming	5	5	25+75 = 100	U1CCC42	Revised
	III	Visual Basic Lab	5	3	40+60 = 100	U1CCC4P1	Revised
	III	Financial Accounting – IV	5	4	25+75 = 100	U1CCC43	Revised

IV	SBE – II – MS-Office Theory	2	2	25+75 = 100	U1CCS41	New	
IV	SBE – III – MS-Office Practical	2	2	40+60 = 100	U1CCS4P1	Interchanged	

Year	Part	Subject	Hour	Credit	Code
I & II	Part V	NSS/ NCC/ Physical education – Sports	-	1	U1NS1/ U1NC1/ U1PS1

SECOND YEAR   III – SEMESTER
BUSINESS STATISTICS

Hours: 6hrs/week   90 Hrs   **Sub.Code:U1CCA31**
Credits: 5

OBJECTIVE:
 To provide basic skills on the usage of statistical tools to analyze business data.
UNIT – 1   **(18-hours)**
 Statistics: definition – functions – importance – limitations – methods of collection of data: primary – secondary – sampling: meaning – methods – classification and tabulation: meaning – types of classification – tabulation of data – difference between classification and tabulation – rules for tabulation - diagrammatic and graphic representation.
UNIT – 2   **(18-hours)**
 Arithmetic mean – geometric mean – harmonic mean – median – mode.
 Range – quartile deviation – mean deviation – standard deviation – co-efficient of variation (combined standard deviation excluded).
 Skewness – methods – Karl pearson's co-efficient of skewness – Bowley's co-efficient of skewness.
UNIT – 3   **(18-hours)**
 Correlation – Scatter diagram – Karl pearson's co-efficient of correlation – Rank correlation (concurrent deviation method excluded)
UNIT – 4   **(18-hours)**
 Regression analysis – regression equation – least square method – actual mean method.
 Index number – types – tests – consumer price index number.
UNIT – 5   **(18-hours)**
 Analysis of time series – components – methods of determining trend – graphic – semi average – moving average – least square.

TEXT BOOKS
 3. R.S.N. Pillai and V. Bagavathi – Statistics
 4. K. Alagar - Business statistics
REFERENCE BOOKS

3. S.P. Gupta- Business statistics
4. Sancheti kapoor - Statistics – theory , methods and application

Question paper should provide 80% credit to problems and 20% credit to theory.

SECOND YEAR   **III – SEMESTER**
DATABASE MANAGEMENT SYSTEMS

Hours: 6hrs/week 90 Hrs   **Sub.Code: U1CCE31**
Credits:5

OBJECTIVE:
       To provide theoretical knowledge on the use, structure and technology relating to data base management.

UNIT – 1   **(18-hours)**
       Data, Information and Information Processing –Definition of information – History of information – Quality of information – Information processing – Information and Enterprise – Integrated Management Information – Information as a competitive weapon.
       File Organization and File Structure – Introduction – Operations on files – File storage organization – Storage media – File structure – Record types.

UNIT – 2   **(18-hours)**
       Introduction to Database Management System (DBMS) – Characteristics of data in a database – Database Management System –Need for database management system – Types of database management systems – Hierarchical model – Network model – Relational model – Comparison.
       Entity – Relationship (E-R) Modeling – Components of an E-R model – E-R modeling symbols.

UNIT – 3   **(18-hours)**
       Data Normalization –First Normal Form – Second Normal Form – Third Normal Form – Boyce-Codd Normal form – Fourth Normal Form – Fifth Normal Form.

UNIT – 4   **(18-hours)**
       RDBMS Terminology – The Relational Data Integrity – Relational Data Manipulation – Codd's Rules – Tables, Views, Indexes – Nulls - Queries and Sub Queries - Aggregate functions – Joins and Unions.

UNIT – 5   **(18-hours)**
       PL/SQL Blocks – Architecture – Variables – data types – Control Structures – Cursors – Exceptions – Triggers – Types of Triggers – Procedures and Packages.

TEXT BOOKS

1. Alexis Leon & Mathews Leon – Database Management System – Leon Vikas Publishing, Chennai 2002.

REFERENCE BOOKS

1. Raghu Ramakrishnan / Johannes Gehrke – Database Management System – McGraw Hill, Third Edition, 2003.
2. Fred R. McFadden, Jeffrey A. Hoffer & Mary B. Prescott – "Modern Database Management", 5th Edition, Pearson Education Asia, 2001.

SECOND YEAR   III – SEMESTER
FINANCIAL ACCOUNTING - III

Hours: 6hrs/week 90 Hrs   **Sub.Code: U1CCC31**
Credits:4
OBJECTIVE:

To provide knowledge on accounting for Fire insurance claims, Royalty, Insolvency, Hire purchase and Investments.

UNIT – 1   **(18-hours)**

Fire insurance claims – loss of stock policy – consequential loss or loss of profit policy – application of average clause

UNIT – 2   **(18-hours)**

Royalty accounts – accounting treatment in the books of lessor and lessee – sub-lease

UNIT – 3   **(18-hours)**

Insolvency accounts – individual and firm – statement of affairs – deficiency account

UNIT – 4   **(18-hours)**

Sale or return basis – investment account – Voyage account.

UNIT – 5   **(18-hours)**

Hire purchase accounting – calculation of interest – cash price – accounting treatment in the books of hire purchaser and hire vendor – default and repossession – hire purchase – trading account – (debtors method only) Installment purchase system – accounting treatment in the books of buyer and seller

TEXT BOOKS
4. Financial accounting – S.Manikandan & R. Rakesh Shankar
5. Advanced accountancy – T.S.Reddy and A.Murthy
6. Advanced accounting – R.S.N.Pillai & Bagavathy

REFERENCE BOOKS
7. Advanced accountancy – R.L.Gupta & Radhaswamy
8. Advanced accounts – S.P.Jain & K.L.Narang
9. Advanced accountancy – M.A.Arulanandam & K.S.Raman
10. Advanced accountancy – S.N.Maheswari & S.K.Maheswari
11. Advanced accountancy – P.C.Tulsian
12. Advanced accounts – M.C.Shukla and T.S.Grewal

Note: the questions should be asked in the ratio of 80% for problems and 20% for theory.

SECOND YEAR   III – SEMESTER
BUSINESS CORRESPONDENCE

Hours: 5hrs/week 75 Hrs   **Sub.Code: U1CCC32**
Credits:4
OBJECTIVE:

To provide skills in writing business letters reports in English.

Unit – 1:   **(15-hours)**

Nature and Importance Business Correspondence – Qualities of a good business letter – Types of business letter – Structure and Layout

Unit - 2:   **(15-hours)**

Mission statement – career objectives - Job application Letter and Resume –order of appointment - Letter of Acceptance – Relieving order - Letter of resignation

Unit - 3:   **(15-hours)**

Requests for quotations, Offer letters – Purchase order – Complaints and Adjustment letters- Collection letters.

Drafting of sales letters, circular letters preparations of market survey reports.

Unit - 4:   **(15-hours)**

Bank Correspondence - Insurance Correspondence - Agency Correspondence - Correspondence with Shareholders, Directors.

Unit - 5:   **(15-hours)**

Messages through electronic media – SMS – email- Representations to Government, Trade associations, and Public authorities

TEXT BOOKS

3. Essentials of Business Communication - Rajendra Pal and J. S. Korlhalli - Sultan Chand & Sons, New Delhi.
4. Business Correspondence – R.S.N. Pillai & Bagavathi

REFERENCE BOOKS

8. Business Correspondence and Report Writing - R. C. Sharma, Krishna Mohan - Tata McGraw-Hill Publishing Company Limited, New Delhi.
9. Business Communication (Principles, Methods and Techniques) Nirmal Singh - Deep & Deep Publications Pvt. Ltd., New Delhi.
10. Business Communication - M. Balasubrahmanyan - Vani Educational Books.
11. Business Communication - K. K. Sinha - Galgotia Publishing Company, New Delhi.
12. Business Communication - Dr. S.V. Kadvekar, Prin. Dr. C. N. Rawal and Prof. Ravindra Kothavade - Diamond Publications, Pune.
13. Modern Business Correspondence - L. Gartside - The English Language Book Society and Macdonald and Evans Ltd.
14. Creating a Successful CV - Siman Howard - Dorling Kindersley.

SECOND YEAR   III – SEMESTER

ORACLE LAB

Hours: 5hrs/week 75 Hrs   **Sub. Code: U1CCC3P1**
Credits:3
OBJECTIVE:

To provide practical knowledge to the students on creating and modifying database using Oracle.

1. Create a table "Student Mark List" having the following fields.
   Name, Reg_no, Mark1, Mark2, Mark3, Total, Average, Result.

    1) Insert minimum 10 records.
    2) Query to find the total, average and result.

2. Create a table "Electricity Bill" having the following fields.
Customer Name, Customer Number, Previous meter reading, Current meter reading, Units consumed, Type, Amount.
    1) Insert minimum 10 records.
    2) Query to find the units consumed.
    3) Query to find the amount where Type = 'House' Rs.5 per unit
                                 Type = 'Office' Rs.8 per unit
                                 Type = 'Factory' Rs.12 per unit.

3. Create a table "Simple Interest" having the following fields.
Principal amount, No. of Years, Rate of Interest, Interest amount.
    1) Insert minimum 10 records.
    2) Query to find the interest amount.

4. Create a table "Compound Interest" using sequence with the following fields.
Principal amount, No. of Years, Rate of Interest, Interest amount.
    1) Insert minimum 10 records.
    2) Principal amount varies from 5000 to 10000 in steps of 500
    3) Rate_of_interest = 12% & No. of Years = 5
    4) Calculate the compound interest

5. Create a table 'Personal Details" having the following fields.
Name, Age, Sex, Qualification, Designation, Date_of_Birth, Basic_Pay.
    1) Insert minimum 10 records.
    2) Query to select the records having names starting with the letter S.
    3) Sort the table in the ascending order of names.
    4) Display the records where the qualification is MCA.
    5) Display the records where the basic_pay between 15000 and 25000.

6. Create a table "Course Details" having the following fields.
Student name, Course name, Duration, Date_of_Joining, Course fees, Institute.
    1) Insert minimum 10 records.
    2) Convert the first letter of the student name in capital.
    3) Count the number of students studied in each institute.
    4) Display the last date of the month in Date_of_Joining filed.
    5) Display the Course name of duration two months.
    6) Display the first two characters from course name where the institute is Aptech.
    7) Display the course name where the course fee is greater than 5000 excluding duplication.
    8) Display only the three characters from the fourth character in the institute filed.

7. Create a table "Employee Details" having the following fields.
Employee number, Employee name, Department id, Basic pay, HRA, Deductions, Tax.

1) Insert minimum 5 records.
2) Get the number of employees in the department 'D1'.
3) Find the total pay for all the employees in the department 'D1'.
4) Find the department-wise average pay of the employees.
5) Find the name of the employee who gets the maximum basic pay.

8. PL/SQL program to calculate Depreciation using Straight Line and Written Down Value methods.
9. PL/SQL for No data found and Zero divide exception.
10. PL/SQL program using triggers.
11. PL/SQL program to find the factorial of a given number.
12. PL/SQL program to generate Fibonacci series.
13. PL/SQL program to check whether the given number is Prime or not.
14. PL/SQL program to fetch data using cursors.
15. PL/SQL program to insert records into the item table.

SECOND YEAR   III – SEMESTER
MULTI MEDIA LAB (FLASH)

Hours: 2hrs/week 30 Hrs   **Sub. Code: U1CCS3P1**
Credits:2

OBJECTIVE:
         To provide hands on training to the students on multimedia software.

Motion Tween
1. Flash movie for motion along a path using text.
2. Flash movie for motion along a path using Car.
3. Flash movie for photo masking.
4. Flash movie for deer running animation using movie clip.
5. Flash movie for developing a gif file.

Tweening Shapes
6. Flash movie for transforming shapes, Text morphing, changing text to object, and changing object to text, jumbled text animation.
7. Flash movie for number count animation.

Action script 2.0
8. Designing an arithmetic calculator using Flash.
9. Flash movie for bouncing ball animation using play and pause buttons.
10. Flash movie for number count animation using action script.
11. Flash movie for moving a ball using arrow keys.
12. Flash movie for applying various text effects.

SECOND YEAR   IV – SEMESTER
BUSINESS MATHEMATICS

Hours: 6hrs/week   90 Hrs   **Sub.Code: U1CCA41**
Credits:5

OBJECTIVE:

To provide computational skills on sets, indices, differential calculus, integral calculus and matrices and to apply them in solving business problems.

UNIT – 1 (18-hours)

Theory of sets: Definition – Finite and infinite sets – description of sets – singleton set – null set – subset – equality of sets – disjoint sets – Set operations: Union of sets – intersection of sets – difference of sets – complement of a set – venn diagram – law of sets: cumulative law - associate law – distributive law – demorgan's laws (properties excluded) – number of elements in a set

UNIT – 2 (18-hours)

Indices: laws of indices (proof excluded) – negative index – zero and unity index – fractional index –Simple interest – compound interest calculations.

UNIT – 3 (18-hours)

Differential calculus: differentiation – derivative of x^n, e^x, $\log e^x$, sin x, cos x, tan x, cot x, sec x, cosec x, a constant, ku, where k is a constant and u is a function (formulae only) – derivative of sum of two functions – product rule – quotient rule (formula only) – maxima and minima: definition – criteria for maxima and minima – working rule.

UNIT – 4 (18-hours)

Integral calculus – standard results – integrals of function containing linear function of x (formula only) – (standard results of sin x, cos x, etc excluded) – integration by substitution.

UNIT – 5 (18-hours)

Matrices: Definition – order – types (Skew symmetric excluded) – operations on matrix: addition, subtraction – product of two matrices.

Determinant of a matrix: definition – expansion of a determinant – (minors and cofactors – singular – non-singular – properties of determinants excluded) – inverse of matrix – simultaneous linear equations.

TEXT BOOKS
3. Dr. M.Manoharan, Dr. C.Elango, Prof. K.L.Eswaran - Business Mathematics
4. Sancheti and Kapoor - Business mathematics

REFERENCE BOOKS
7. V.Sundaresan & Jeya seelon - Business mathematics
8. P.R.Vittal - Business mathematics
9. R.S. Soni - Essential business mathematics & business statistics
10. A.P. Verma - Business mathematics
11. N.G. Das - Business mathematics and statistics
12. N.K.Nag - Business mathematics

Question paper should provide 80% credit to problems and 20% credit to theory.

SECOND YEAR   IV – SEMESTER
COST ACCOUNTING
Hours: 5hrs/week 75 Hrs   **Sub. Code: U1CCC41**
Credits:4

OBJECTIVES
- To acquaint the student with basic concepts used in cost accounting and various methods involved in cost ascertainment.
- To provide knowledge on the use of costing data for planning, control and decision-making

UNIT – 1 (15-hours)

Introduction: Meaning, Objectives and advantages of cost accounting, difference between cost accounting and financial accounting. Cost concepts and Classification, cost unit, cost centre, cost object – Cost sheet.

UNIT – 2 (15-hours)

Accounting and Control of material cost: Issue of materials – Bin card - Methods of Pricing of material issues-FIFO, LIFO, Weighted Average, Inventory Control- Concept and techniques like fixing of stock levels, EOQ, ABC analysis- Material losses and their treatment.

UNIT – 3 (15-hours)

Labour: Time Rate and Piece Rate System – Incentive plans: Halsey, Rowan, Taylor and Merrick plans – Labour Turnover: Causes and methods.

UNIT – 4 (15-hours)

Overheads: Classification, allocation, apportionment and absorption of over head. Treatment of over and under absorption. Reconciliation of cost and Financial Accounts.

UNIT – 5 (15-hours)

Methods of costing - Contract Costing- Process Costing – Abnormal Loss – Abnormal Gain - Process Accounts – Cost Audit : Meaning, importance.

TEXT BOOKS
3. RSN Pillai & Bagavathi - Cost accounting.
4. R. Murthy & S. Gurusamy - Cost accounting.

REFERENCE BOOKS
6. S.P. Jain and K.L. Narang, Cost Accounting, Principles and Methods, Kalyani Publishers, Jalandhar
7. S.P.Iyengar - Cost accounting principles & practice
8. B.M. Lall Nigam & I.C. Jain - Cost accounting on introduction
9. M.N. Arora - Cost accounting principles and practice
10. P.C.Tulsian - Cost accounting

Question paper should provide 60% credit to problems and 40% credit to theory.

SECOND YEAR **IV – SEMESTER**

VISUAL PROGRAMMING

Hours: 5hrs/week 75 Hrs **Sub. Code: U1CCC42**
Credits:5
OBJECTIVE:

To provide theoretical and programming knowledge in visual basic languages.

UNIT – 1 (15-hours)

Introduction – Starting & Exiting Visual Basic – Using Project Explorer – Working with Forms – Using Toolbox – Working with Projects – Printing Projects – Building & Running Applications.

Adding code & Using Events – Using Code Window – Using Naming Conventions – Using Variable – Scope – Subroutines & Functions.

UNIT – 2 **(15-hours)**

Using intrinsic visual basic controls – Label & Textbox Controls – Using Command Button Control – Using Frame, Checkbox, Option Button Controls – List Box and Combo Box , Picture Box, Rich Text Box Controls – Formatting Controls – Using Control Arrays – Using Tab Order.

Working with strings – Using Strings, Converting Strings, Concatenating Strings, Formatting Strings, Manipulating Strings, Comparing Strings.

UNIT – 3 **(15-hours)**

Working with numbers – Using Numeric Values – Using Numeric Operators – Math Functions – Random Numbers

Using control statements – If & IIF – Select Case – Do – For – For each - Exit Statements.

UNIT – 4 **(15-hours)**

Using dialogue boxes – MsgBox – Input Box – Common Dialogue Control – Open & Save as Dialog Boxes – Color Dialog Box – Font Dialog Box – Print Dialog Box –

Creating Menus – Adding Code to Menu – Creating Shortcut Menu – Creating tool bar – Adding code to tool bar.

UNIT – 5 **(15-hours)**

Using Files and Databases – Opening, Closing and Deleting Files and Reading and Working with Files – Grid control

TEXT BOOKS
1. Scott Warner – Teach Yourself VB6 – Tata Mc Hill, New Delhi, 1999
2. Gary Cornell – Visual Basic 6 from the Ground up – TMH, New Delhi, 1999

REFERENCE BOOK
1. Mastering Visual Basic 6 – Evangel Pertoutsos – BPB Publishers.

SECOND YEAR **IV – SEMESTER**

VISUAL BASIC – LAB

Hours: 5hrs/week 75 Hrs **Sub. Code: U1CCC4P1**
Credits:3

OBJECTIVE:

To provide hands on training to students on the application of visual programming techniques.

Simple Applications
1) Performing Arithmetic Operations
2) Working with Shape and Button Controls
3) Designing a Color Mixer
4) Preparing Student Mark List

5) Designing a Simple Font Dialog Box
6) Working with List Box Control
7) Performing String Functions

Graphics Applications

8) Displaying the System Time and Drawing a Circle in the Form
9) Drawing Circles at the Time of Click and Drag.
10) Using Free Hand Drawing
11) Using Image Viewer

Animation Applications

12) Designing Screen Saver
13) Designing a Traffic Signal
14) Creating Butterfly Animation

Multimedia Applications

15) Playing Audio and Video files (MP3,WAV, AVI)

Menus and Tool Bars

16) Creating Menu with Simple File, Edit and Format Options
17) Designing a Simple Tool Bar

Files and Databases

18) Creating Files and Folders Without Using FSO
19) Creating Phone Book Using DAO
20) Creating Student Details Using ADO

SECOND YEAR   IV – SEMESTER
FINANCIAL ACCOUNTING – IV

Hours: 5hrs/week 75 Hrs   **Sub. Code: U1CCC43**
Credits:4

OBJECTIVE:
To provide comprehensive knowledge on accounting for partnership firms.

UNIT – 1   **(15-hours)**

Partnership accounts – partnership – definition – Partnership Deed – Registered firm and unregistered firm implication - provisions relating to partnership accounting – capital and current accounts of partners – fixed and fluctuation – appropriation of profits – past adjustments and guarantee – final accounts of firms

UNIT – 2   **(15-hours)**

Admission of new partners – calculation of new profit sharing ratio and sacrificing ratio – adjustment of undistributed profits, losses and reserves – revaluation of assets and liabilities – treatment of goodwill (As per AS – 10) – adjustment of capitals of partners after admission of a partner.

UNIT – 3   **(15-hours)**

Retirement of partners – transfer of balance due to retired partner – gaining ratio - purchase of retired partner's share by the remaining partners – death of a partner – treatment of joint life policy – settlement of amount due to legal representatives of deceased partner

UNIT – 4   **(15-hours)**

Dissolution of partnership – accounting treatment – insolvency of a partner – decision in Garner Vs Murray case – insolvency of all partners – piecemeal distribution – proportionate capital method – maximum loss method

UNIT – 5   **(15-hours)**
Amalgamation of firms and Sale to a company

TEXT BOOKS
1. Financial accounting – S.Manikandan & R. Rakesh Shankar
2. Advanced accountancy – T.S.Reddy and A.Murthy
3. Advanced accounting – R.S.N.Pillai & Bagavathy

REFERENCE BOOKS
1. Advanced accountancy – R.L.Gupta & Radhaswamy
2. Advanced accounts – S.P.Jain & K.L.Narang
3. Advanced accountancy – M.A.Arulanandam & K.S.Raman
4. Advanced accountancy – S.N.Maheswari & S.K.Maheswari
5. Advanced accountancy – P.C.Tulsian
6. Advanced accounts – M.C.Shukla and T.S.Grewal

Question paper should provide 80% credit to problems and 20% credit to theory.

SECOND YEAR   **IV – SEMESTER**
MS-OFFICE THEORY
Hours: 2hrs/week 30 Hrs   **Sub. Code: U1CCS41**
Credits:2
OBJECTIVE:
        To impart theoretical technical knowledge on MS Word, MS Excel, PowerPoint and MS Access

UNIT – 1   **(6-hours)**
        Word 2007 - Starting Word 2007 – Creating documents – Saving a document – Existing word – Parts of Word window – Menus – Tool bars - Entering text – Selecting text – Deleting text – Copying, Cutting and Pasting – Finding and replacing text – Formatting a word document – Changing margins – Line spacing – Font size – Enhancing text – Alignment – Inserting numbers, Bullets, Page numbers, Header and Footer.

UNIT- 2   **(6-hours)**
        Creating Tables – Inserting columns and rows – Deleting rows and columns – Deleting table - Entering and editing text in a table – Inserting pictures, Graphics and Word art.- Mail Merge – Using Mail Merge to print envelopes – Macros – Creating Macros – Recording Macros.

UNIT- 3   **(6-hours)**
        Excel 2007 – Starting Excel 2007 - work books and worksheets – Entering data in worksheet – worksheet editing – cut, copy and paste in work sheet – Inserting and deleting rows and columns – Changing width and height of rows and columns – Using formulas – Using auto fill - Relative and Absolute addressing – Functions in Excel – Data forms – Data Sort – Data filters in Excel – Pivot table - Creation of Charts in Excel – Saving workbook – exiting Excel.

UNIT- 4   **(6-hours)**
        Power point 2007 – Creating a new presentation – Using blank presentation templates - Creating a new slide – Deleting a slide – Copying a slide – Slide numbering – Inserting pictures

– Power point views – Slide transition – Slide animation – Saving a presentation – Closing a presentation.

UNIT- 5 (6-hours)

Access 2007 – Database basics – Starting Access 2007 – Creating a table – Entering table data: Datasheet view – Forms – Data filters: Filter by selection – Filter by Form – Queries: Types – Preparation of Reports – Saving a database – Exiting Access.

TEXT BOOK

3. MS Office 2000 for everyone – Sanjay Saxena

REFERENCE BOOKS

1. PC Software for windows made simple – R.K. Taxali
4. Teach yourself MS Office 2000 in 24 hours – Greg Perry

SECOND YEAR   IV – SEMESTER

MS OFFICE PRACTICAL

Hours: 2hrs/week 30 Hrs **Sub. Code: U1CCS4P1**
Credits:2

OBJECTIVE:

To provide practical knowledge on using Word, Excel, Power Point and Access in business applications.

14. Create and print a Word document to prepare a Resume.

15. Create a table in a Word document.

16. Insert a Picture in a Word document.

17. Prepare and insert charts in a Word document.

18. Create a Word document using Mail Merge.

19. Create workers payroll using Excel.

20. Create a Pivot table using Excel.

21. Create, Save and Run macros in Excel.

22. Prepare an Excel sheet for sales analysis and draw a bar chart.

23. Design a Power point presentation to display an advertisement with audio effect.

24. Design a Power point presentation to introduce a course in your college.

25. Create a table (price list) using MS Access.

26. Create a report (price list) in MS Access.

Course Name: **Master of Commerce**

Discipline: **Commerce**

COURSE SCHME:

Semester	Subject	Hours	Credit	Int + Ext = Total	Subject Code	Revision
Third	Direct Taxes – I	6	5	25+75 = 100	P1CMC31	Revised
	Retail Management	6	4	25+75 = 100	P1CMC32	Revised
	Indirect Tax – I	6	4	25+75 = 100	P1CMC33	Revised
	Strategic Management	6	4	25+75 = 100	P1CMC34	New
	Elective – II – Corporate Accounting	6	5	25+75 = 100	P1CME31	Revised

Semester	Subject	Hours	Credit	Int + Ext = Total	Subject Code	Revision
Fourth	Financial Management	6	5	25+75 = 100	P1CMC41	Revised
	Direct Taxes – II	6	4	25+75 = 100	P1CMC42	Revised
	Entrepreneurship Development	6	4	25+75 = 100	P1CMC43	Revised
	Indirect Tax – II	6	4	25+75 = 100	P1CMC44	Revised
	Elective – III – Accounting Standards & Corporate Reporting	6	5	25+75 = 100	P1CME41	New

SECOND YEAR   **III – SEMESTER**
DIRECT TAXES - I
Hours: 6hrs/week 90 Hrs   **Sub.Code: P1CMC31**
Credits:5

OBJECTIVE:
        To provide basic knowledge on the provisions of the Income tax law and to provide skills on the computation of the taxable income.
Unit – 1   **(18-hours)**
        Income Tax Act 1961 – Definitions- Income, deemed income, person, and assessee – Basis of charge – Residential status – capital and Revenue Receipts – Exempted income.

Unit – 2 (18-hours)

Computation of Income from Salary – meaning- salary, profit in lieu of salary-Allowances- fully taxable, fully exempted and special– Perquisites- exempted perquisites, valuation of car, accommodation, medical facility, leave travel concession, transfer of moveable assets. Computation of Income from House property – complete coverage

Unit – 3 **(18-hours)**

Profits and Gains of Business or Profession – Depreciation – Admissible deductions sec 30 to 37- Inadmissible expenses Sec 40(a), 40 (b), 40A

Unit – 4 **(18-hours)**

Computation of Capital Gains and Income from Other sources- Capital asset, transfer-Indexation – Exemptions – 54 to 54GA

Unit – 5 **(18-hours)**

Aggregation of income - set-off and carry forward losses – deductions from Gross Total Income (60% problems and 40% theory)

TEXT BOOKS
1. Direct taxes law and practice – Vinod K.Singhania.
2. Income tax law and practice – Mehrotra and Goyal.

REFERENCE BOOKS
1. Income tax law and practice – Bhagwati Prasad.
2. Direct taxes practice and planning – B.B.Lal
3. Income tax law and practice – Sukumar Bhattacharya

SECOND YEAR   III – SEMESTER
RETAIL MANAGEMENT

Hours: 6hrs/week 90 Hrs   **Sub.Code: P1CMC32**
Credits: 4

OBJECTIVES:

To provide the student with knowledge on the basic concepts, principles and management of retail business.

Unit – 1 **(18-hours)**

Retail Management: Introduction, meaning, characteristics, functions – Retail formats. Retail Industry in India - role of retailing - trends in retailing- the changing face of retailing – FDI in Retailing.

Unit - 2 **(18-hours)**

Consumer behaviour – Decision process – Factors affecting consumers behaviour - Retail Market Segmentation – Importance - Criteria for effective segmentation - Dimensions of Segmentation - customer profiles.

Unit – 3 **(18-hours)**

Importance of location decisions- location determining factors- types of retail location- site selection analysis- estimate of store sales- retail location theories –location assessment procedures.

Unit - 4 **(18-hours)**

Products and merchandise management, product movement, merchandising plans, structure, and nature of retailing channels - criteria for selection of supplier's channel - store management.

Unit – 5 (18-hours)

Retail pricing decision: Determining Pricing Objectives – Approaches for setting price –Cost oriented pricing Competition oriented pricing – Pricing strategies for retailers – Factors affecting retail price strategy.

Retail store brand management: Role of brand in retailing – Branding options for retailers – Private Label brands: In-stores' Brands – Branding strategies in retail.

TEXT BOOK

1. Retail Management- Chetan Bajaj, Rajnish Tuli, Nidhi. V.Srivastava, 2005

REFERENCE BOOKS

1. Retail Management-Swapna Pradhan
2. Integrated Retail Management –James R.ogden & Denise T.
3. Retail Management – Levy & Weitz –TMH 5th Edition 2002.
4. Retail Management – Chetan Bajaj.
5. Retail Management – A strategic Approach, Macmillan publishing co.inc. New York.

SECOND YEAR   **III – SEMESTER**

INDIRECT TAXES- I

Hours: 6hrs/week   90 Hrs   **Sub.Code: P1CMC33**
Credits:4

OBJECTIVE:

        To provide basic knowledge on the various indirect tax laws including central excise, customs and GST.

Unit – 1 (18-hours)

        Tax- History- direct taxes and indirect taxes- Canons of taxation – Essentials of an effective tax system. Tax administration – Central and state taxes- Allocation of tax revenue between central and state governments. The concept of GST.

Unit – 2 (18-hours)

        Central Excise Act 1944: Definitions – Nature and Scope of Levy of duties of Central Excise – Classification and valuation of excisable goods – procedure for Registration -clearance of excisable goods – procedure under physical control – self removal procedure – personal ledger accounts

Unit – 3 (18-hours)

        Cenvat Credit - assessments – exemption from duty appeals and revision – power of central excise officers – penalties and punishments

Unit – 4 (18-hours)

        Customs Act 1962: Scope of Customs Law- Taxable event- Imports and Exports procedure – types of customs duties – valuation of goods- and clearance of imported goods – warehousing

Unit – 5 (18-hours)

        Exemptions– baggage rules – SEZ and EOU- Drawback of customs duties – powers of customs officers – appeals – penalties and offence

TEXT BOOKS

1. Indirect taxes – V.S.Datey, Taxmann Publications Pvt Ltd., New Delhi.
2. Indirect taxes – V.Balachanadran – Sultan Chand & Sons, New Delhi

3. Indirect Taxes – Dr. H.C.Mehrotra & S.P. Goyal, Sathitya Bhawan publication, Agra.

REFERENCE BOOKS
1. Service Tax – S.S.Gupta, Taxmann Publication Pvt Ltd., New Delhi.
2. The law of central sales tax – S.D.Singh
3. Central Excise Law Guide – R.K.Jain

SECOND YEAR   **III – SEMESTER**

STRATEGIC MANAGEMENT

Hours: 6hrs/week 90 Hrs   **Sub.Code: P1CMC34**
Credits:4

OBJECTIVE

To provide a higher level of knowledge on an important functional areas of management and to prepare the students for the top level management.

Unit -1   **(18-hours)**

Introduction to strategic management – Definition of strategic management – Elements in strategic management process – Model of strategic management process – Strategic intent – Vision – Mission – Business model – Strategic Alliance and tie ups - Goals and objectives.

Unit – 2   **(18-hours)**

Strategy formulation – Environmental appraisal – Concept of environment – environmental sectors – Environmental scanning – Appraising the environment – Organisational appraisal – Dynamics of internal environment – Organisational capability factors – Considerations in organizational appraisal – Methods and techniques used for organizational appraisal – Structuring organizational appraisal.

Unit – 3   **(18-hours)**

Corporate level strategies: Expansion, Stability, Retrenchment, Combination, Concentration, Integration, Diversification, Internationalization, Cooperation strategies. Business level strategies: Generic Business Strategies.

Unit – 4   **(18-hours)**

Strategy implementation – Activating strategies – Structural implementation – Behavioural implementation – Functional and operational implementation.

Unit – 5   **(18-hours)**

Strategic evaluation and control – An overview of strategic evaluation and control – Strategic control – Operational control – Techniques of strategic evaluation and control – Role of organizational system in evaluation.

TEXT BOOKS
1. Strategic Management and Business Policy - Azhar Kazmi - Tata McGraw Hill
2. Business Policy and Strategic management - William F. Glueck - Tata McGraw Hill

REFERENCE BOOKS
1. Strategic Management - Richard B. Robinson Jr. John - Prentice Hall of India
2. Business Environment and Policy – Fanks - Himalaya Publishers
3. Business Policy and Planning - Jimmy Davar Raj K. Wadwa – Kanishka
4. Ethical Choices in Business - P. Baskar Rao - Kanishka

SECOND YEAR   **III – SEMESTER**
CORPORATE ACCOUNTING
Hours: 6hrs/week 90 Hrs   **Sub.Code: P1CME31**
Credits:5

OBJECTIVE:
　　　　To provide practical knowledge on the finanical accounting for corporates including Banking, Insurance and Electricity companies.

Unit – 1   **(18-hours)**
　　　　Preparation of Final accounts of companies – Calculationg of Profits prior to incorporation - Valuation of Goodwill and Shares.

Unit – 2   **(18-hours)**
　　　　Accounting for Amalgamation, Absorption, Reconstruction of companies, Alteration of Capital and Liquidation of companies.

Unit – 3   **(18-hours)**
　　　　Accounting for Banking and Insurance companies – final accounts and schedules – Accounting for Electricity companies including Double Accounts.

Unit – 4   **(18-hours)**
　　　　Accounting for Holding companies – legal provisions – preparation of consolidated profit and loss account and balance sheet.

Unit – 5   **(18-hours)**
　　　　Accounting for price level changes with special reference to General Purchasing Power and Current Cost Accounting – Human Resource Accounting.

TEXT BOOKS
  13. Advanced accountancy – T.S.Reddy and A.Murthy
  14. Advanced accountancy – S.N.Maheswari & S.K.Maheswari
  15. Advanced accountancy – M.A.Arulanandam & K.S.Raman

REFERENCE BOOKS
  1. Advanced accountancy – R.L.Gupta & Radhaswamy
  2   Advanced accounts – S.P.Jain & K.L.Narang
  3. Advanced accountancy – P.C.Tulsian
  4. Advanced accounts – M.C.Shukla and T.S.Grewal

Question paper should provide 80% credit to problems and 20% credit to theory.

SECOND YEAR   **IV – SEMESTER**
FINANCIAL MANAGEMENT
Hours: 6/week   90 Hrs   **Sub. Code: P1CMC41**
Credits: 5

Objectives
　　　　To provide skills and knowledge to the students on the various financial management functions such as capital budgeting, working capital management, capital structure decisions and dividend policy decision making.

Unit -1   (18-hours)

Financial Management – Meaning, Definition Scope and Objectives – Profit maximisation Vs Wealth maximisation - Functions of Financial Management – Organisation of Finance Section – Role of Finance Manager.

Unit -2   (18-hours)

Capital Budgeting – Principles and Techniques – Payback method - ARR – Discounted Cash Flow Method (DCF) – Present Value (PV) / Net Present Value (NPV) Method – Internal Rate of Return (IRR) Method – Profitability Index – Terminal Value Method.

Unit-3   (18-hours)

Working Capital Management – Permanent and Temporary Working Capital – Changes in Working Capital – Determinants of Working Capital – Computation of Working Capital requirements – Sources of Working Capital.

Unit -4   (18-hours)

Cost of Capital – Definition – Importance – Assumptions – Explicit and Implicit Costs – measurement of Specific Cost – Cost of Equity – Cost of Debt – Cost of Retained Earnings – Cost of Preference Shares – Computation of Overall Cost of Capital.

Capital Gearing – Financial Leverage and Operating Leverage – Computation of leverages and value of firm.

Unit-5   (18-hours)

Dividend and Dividend Policy – Meaning, Classification and Sources of Dividend – Factors influencing Dividend Policy – Theories of Dividend decisions – Irrelevance and Relevance Theories. Capital Structure – Factors Influencing Financing Decisions – Methods of Financing – Theories of Capital Structure –.

TEXT BOOKS

   1.Financial Management : S.N. Maheshwari

   2.Financial Management Theory and Practice – Shashi K.Gupta & R.K.Gupta

REFERENCE BOOKS

   1.Financial Management : Prasana Chandra, Tata Mcraw Hill

   2.Financial Management : Khan and Jain

   3.Financial Management : I.M.Pandy

Question paper should provide 60% credit to problems and 40% credit to theory.

SECOND YEAR   **IV – SEMESTER**
DIRECT TAXES - II

Hours: 6/week   90 Hrs   **Sub. Code: P1CMC42**
Credits: 4

OBJECTIVE:

To provide skills on the computation of taxable income and tax liability of individuals, firms and companies, and to provide basic knowledge on TDS & TCS and Wealth Tax provisions.

Unit – 1   (18-hours)

Assessment of Individual – Deductions under Chapter VIA- tax rates – computation of total income and tax liability– Hindu Undivided Family- meaning, Dayabagha and Mitakshara schools- computation of total income and tax liability

Unit – 2 **(18-hours)**

Assessment of Firm and AOP- Conditions for assessment as such - Remuneration to partners and interest on capital- assessment of partners' individual income- Assessment of AOP – features- Difference between assessment of firm and AOP

Unit – 3 **(18-hours)**

Assessment of Companies –Company, Indian Company, Widely held company- Assessment- MAT

Unit – 4 **(18-hours)**

TDS and TCS and Advance Payment of Tax- Assessment – different types – Return of income -Due dates- Appeals and Penalties

Unit – 5 **(18-hours)**

Wealth Tax Act 1957 – Definitions – Scope – Net wealth – Assets – Deemed Assets – Valuation of Assets – Exempted Assets.

TEXT BOOKS
1. Direct taxes law and practice – Vinod K.Singhania.
2. Income tax law and practice – Mehrotra and Goyal.

REFERENCE BOOKS
1. Income tax law and practice – Bhagwati Prasad.
2. Direct taxes practice and planning – B.B.Lal
3. Income tax law and practice – Sukumar Bhattacharya

Question paper should provide 60% credit to problems and 40% credit to theory.

SECOND YEAR **IV – SEMESTER**
ENTREPRENEURSHIP DEVELOPMENT
Hours: 6/week **90 Hrs** **Sub. Code: P1CMC43**
Credits: 4

OBJECTIVE:

To provide entrepreneurial skills to the students and also to know about the woman entrepreneurs.

Unit – 1 **(18-hours)**

Entrepreneurship: meaning, definition and importance – role of entrepreneurship in the process of economic development – entrepreneur vs manager. Factors affecting entrepreneurship growth: economic, social, cultural, personality, psychological and sociological factors. Maslow's Need Hierarchy Theory, Herberg's Theory, Mc Clelland's achievement motivation theory – motivational factors of entrepreneurship.

Unit – 2 **(18-hours)**

Entrepreneurship Competencies: competence – Meaning, components: knowledge, skill, traits and motives – Qualities of entrepreneurs – types of entrepreneurs – functions of entrepreneurs – entrepreneurship culture

Unit – 3   **(18-hours)**

Enterprise building: (Starting of a new enterprise) agencies that help beginners in enterprise building – steps in enterprise building: finding out new business idea – identifying a suitable business opportunity – preliminary evaluation – project formulation – preparation of project report – project appraisal – financial analysis – profitability analysis – social cost benefit analysis – implementation of enterprise building

Unit – 4   **(18-hours)**

Entrepreneurship development institutions in India: NAYE, SIPCOT, TIDCO, SISI, DIC – SSI Registration. Government Assistance: Concession and subsidies.

Unit – 5   **(18-hours)**

Women Entrepreneurs: Concept of women entrepreneurship – functions and role of women entrepreneurs – growth of women entrepreneurship in India – recent trends in development of women entrepreneurs

TEXT BOOKS
1. C.B. Gupta - Entrepreneurship development
2. S.S. Khanka - Entrepreneurial development.
3. E.Gorden & Nadarajan – Entreprenurship Development

REFERENCE BOOKS
1. Vasanth Desai – Entrepreneurship Development - Himalaya Publication, New Delhi.
2. Desh Pande M.U. – Entrepreneurship of small scale industries concept, growth management , Deep and Deep Publications
3. Jose paul N. Ajith Kumar – Entrepreneurship development Himalaya pub., New Delhi

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SECOND YEAR   IV – SEMESTER
INDIRECT TAX- II

Hours: 6/week   90 Hrs   Sub. Code: P1CMC44
Credits: 4
OBJECTIVE:

To provide knowledge on various Indirect Tax laws such as, CST, Service Tax, VAT etc.

Unit – 1   **(18-hours)**

Central Sales Tax Act 1956: Definitions – Scope of Levy of Tax under the Act- declared goods – Inter State Sales – Sales or Purchases in the course of import and export – Levy and collection of tax and penalties – procedure for registration – exemptions from CST – Recovery and refund – Restriction on Levy of tax on declared goods – appeals – offences.

Unit – 2   **(18-hours)**

Service Tax – Definition – Nature and Scope – Taxable Services – negative list - Procedure for Registration – Assessment – Returns- Forms- Payment of Service tax- Appeals – offence and penalties

Unit – 3   **(18-hours)**

Valuation of Taxable services- Chartered Accountant's service- Mandap keeper's service – Commercial training or coaching service- Information technology software service – Business Exhibition service- Scientific and technical consultancy service- Technical testing and analysis service- Business auxiliary services – Business support services- Internet Café-

Unit – 4 (18-hours)

VAT – Introduction – Meaning – Definition – Features – Importance – Merits and Limitations –Variants of VAT- Methods of VAT – Administrative procedures followed by States.

Unit – 5 (18-hours)

Levy of VAT – input tax credit – input tax credit on capital goods – TIN- VAT rates and classification of Commodities – self assessment and returns- records and stock transfer. – Features of TN VAT.

TEXT BOOKS

1. Indirect taxes – V.S.Datey, Taxmann Publications Pvt Ltd., New Delhi.
2. Indirect taxes – V.Balachanadran – Sultan Chand & Sons, New Delhi
3. Indirect Taxes – Dr. H.C.Mehrotra & S.P. Goyal, Sathitya Bhawan publication, Agra.

REFERENCE BOOKS

1. Service Tax – S.S.Gupta, Taxmann Publication Pvt Ltd., New Delhi.
2. The law of central sales tax – S.D.Singh
3. Central Excise Law Guide – R.K.Jain

SECOND YEAR   IV – SEMESTER
ACCOUNTING STANDARDS & CORPORATE REPORTING

Hours: 6/week   90 Hrs   Sub. Code: P1CME41
Credits: 5

OBJECTIVES:

- To provide a theortical foundation for the prepartation and presentataion of financial statements.
- To gain working knowledge of accounting standards and their application to different practial situations.

Unit – 1 (18-hours)

Accounting Standard: Meaning – benefits – limitations.

 Valuation of inventories (AS – 2): Definition of inventories – cost of inventories –Exclusion from cost of inventories – Net Realisable value.

Deprecitation Accounting (AS – 6): Methods of depreciation – change in deprecitaion method – change in th ecost of asset – change in estimate life.

Unit – 2 (18-hours)

Contingencies and Events Occurring after the Balance sheet date (AS – 4): Meaning and examples of contingency – Events after balance sheet date: Adjusting events and Non-adjusting events.

Net profit or loss for the period, prior items and change in accounting policies (AS-5): Components of net profit: Ordinary activities, Extra ordinary items – prior period items: Meaning, examples – change in accounting estimate – change in accounting policies.

Unit – 3 (18-hours)

Construction contracts (AS-7) : Meaning – Types – Contract Revenue – Contract costs- Basis of Recognition of Contract revenue and expenses: percentage Completion method – Determination of stage of completion.

Provisions, Contingent Liablities and Contingent Assets (AS-29) : Meaning of provision, Characteristics – Contingent liability: Meaning, Characteristics – Contingent asset: Meaning, Characteristics – Conditions to recognize the provisions in the books of accounts – Recognition principles of Contingent liability – Recognition principles of Contingent asset.

Unit – 4 **(18-hours)**
Borrowing cost (AS – 16): Definition – Qualifying asset – Capitialisation of borrowing cost. Earning pershare (AS – 20): Basic earnings pershare – Diluted Earnings pershare.

Unit – 5 **(18-hours)**
Cash flow statement (AS – 3): Cash - cash equalivants – Operating activites – Investment activities – financing activities – cash flow from operating activities: Direct method – Indirect method.

TEXT AND REFERENCE BOOKS
1. "Students' Referencer on Accounting Standards": G.Sekar, B.Saravana Prasath and G. Saimukundhan, C.Sitaraman &Co. Pvt. Ltd, 2013
2. "Indian Accounting Standards: Practices, Comparisons, and Interpretations": Asish K. Bhattacharya, TATA McGraw Hill, 2013.
3. "Students Guide to Accounting Standards": D.S.Rawat, Taxmanan Publication Pvt. Ltd, 2013.

Question paper should provide 60% credit to problems and 40% credit to theory.

M.Com with Computer Application Degree Course (semester)
Under Choice Based Credit Systems

Semester	Subject	Hrs	Credit	Int+Ext =Total	Subject Code	Revision
III	BUSINESS ENVIRONMENT	6	5	25+75=100	P1CCC31	Revised
	ELECTIVE 3: SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT	6	5	25+75=100	P1CCE31	New
	Direct Tax	6	5	25+75=100	P1CCC32	Revised
	ADVANCED JAVA	6	4	25+75=100	P1CCC33	New
	LAB: ADVANCED JAVA LAB	6	3	25+75=100	P1CCC3P1	New
IV	Financial Management	6	5	25+75=100	P1CCC41	Revised
	ELECTIVE 4: Financial Markets And Services	6	5	25+75=100	P1CCE41	New
	Research Methodology	6	4	25+75=100	P1CCC42	Revised
	System Analysis And Design	6	4	25+75=100	P1CCC43	New
	Project Work and Viva Voce	6	3	25+75=100	P1CCC4PV	No Change

3.1 BUSINESS ENVIRONMENT

Total Hours:90   **Credit: 5**   **Hours per week:6**
Subject Code: P1CCC31

Objective: To Enable the Students to acquire Knowledge on Business Environment

(18 hours)
Unit –I Nature, Scope and Social aspects of Business Environment: Levels of Environment - Internal Environment - External Environment – Competitive Structure of Industries - International Business Environment.

(18 hours)
Unit –II Economic Environment - Monetary Policy - Physical Policy, Legal Environment - Laws relating to Business Environment -Industries (Development & Regulation) Act - MRTP Act -FERA -FEMA.

(18 hours)
Unit –III   Social and cultural environment - Social issues in business: Business Ethics - Social Responsibility of Business - Environmental Issues - Labour Issues - Corporate Governance - Technological Environment.

(18 hours)
Unit –IV New Economic Policy: Background to the New Economic Policy - Liberalization - Privatization and Globalization - Impact of Globalization in Indian Economy - EXIM Policy -

Role of Government in Promoting Exports - ECGC - Export Trade Zones - Foreign Direct Investment - Limitations and Dangers of FDI.

(18 hours)

Unit –V International Organizations: International Monetary Fund, World Bank, International Development Association - International Finance Corporation – Asian Development Bank, INCTAD, UNIDO, International Trade Centre, WTO, GATT.

TEXT BOOKS:
1. Essentials of Business Environment - Aswathappa K
2. Global Economy and Business Environment - Francis Cherunilam

REFERENCE BOOKS:
1. Business Environment - Sankaran S
2. Government and Society - Maheswari & Gupta
3. Indian Economy – Rather Dutt & Sundaram K.P

3.2 SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

Subject Code: P1CCE31
Total Hours:90   **Credit: 5**   **Hours per week:6**

Objective: To enable the students to understand various techniques of analysis used in investment decisions, portfolio analysis and efficient portfolio management

(18 hours)

UNIT – I Security Market Analysis: Investment environment Types of return and risk; Sources of risk Technical Analysis Fundamental Analysis: Economic Analysis, Industry Analysis, Company Analysis

(18 hours)

UNIT – II Forms of Market Efficiency and Valuation of Securities: Random Walk Theory Form of Market efficiency Analysis of Bond/ Debentures: Valuation of bonds Analysis of risk in bonds-duration and convexity Valuation of Equity and Options

(18 hours)

UNIT – III Portfolio Management: Nature, Scope – SEBI Guidelines to Portfolio Management – Port folio Investment Process – Elements of Portfolio Management – Portfolio Revision – Needs and Problems.

(18 hours)

UNIT – IV Portfolio Theory, Construction & Evaluation: Capital Market Theory- CAPM, Risk Free Lending Borrowing Arbitrage Pricing Theory Techniques of Portfolio Construction Active and Passive portfolio management Bond portfolio management strategies-passive, semi-active and active along with immunization strategies Portfolio Performance Evaluation

UNIT – V Investment Alternatives: Investment in Equity Shares, Preference shares, Bonds, Government Securities – Mutual Funds – Real Estate – Gold – Silver – Provident fund – Unit Trust – National Savings Scheme – LIC.

TEXT BOOKS:
1. Modern Investment & Security Analysis - Fuller & Farrel ,(McGraw Hill, International Edition, 2000)
2. Investment Analysis - Singh, Preeti, (Himalaya Publishing House, 2005)

REFERENCE BOOKS:

1. Investments - Sharoe, & Bailey, Alexander (Eastern Economy Edition, 1999)
2. Portfolio Management Handbook - Strong, Robert. A (Jaico Publishing House, Delhi,2003)
3. Security Analysis & Portfolio Management. Jordan & Fischer (Prentice Hall India N. Delhi, 2007)
4. Security Analysis & Portfolio Management - Avadhani, V.A (Himalaya Publishing House, 2005)
5. Investment Mgt. and Portfolio Management - Ramaguntham & Madhumati (Pearson, New Delhi, 2004)

3.3 DIRECT TAXES

Subject Code: P1CCC32

Total Hours:90   **Credit: 5**   **Hours per week:6**

Objective: To Enable the Students to acquire Knowledge on Direct Taxes

UNIT-I   **(18 hours)**

Basic concepts - Definitions - Assesses - Assessment year - Previous Year - Income - Residential Status - Scope of Total Income - Exempted income - Agricultural income - Capital income and expenditure - Revenue Income and expenditure.

(18 hours)

UNIT-II

Heads of Income - Income from Salaries - Income from House property

(18 hours)

UNIT-III

Income from Business or Profession - Depreciation. Income under the head capital gains - Income from other sources.

(18 hours)

UNIT-IV

Set off and Carry forward of losses - Deductions from Gross Total Income. Computation of Total Income – Rates of Tax - Assessment of Individual - Firm - Companies - MAT - Tax Deducted at Source - Advance Tax - Interest payable - PAN.

(18 hours)

UNIT-V

Assessment Procedure - Income tax Authorities - Penalties - An outline of Wealth Tax - Computation of Net wealth.

TEXT BOOKS

1. Income Tax Law and Practice - Gaur V.P & Narang K.L, Kalyani Publishers, New Delhi.
2. Direct Taxes - Dr. Vinod Sighania, Tax Mannan Publications, New Delhi.
3. Income Tax Theory, Law and Practice –T.S.Reddy and Y.Hariprasad Reddy

REFERENCE BOOKS

1. Income Tax Theory, Law and Practice –Jayakumar A. & C.Dhanapal - Learnetech Press, Trichy
2. Income Tax Law and Practice, Dinkar Pagare, Sultan Chand & Sons, New Delhi.

3.4 ADVANCED JAVA

Subject Code: P1CCC33

| **Total Hours:90** | **Credit:4** | **Hours per week:6** |

Objective: To Enable the Students to acquire Knowledge on Advanced Java Language

UNIT I **(18 hours)**

Introduction – Simple java program - An Application with Two Classes - Java Program Structure – Implementing a Java Program – Java Virtual Machine – Constants – Data types – Operators – Expressions.- Introduction – Defining a class – Fields Declaration – Creating Objects – Accessing Class Members – Constructors – Methods Overloading.

UNIT II **(18 hours)**

Inheritance: Extending a Class - Defining a Sub class – Subclass Constructor – Multilevel Inheritance - Hierarchical Inheritance – Overriding Methods- Introduction - One Dimensional Arrays – Creating an array – Two dimensional arrays – Strings – Interfaces - Packages-Multithread Programming

(18 hours)

UNIT III

JDBC objects - The concept of JDBC - JDBC driver types - JDBC packages - A brief overview of the JDBC process - database connection - Exceptions - Tables - Indexing - Inserting data into tables - selecting data from table- Updating tables - Deleting data from a table - Joining tables - calculating data Grouping and Ordering Data - Sub queries - View.

(18 hours)

UNIT IV

Java Servlets - Java servlets and CGI programming - A simple java servlet - Anatomy of a Java Servlet - Reading data from a client - reading HTTP Request Headers - Sending Data to a client and Writing the HTTP response Header - Working with cookies - tracking sessions.

(18 hours)

UNIT V

JSP - JSP tags - Tomcat - Request String User sessions - Cookies - Session Objects.

Text Books:

> 1.J2EE- The complete reference -Jim Keogh TMH 2005
> 2.The Complete Reference Java2-Patrick Naughton, Herbert Schildt-TMH edition

BOOKS FOR REFERENCE:

1. Programming with Java-E.Balagurusamy fourth edition
2. The J2EE Tutorail-Foreword by Kathy Walrath
3. Java Servlet-Ramesh Bangia

3.5 LAB: ADVANCED JAVA LAB

Subject Code: P1CCC3P1

| **Total Hours:90** | **Credit: 3** | **Hours per week:6** |

1. Write a Java program to find the rank of the students.
2. Write a Java program to perform the compare two strings operations.
3. Write a java program to perform matrix multiplication
4. Write a java program to perform matrix addition and subtraction.
5. Write a java program to implement the Thread.
6. Write a java program to removing white space in string using package.
7. Write a java program using inheritance.

8. Write a java program to implement overriding
9. Display current data using JSP
10. Display IP address of the computer using JSP
11. Counting the number of page hits using JSP
12. Display Hello world using doget() method
13. Create your resume using servelt
14. Print hello to the browser using dopost() method.
15. Write a program to create table and insert data using JDBC
16. Write a program to delete a row, update a table
17. Write a program to update a table under transaction processing using JDBC

4.1 FINANCIAL MANAGEMENT

Subject Code: P1CCC41

Total Hours:90   **Credit: 5**   **Hours per week:6**

Course Objective:

The objective of this course is to help students to understand the conceptual framework or financial management, and its applications under various environmental constraints.

(18 hours)

UNIT - I Financial Management: Meaning - nature and scope of finance - Financial goal-profit Vs wealth maximization; Finance function investment, financing and dividend decisions.

(18 hours)

UNIT - II Capital Budgeting: Nature of Investment decisions; Investment evaluation criteria – Pay Back period - ARR - NPV and IRR.

(18 hours)

UNIT - III Working Capital Management – Cash Management – Receivables Management – Inventory Management – Determinants and Computation of Working Capital.

(18 hours)

UNIT - IV Cost of Capital: Meaning and significance of cost of capital; Calculation of cost of debt, preference capital, equity capital and retained earnings; Combined cost of capital (weighted). **Capital Structure:** Traditional Theories and M.M. approach – Determining capital structure in practice. **Operating and Financial Leverage:** Measurement of leverages; Effects of operating and financial leverage on profit; Analysing alternate financial plans; Combined leverage.

(18 hours)

UNIT - V Dividend Policies: Meaning - Determinants of Dividend policy – Types of Dividend policy -Walter's model, Gordon's model, M.M Approach; Dividend policy in practice - Forms of dividends - Stability in dividends policy; Corporate dividend behaviour.

TEXT BOOKS:

1. Financial Management,I.M.Pandey, Vikas Publising House Pvt Ltd., New Delhi.

2. Financial Management, S.N. Maheshwari, Tata Mc Graw- hill Publishing Co. ltd., New Delhi.

3. Financial Management My.Khan and P.K.Jain, Tata Mc Graw- hill Publishing Co. ltd., New Delhi.

4. Financial Management – Shashi K.Gupta, P.K.Sharma.

BOOKS FOR REFERENCE:

1. Financial Management and Policy,James C. Van Horne Prentce Hall of India, New Delhi.

2. Financial Management, D.Chandra Bose PHI Learning Private Limited
Note: Question paper shall cover 60% Theory and 40% Problems.

4.2 FINANCIAL MARKETS AND SERVICES

Subject Code: P1CCE41
Total Hours: 90   **Credit: 5**   **Hours per week:6**
 Objective:

    The objective of this course is to help students to understand the conceptual framework of various financial markets and services.

UNIT – I   **(18 hours)**

    Capital Market – Meaning – Capital Market in India – Deficiencies in the capital Market – Future of the Capital Market – Recent Trends in Indian Capital Market – **Money Market** – Meaning – Special Characteristics of Money Market – Objectives of Money Market – Pre-requisites for and Efficient Money Market – Importance of Money Market – Indian Money Market – Weaknesses of Indian Money Market –Structure of Indian Money Market.

 UNIT – II   **(18 hours)**

    Mutual Fund – Definition – Attributes of Mutual Funds – A Comparative Study of Mutual Fund with other forms of Savings – Advantages & Disadvantages of Mutual Fund Investment – Types of Mutual Fund – Growth of Mutual Funds in India - Structure of Indian Mutual Funds – Mutual Fund Schemes in India – Parties of Mutual Fund – SEBI Guidelines.

UNIT- III   **(18 hours)**

    Factoring – Forfeiting- Securitization- Venture capital Consumer finance and credit cards- Salient features, FBI guidelines, functions.

 UNIT IV   **(18 hours)**

    Merchant Banking including initial public offer and public issue management- Underwriting- Stock and Security broking- Merger and Takeover- Salient features- Guidelines- Functions.

UNIT V   **(18 hours)**

    Derivatives – Meaning – Futures –Meaning –Options – Meaning – Swaps – Meaning – Recommendations of the L.C.Gupta Committee – Recommendations of SEBI's Technical Group on New Derivative Products – Internet Trade – Negotiated Deals.

TEXT BOOKS:
1. Financial Management - I.M Pandey, Vikas Publishing House (P) Ltd
2. Financial Services and Stock Exchanges - Dr.N.Premavathy
3. Financial Markets & Services – Gardon & Natarajan

REFERENCE BOOKS:
1.Investment Management - Avadani – Himalayan Publishing, House Mumbai- 4
 2.Indian Financial System - H.R. Machiraju - Himalayan Publishing, House Mumbai – 4
3. Financial Markets and Institutions - Dr. S. Gurusamy- Vijavy Nicolas Imprints Pvt. Ltd., Chennai- 28

4.3 RESEARCH METHODOLOGY

Subject Code: P1CCC42

Total Hours:90	**Credit: 4**	**Hours per week:6**

Objective: To Enable the Students to acquire Knowledge on Research Methodology

(18 hours)

UNIT - I

Meaning of Business Research – Types of Research – Descriptive, Exploratory, Experimental – Historic – Pure and Applied – Research problem – Research Design – Components of Research Design.

(18 hours)

UNIT - II

Sampling – Census – Universe / Population – Sample – Sampling Techniques- Random and Non Random Sampling – Sampling frame – Size of the sample – Sampling and Non Sampling Errors.

(18 hours)

UNIT III

Collection of Data – Primary and Secondary Data – Tools of Collection of Data – Questionnaire – Interview Schedule – Observation - Precautions to be taken while applying Statistical tools – Pilot study and pre- testing.

(18 hours)

UNIT IV

Analysis and Interpretation of Data – Hypothesis – Procedure – Testing hypothesis – Parametric and Non parametric tests – T test and ANOVA – Sign tests- McNemer Test-wilcoxon Matched pairs test-Kruskal Wallis test.

(18 hours)

UNIT V

Research Report – Types of reports – Target audience – Steps in drafting a Research Report – Contents of a research report – Title pages – Table of Contents – Body of the report – Appendices – Bibliography.

Text Books:

1. Research Methodology : methods and techniques C.R.Kothari, New Delhi Wiley Eastern Ltd.,
2. Research methodology in social science - Thanulingam N. Coimbatore, Rainbow Publishers.

Reference Books:

1. Research Methods in Commerce – Amarchand D, Emerald Publishers, Chennai.
2. Thesis and Assignment writing – Anderson J. Berry H.D & Poole, New Delhi, M. Wiley Eastern Limited.
3. Research Methods in Economic and Social Sciences. - . Kurien C.R.

4.4 SYSTEM ANALYSIS AND DESIGN

Subject Code: P1CCC43

Total Hours:90	**Credit: 4**	**Hours per week:6**

Objective: The system analysis and design is backbone of development, after studying the subject the students will be able to develop, the design of system according to given requirements. It involves various steps in analysis and design at the system.

(18 hours)

UNIT - I

Introduction to Information System Development: Meaning – Business System concepts – Categories of Information systems – System development Strategies. Managing the application development portfolio: How system projects have begun – Managing project review and selection – Preliminary investigation – Selecting the project development strategies.

(18 hours)

UNIT - II

Tools for determining system requirement: Meaning – Fact finding techniques – Tools for documenting procedure and decision. Structured Analysis development strategies: Structured Analysis – Developing Data flow diagrams. Computer Aided Systems Tools: Role of Tools – Categories of automated Tools – CASE Tools – Benefits of CASE.

(18 hours)

UNIT – III

Specifying Application requirements: Objectives in designing Information systems – - Features - Design of computer output: identification of computer Output needs – Present information – Designing printed output – Designing visual concerns guide input design – Capturing data for input – Input validation.

(18 hours)

UNIT - IV

Design of online dialogue: Meaning – Interface – Designing dialogue – Dialogue strategy – Data entry dialogues. Design of files and use of auxiliary storage devices: Basic file terminology – Data Structure Diagrams – Types of files – Methods of file organization.

(18 hours)

UNIT - V

Systems engineering and Quality assurance: Design objectives – Program structure charts – Design of Software – Managing Quality assurance – Managing testing practices. Training – Conversion – post implementation review. Estimation and management of development time – Estimation – Personnel and development management. Hardware selection – Software Selection.

Text Book:
1. System Analysis and Design, Awad. Elias; Galgotia Publication

Reference Books:
1. System Analysis and Design an a Changing World- Satinger- Jackson- Burd
Thomson baming publication
2. System Analysis and Design by Jeffrey and lawrance PHI publication
3. Introduction to System Analysis and Design, Galgotia publication by Lee

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4.5 PROJECT WORK AND VIVA-VOCE

Subject Code: P1CCC4PV

Dissertation 75 Viva Voce 25　　　　　　　　**Credit: 5**　　　　　**Total Marks100**

Guidelines for Project Work:

　　　(a) **Topic**:

The topic of the project work shall be assigned to the candidate before the end of second semester.

　　　(b) **No. of copies of the Project Report:**

The students should prepare two copies of the project report and submit the same for the evaluation by Examiners. After evaluation one copy is to be retained in the college library and one copy can be returned to the student.

(c) Format to be followed:

The formats / certificate for project report to be submitted by the students are given below:

Format for the preparation of project report:

      (a) Title page

      (b) Bonafide Certificate

      (c) Acknowledgement

      (d) Table of contents

      (e) Text of the project

      (f) Bibliography

      (g) Appendix

Course Name : Bachelor of Business Administration

Sem.	Part	Subject	Hours	Credits	Int+Ext =Total	Subject Code	**Revision**
III	Core 5	BUSINESS LAW-I	5	4	25+75+100	U1BAC31	Revised
	Core 6	BANKING LAW AND PRACTICE	5	4	25+75+100	U1BAC32	Revised
	Core 7	FUNDAMENTALS OF COMPUTER	5	4	25+75+100	U1BAC33	Revised
	Core 8	ORGANISATIONAL BEHAVIOUR	5	4	25+75+100	U1BAC34	Revised
	Allied 3	BUSINESS STATISTICS	6	5	25+75+100	U1MAA3B	Revised
	SBE 1	MS-OFFICE – PRACTICALS	2	2	25+75+100	U1BAS3P1	Revised
	SBE 2	BODY LANGUAGE	2	2	25+75+100	U1BAS31	Revised

Sem.	Part	Subject	Hours	Credits	Int+Ext =Total	Subject Code	Revision
IV	Core 9	BUSINESS LAW-II	6	4	25+75+100	U1BAC410	Revised
	Core 10	MARKETING MANAGEMENT	5	4	25+75+100	U1BAC420	Revised
	Core 11	COMPUTER APPLICATIONS IN BUSINESS	5	4	25+75+100	U1BAC430	Revised
	Elective 1	ENTREPREUNEURSHIP	6	5	25+75+100	U1BAE410	Interchanged and Revised
	Allied 4	BUSINESS MATHEMATICS	6	5	25+75+100	U1MAA4B	Revised
	SBE 3	WEB DESIGNING LAB	2	2	25+75+100	U1BAS4P1	New

SEMESTER III
BUSINESS LAW – I

Contact Hours per week: 5   **Subject Code: U1BAC31**

Contact Hours per semester: 75   **Credits: 4**

Objectives:

1) To enable the students to secure a basic general knowledge in business law.

Placed in the Academic Council Meeting held on 23.03.2013   Annexure I   B.B.A.

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2) To understand the impact of various business laws on business.
3) To develop skills so as to apply the law of business to various practical situations
4) To acquaint themselves with latest developments in the field of business law.

UNIT-I : Law of Contract – Nature – Definition of Contract – Essential Elements of a valid contract – Classification of Contracts – Indian Contract Act, 1872   (15 Hours)

UNIT-II : Offer, Acceptance Offer – Legal rules as to Offer – Meaning of Acceptance – Definition of Consideration - Legal rules as to consideration – Stranger to Contract – Without Consideration – Meaning of consent , Free consent – Coercion – Undue Influence – Misrepresentation – Mistake – Fraud – Distinction between fraud and misrepresentation – Case laws.   (15 Hours)

UNIT-III : Performance, Discharge, remedies for Breach of Contract and Quasi Contract. Void Agreements - Wagering Agreements – Restitution – Rules regarding contingent Contracts - Contracts which need not be performed - Performance of Contract - Right – Rescission – Damages – Penalty – Injunction – Kinds of Quasi Contract – Case laws.   (15 Hours)

UNIT-IV : Contract of Agency – Definition of Agent and Principal – Creation of Agency – Classification of Agents – Relation, Duties and Rights of an Agent and Principal. Delegation of Authority – Termination of Agency – Case laws.   (20 Hours)

UNIT-V :
Sale of Goods Act – Contract of sale – agreement to sell – Documents of title to goods – conditions and warranties – Rights of buyer – Rights of Unpaid seller - Law of Partnership; Definition of Partnership - Partnership   Deed – Types of partners - Duration of firms - Registration of Partnership firms – rights and duties of partners – Dissolution of firms.
                                                                                          (10 Hours)

Text Book:
1. Elements of Mercantile Law – N.D.Kapoor.
Books For Reference :
1. Indian Mercantile Law-Davar.
2. Legal Aspects of Business-Akileshwar & Pathak, Tata McGraw Hill Ltd.
3. Business Law – P.C. Tulsian (TMH)

BANKING LAW AND PRACTICE

Contact Hours per week: 5   **Subject Code: U1BAC32**
Contact Hours per semester: 75   **Credits: 4**
Objectives:
  1) To enable the students to secure a basic general knowledge in business law.
  2) To understand the impact of various business laws on business.
  3) To develop skills so as to apply the law of business to various practical situations

4) To acquaint themselves with latest developments in the field of business law.

UNIT-I : Meaning and definition of Banker – Meaning and definition of customer – General Relationship between Banker and customer – Obligation to honour cheques – Obligation to maintain secrecy of customer's accounts – Bankers Rights : Lien, Set-off, Appropriation of Payments.   (15 Hours)

UNIT-II: Types of Deposits – Current account, Savings account, Fixed Deposit and Recurring Deposit – Fixed Deposit Receipt and its legal implications – General Precautions for opening account. Pass Book: Meaning – Legal aspects of entries in the passbook – Effects of wrong entries favorable to customers – effects of wrong entries favorable to banker. Special Types of customers: General procedure for opening accounts in the names of Minor, Married woman, Illiterate, Lunatic, Partnership firm, Joint stock company - Non-trading concern and Joint Account.   (15 Hours)

UNIT-III: Negotiable Instruments: Definition – Types – Essential features of Negotiable Instruments. Cheque: Meaning and Definition - Essentials of a valid Cheque – Cheque Vs Bill of Exchange - Material Alteration: Meaning – Effects of material alteration – Banker's duty – Immaterial Alteration. Marking: Meaning and Significance – cases. Crossing: Meaning – Forms of crossing – Significance of various forms of crossing. Endorsement: Meaning and Definition – Kinds and significance – Regularity of endorsement.   (15 Hours)

UNIT-IV: Paying Banker: Meaning – Duties of a paying Banker – Circumstances for dishonoring a Cheque – statutory protection under sec.85 of the Negotiable Instruments Act – Forgery of customer's signature – Payment in due course – Holder in due course. Collecting Banker: Meaning – Capacity of the collecting Banker - Duties of collecting Banker – Statutory Protection - Concept of Negligence – conversion.   (15 Hours)

UNIT-V: General Principles of Bank lending – Secured advances and unsecured advances – Secured Vs unsecured advances – Types of advances – Loan, cash credit, Overdraft and Bill discounting – Modes of creating charge: Lien, Pledge, Mortgage and Hypothecation – Types of mortgage.   (15 Hours)

TEXT BOOK
 1.   Banking Theory Law and Practice – Gorden,E. and Natarajan.

REFERENCE BOOKS
1. Banking Law and Practice – Varshney, P.N – Sultan Chand & Son's New Delhi.
2. Banking Theory and Practice – Mithani, D. and Gordon, E. Himalaya publishing House, Mumbai.
3. A Text book of Banking – Radhasamy, M. and Vasudevan S.V.S.Chand & Co., New Delhi.
4. Banking Law and Practice – Kandasamy, K.P., Natarajan S., and
                               Parameswaran R.

FUNDAMENTALS OF COMPUTER

Contact Hours per week: 5   **Subject Code: U1BAC33**
Contact Hours per semester: 75   **Credits: 4**

Objectives:

1) To impart the basic knowledge about windows operating system.
2) To introduce word processing concepts.
3) To inculcate the knowledge of electronic spreadsheets.
4) To develop the knowledge of creating presentations using PowerPoint.

Unit – I : Introduction to computers : Definition – Characteristics and capabilities of computers – Generations of computers – classification of computers – Types of computers – Basic principles of operation of a digital computer – Block diagram of computer System – Hardware – CPU, memory (Primary and Secondary) – Input devices, output devices – uses and applications of Computers.   (15 Hours)

UNIT-II: WINDOWS XP – Introduction to Windows XP - Features – Basic components: Desktop, Icons, Task bar and Channel bar – Start menu – Files and Folders – Windows Explorer – Internet Explorer – Control Panel – Shortcuts – Briefcase.   (15 Hours)

UNIT-III : MS WORD – Introduction to word processing and MS WORD – Components of Word opening Screen – Creating Word documents. Entering, Editing, Copying and moving text- Applying Fonts and Font Styles - Creating bulleted and numbered lists – types of views – spell checker and Grammar – Aligning and formatting Text – Auto format - AutoCorrect – Creating Tables and working with tables – Mail merge.   (15 Hours)

UNIT-IV: MS – EXCEL: Introduction to spread sheet – components of EXCEL Opening Screen – Building worksheet. Entering data in worksheet – Editing, Deleting, Copying and moving cells and ranges – Adjusting column width and row height – inserting and deleting cells, rows and columns – using auto–fill - creating and working with formula – functions in Excel - Graphs and charts : Types of charts – Element of a chart – Creating a chart.   (15 Hours)

UNIT V: MS POWERPOINT: Meaning and Features – Presentation: Creating a presentation using Auto content wizard, Design templates and Blank presentation – Types of views – Opening an existing presentation – editing saving and closing a presentation – Enhancing presentation: Applying Transition effects and animation effects – Spell checking the presentation and adding speaker notes – Inserting objects: Inserting a graph, organization chart, clip Art, sound and video – Running slide show.   (15 Hours)

Text Book:
1. Computer Application in Business: S.V. Srinivasa Vallbhan, Sulthan
   Chand & Sons, New Delhi.

Reference Books :
1. Fundamentals of Computer: V. Rajaraman, Prentice Hall of India
2. Fundamentals of Computers: P.K. Sinha.
3. MICRO SOFT OFFICE: Gini Courter and Annette Margins,
   Publications,
   New Delhi.
4. MICRO SOFT OFFICE FOR WINDOWS: Steve Saga, Peachpit Press.

ORGANISATIONAL BEHAVIOUR

Contact Hours per week: 5   **Sub Code: U1BAC34**

Contact Hours per semester: 75   **Credits: 4**

Objectives: The objective of this subject is to import the knowledge on the behaviour of individual,group and the overall organization in different aspects and how to manage stress and conflict situation**.**

UNIT-I: Organizational behaviour – definition – features of Organizational behaviour –various approaches to study of Organizational behaviour –process of Behaviour- Models of Organizational behaviour.   (15 Hours)

UNIT-II: Group dynamics-definition –types of groups –theories of group formation –problems of informal groups –Group norms - Types ,meaning of Group cohesiveness –five stages of group development – Individual goals and Group goals.   (15 Hours)

UNIT-III: Definition of morale-factors affecting morale –cause of low morale – factors improving morale – Meaning ,definition and features of Conflict- types of conflict situations – causes of conflict –conflict management –preventive measures and curative measures.

       (15 Hours)

UNIT-IV: Stress management –meaning and definition –nature of Stress –Sources – Organisational, extra organizational , group Stressors and individual Stressors –consequences of Stress –coping strategies for Stress – Individual approaches and organization approaches.

       (15 Hours)

UNIT-V: Meaning of Change –forces for change –types of change –managing planned change – planning, assessing and implementing the change –causes of resistance to change –overcoming resistance to change - Meaning and definition of organizational Development –characteristics – need –benefits –limitations-steps in OD.   (15 Hours)

TEXT BOOK
1. Organisational Behaviour – Shashi K.Gupta & Rosy Joshi

Reference Books:
1. Organisational Behaviour – Stephen P.Robbins, Pearson Publishers, 2011.
2. Organisational Behaviour- L.M.Prasad-Sultan chand &sons

BUSINESS STATISTICS

Contact Hours per week: 6   **Subject Code:** U1MAA3B
Contact Hours per semester: 90   **Credits: 5**

OBJECTIVE:
    To provide basic skills on the usage of statistical tools to analyze business data.

UNIT – 1   **(18-hours)**
    Statistics: definition – functions – importance – limitations – methods of collection of data: primary – secondary – sampling: meaning – methods – classification and tabulation: meaning – types of classification – tabulation of data – difference between classification and tabulation – rules for tabulation - diagrammatic and graphic representation.

UNIT – 2   **(18-hours)**
    Arithmetic mean – geometric mean – harmonic mean – median – mode.
    Range – quartile deviation – mean deviation – standard deviation – co-efficient of variation (combined standard deviation excluded).
    Skewness – methods – Karl pearson's co-efficient of skewness – Bowley's co-efficient of skewness.

UNIT – 3   **(18-hours)**
    Correlation – Scatter diagram – Karl pearson's co-efficient of correlation – Rank correlation (concurrent deviation method excluded)

UNIT – 4   **(18-hours)**
    Regression analysis – regression equation – least square method – actual mean method.
    Index number – types – tests – consumer price index number.

UNIT – 5   **(18-hours)**
    Analysis of time series – components – methods of determining trend – graphic – semi average – moving average – least square.

BOOKS RECOMMENDED
1. R.S.N. Pillai and V. Bagavathi – Statistics
2. Sancheti kapoor - Statistics – theory , methods and application
3. S.P. Gupta- Business statistics
4. K. Alagar - Business statistics

Question paper should provide 80% credit to problems and 20% credit to theory.

MS OFFICE PRACTICALS

Contact Hours per week: 2   **Sub Code: U1BAS3P1**
Contact Hours per semester: 30   **Credits: 2**

Objectives:
1) To impart the basic knowledge about windows operating system.
2) To introduce word processing concepts.
3) To inculcate the knowledge of electronic spreadsheets.
4) To develop the knowledge of creating presentations using PowerPoint.

WINDOWS   (6 Hours)
1) Working with Paint
2) Working with WordPad
3) Working with Notepad

MS WORD   (10 Hours)
1) Creation of Documents
2) Applying different Formatting options
3) Inserting Header, Footer, Subscript and Superscript
4) Creating Greetings using Clip Art and Word Art
5) Designing Advertisements
6) Working with Tables
7) Inserting Charts, Pictures and Tables in word document
8) Creating Numbered List and Bulleted Texts.
9) Working with Mail Merge

MS EXCEL   (7 Hours)
1) Creating Employee Worksheet
2) Creating Student Worksheet
3) Creating Invoice Report.
4) Creation of different types of Chart
5) Working with Formulae and Functions
6) Using Auto fill

MS POWERPOINT   (7 Hours)
1) Creating Presentations using Auto Content Wizard
2) Creating Presentations using Design Templates
3) Applying different Animation and Transition Effects in Presentations
4) Inserting Clip Art, Chart, Image, etc., in Presentations.

BODY LANGUAGE

Contact Hours per week: 2   **Sub Code: U1BAS31**
Contact Hours per semester: 30   **Credits: 2**

Objectives

   The objective of this subject is to develop the basic concepts of unspoken language and its multifaceted aspects.

Unit I: Body Language – Meaning, types, Role in Interpersonal communication – Body Language during Job Interviews.   (6 Hours)

Unit II: Facial Expressions – Significance and types - Face and First impression – Face facts.   (6 Hours)

Unit III: Eye Contact – Use of Eye contact, Eye Grammar, Making best utilize of your Eye contact.   (6 Hours)

Unit IV: Postures and Gestures – Meaning, Kinds of Posture, Mind reading through Posture – Leg Gestures – Hand and Arm Gestures – Hand to Face Gestures.
                        (6 Hours)

Unit V: Body Language for Sales and Marketing Executives – Significance - Adopted worldwide by Salespeople.   (6 Hours)

Textbook:

   Body Language (your success mantra) – Shalini Verma, S.Chand Publications.

Reference Books:

   1) Understanding Body Language – Vinay Mohan, Purtak Mahal Publications.
   2) Body Language – Ashish Dutta, Goodwill Publishing House.

SEMESTER IV
Core Paper 9 - BUSINESS LAW II

Contact Hours per week: 6   **Subject Code: U1BAC41**
Contact Hours per semester: 90   **Credits: 4**
Objectives:

   1) To enable the students to secure a basic general knowledge in business law.
   2) To understand the impact of various business laws on business.
   3) To develop skills so as to apply the law of business to various practical
         situations
   4) To acquaint themselves with latest developments in the field of business law.

Unit – I: Factories Act, 1948 Definition – Inspecting Staff – Health – Safety – Welfare – Working Hours of Adults – Holidays – Employment of Young persons and women – Annual Leave with wages. Object of Industrial Disputes Act – Definition of Industrial Dispute – Grievance Settlement Authorities – Conciliation machinery – Procedure. Power and Duties of Authorities – Reference of Disputes to Boards, Courts or Tribunal. National Tribunal – Strikes, Lock-out, Lay-off-Retrenchment – Unfair Labour Practices – Penalties.   (20 Hours)

Unit – II: Industrial Employment Act, 1946 & Trade Unions Act, 1926. Definition of Standing orders – Submission and Draft of Standing orders – Certification of Standing Order – Definition of Trade Union – Registration of Trade Union – Cancellation of Registration and Appeal – Amalgamation and Dissolution – Penalties.   (20 Hours)

Unit – III: Payment of Wages Act – Definition of wages – Rules for Payment of wages – Deductions – Inspectors – Fixation and Revision of wages – Advisory Boards – Safeguards in Payment of Minimum wages. A Definition of Gratuity – Payment of gratuity – forfeiture of gratuity – Determination of recovery of gratuity – employees Provident fund scheme - Pension Scheme – Employee's Deposit linked Insurance Scheme – Administration of the Scheme- Scope and Coverage of Maternity Benefits. (20 Hours)

Unit – IV: Workmen's Compensation Act, 1923.Definition – Scope and Coverage – Rules regarding workmen's Compensation – amount of Compensation – distribution of Compensation – Enforcement of Act. (15 Hours)

Unit – V: Payment of Bonus Act & Apprentices Act, 1969. Meaning of Bonus – Definition – Eligibility for Bonus – Disqualification for bonus – Consumer Protection Act. (15 Hours)

Text Book
1. Elements of Mercantile Law – N.D.Kapoor sultan Chand & Son's

Reference:
1. Indian Mercantile Law – R.S. Davar.

MARKETING MANAGEMENT

Contact Hours per week: 5   **Sub Code: U1BAC42**

Contact Hours per semester: 75   **Credits: 4**

Objectives:
1. To develop a basic knowledge on concepts of Marketing and Services.
2. To equip the students about product Planning Polices.
3. To provide an information about Pricing methods and Channel of Distribution.
4. To know the Fundamental ideas about Rural Marketing

UNIT-1: Marketing –definition – importance – Approaches to the study of marketing - nature and scope of marketing – market and classification of markets - marketing management and its evolution concept of marketing mix — consumer behavior – meaning and definition buying motives – consumer decision making process. (15 Hours)

UNIT-2: Product –features of product - product classification –product policies –product mix – new product planning and development - product life cycle – Reasons for product failures – branding, packaging and labelling. (15 Hours)

UNIT- 3: Pricing: Pricing objectives – factors influencing pricing decisions - kinds of pricing – new product pricing - Steps in price determination – pricing problems - Channels of distribution: Meaning and definition - channel functions – Types of channel of distribution - factors considered in channel selection – Middlemen – functions of middlemen – Motivating channel members. (15 Hours)

UNIT-4: Advertising –meaning, definition and importance – features of advertising -objectives - types of advertising - advertisement copy: qualities of good advertisement copy – kinds of copy - advertising media – types - media selection. (15 Hours)

UNIT-5: Advertising budget – methods of advertising budget - advertising agency – Functions – Selection of advertising agency - Evaluation of advertising effectiveness – pre-tests and post-tests - sales promotion: meaning and definition – importance - objectives – advantages -kinds of sales promotion. (15 Hours)

TEXT BOOK:

1. Marketing Management –Dr. C.B. Gupta and Dr.N.Rajan Nair.
   Sultan Chand Ltd., New Delhi

REFRENCE:

1. Marketing management- Philip Kotler
2. Fundamentals of Marketing –William J.Stanton.
3. Marketing Management – R.S.N. Pillai and Bhagawathi

COMPUTER APPLICATIONS IN BUSINESS

Contact Hours per week: 5   **Subject Code: U1BAC43**
Contact Hours per semester: 75   **Credits: 4**
Objectives:

1) To impart the basic knowledge of PowerPoint presentation.
2) To introduce ACCESS and RDBMS concepts.
3) To impart the basic knowledge about Internet.
4) To inculcate the knowledge of Electronic Commerce.
5) To develop the knowledge of Electronic payment systems and EDI.

Unit – I: MS ACCESS : Introduction to Access and database – Database objects – creating database - creating Tables : creating a table using data sheet, design view and table wizard – data types – Primary key - Entering and modifying data in a Table – Creating forms : creating Auto forms – creating forms using design view and form wizard – Entering and editing records in forms – Creating queries : Types of queries – Creating queries using query wizard – creating reports : creating auto reports – Creating reports using Report wizard.   (15 Hours)

Unit – II : Hyper Text Mark-up Language (HTML) – Introduction – HTML Basic tags – Formatting tags – Form control tags – Marquees - setting images and background – Creating Tables – Setting hyperlinks – working with frames.   (15 Hours)

Unit – III: Introduction to Internet – History of Internet – Uses and advantages of Internet – Connection to Internet – WWW – Web pages – Web sites - Modem : Normal modem and ISDN, ADSL, Cable Modems – ISP – Internet Explore – Netscape – Frames – E-mail and voicemail – sending   E-mail, receiving and replying E-mail.   (15 Hours)

Unit – IV: E-Commerce : Introduction, definition – Conceptual frame work of E-Commerce – Nature and scope of E-Commerce – Benefits and limitations – Driving forces of E-Commerce – Strategy and implementation – Strategic planning for E-Commerce – E-Commerce Models – Consumer oriented applications – mercantile process model-The merchants model from the consumer's perspectives – mercantile models from the merchant's perspective.   (15 Hours)

Unit – V: Electronic Payment systems: Types – electronic payment and protocols – Electronic credit card system on the Internet – Electronic fund transfer – Smart cards and debit cards on the Internet – Stored value cards and E-Cash – Security schemes in electronic payment systems. Electronic Data Interchange – EDI applications in business – EDI: Legal, security, and privacy issues – EDI software implementation – Value Added Networks (VANs).   (15 Hours)

Text Books:

1. Computer Application in Business : S.V.Srinivasa Vallabhan, Sulthan
   Chand & Son's, New Delhi.

2. E-Commerce a Manger's Guide: Vasu Deva, Commonwealth
   Publishers, New Delhi.

Reference Books:

1. MICROSOFT OFFICE: Ginicourter and Annette Marquies. BPB
   Publications, New Delhi.
2. Frontiers of Electronic Commerce: Ravikala Kota and Andrew Whiston.

ENTREPRENEURSHIP

Contact Hours per week: 6   **Subject Code: U1BAE41**
Contact Hours per semester: 90   **Credits: 5**
Objectives:
   1) To enable the students to secure a basic general knowledge in business law.
   2) To understand the impact of various business laws on business.
   3) To develop skills so as to apply the law of business to various practical situations
   4) To acquaint themselves with latest developments in the field of business law.

UNIT-I: Entrepreneur – Meaning, Characteristics Functions, and Types. Entrepreneur Vs. Manager. Entrepreneur Vs. Intrapreneur. Entrepreneurship – Meaning – Factors Stimulating Entrepreneurship – Role of Entrepreneurship in Economic Development.   (18 Hours)

UNIT-II: Entrepreneurship Development Programmes – Meaning, Objectives, Courses contents and Curriculum – Phases – Problems in EDP, Women Entrepreneurs – Types - Their Problems and Remedies.   (18 Hours)

UNIT-III: SSIs – Meaning – Importance and Problems of starting an SSI – Steps - Rural Entrepreneurship – Need, How to develop, Problems of Rural Entrepreneurship - Role of NGOs.
                                                                                    (18 Hours)

UNIT-IV: Project Identification – Meaning and Steps, Project Classification – Project Life Cycle. Project Report – Contents. Project Appraisal – Meaning – Feasibility Analysis: Market, Technical, Financial, Economic, Managerial and Social.   (18 Hours)

UNIT-V: Institutional Support : SIDO, SISI, NSIC, SIDCO, DIC-Their Functions – SIDBI's Schemes. Incentives : Subsidy, Tax concessions, Marketing and Export Assistance. Sickness – Definition, Symptoms, Causes. Measures to Prevent sickness in small units.   (18 Hours)

Text Book:
1. Entrepreneurial Development, S.S. Khanka, S. Chand & Co, New Delhi

Books for Reference:
1. Gordon, E & Natarajan, K, 2033, Entrepreneurship Development, Himalaya Publishing House
2. Small Scale Industries and Economics Development, C.S.V. Moorthy, HPH
3. Entrepreneurial Development, Gupta, C.B. and Srinivasan, N.P.Sultan & Sons.

BUSINESS MATHEMATICS

Contact Hours per week: 6   **Sub Code:** U1MAA4B
Contact Hours per semester: 90   **Credits: 5**
OBJECTIVE:

To provide computational skills on sets, indices, differential calculus, integral calculus and matrices and to apply them in solving business problems.

UNIT – 1   **(18-hours)**

Theory of sets: Definition – Finite and infinite sets – description of sets – singleton set – null set – subset – equality of sets – disjoint sets – Set operations: Union of sets – intersection of sets – difference of sets – complement of a set – venn diagram – law of sets: cumulative law - associate law – distributive law – demorgan's laws (properties excluded) – number of elements in a set

UNIT – 2   **(18-hours)**

Indices: laws of indices (proof excluded) – negative index – zero and unity index – fractional index –Simple interest – compound interest calculations.

UNIT – 3   **(18-hours)**

Differential calculus: differentiation – derivative of x^n, e^x, $\log e^x$, $\sin x$, $\cos x$, $\tan x$, $\cot x$, $\sec x$, $\csc x$, a constant, ku, where k is a constant and u is a function (formulae only) – derivative of sum of two functions – product rule – quotient rule (formula only) – maxima and minima: definition – criteria for maxima and minima – working rule.

UNIT – 4   **(18-hours)**

Integral calculus – standard results – integrals of function containing linear function of x (formula only) – (standard results of sin x, cos x, etc excluded) – integration by substitution.

UNIT – 5   **(18-hours)**

Matrices: Definition – order – types (Skew symmetric excluded) – operations on matrix: addition, subtraction – product of two matrices.

Determinant of a matrix: definition – expansion of a determinant – (minors and cofactors – singular – non-singular – properties of determinants excluded) – inverse of matrix – simultaneous linear equations.

BOOKS RECOMMENDED

1. Sancheti and Kapoor - Business mathematics
2. Dr. M.Manoharan, Dr. C.Elango, Prof. K.L.Eswaran - Business Mathematics –.
3. V.Sundaresan & Jeya seelon - Business mathematics
4. P.R.Vittal - Business mathematics
5. R.S. Soni - Essential business mathematics & business statistics
6. A.P. Verma - Business mathematics
7. N.G. Das - Business mathematics and statistics
8. N.K.Nag - Business mathematics

Question paper should provide 80% credit to problems and 20% credit to theory.

WEB DESIGNING LAB

Contact Hours per week: 2   **Sub Code: U1BAS4P1**
Contact Hours per semester: 30   **Credits: 2**

HTML   (15 Hours)
1) Working with basic HTML with tags
2) Working with Graphics
3) Creating Tables
4) Creating Forms
5) Creating Menus, Radio Buttons, Check Boxes and Text Boxes
6) Working with Frames
7) Nesting Frame sets
8) Working with Marques
9) Creating Hyperlinks

MS-ACCESS (15 Hours)
1) Creating Database
2) Creating Tables
3) Creating Queries
4) Creating Forms
5) Creating Reports

Course Name   : **Master of Business Administration**

SEMESTER III

Sl. No	Part	Course Title	Credits	Hours	Marks			Subject Code	Revision
					I	E			
1	Core XII	Operations Research	4	5	25	75	Revised	Revised	Revised
2	Core XIII	International Business	4	5	25	75	New	New	New
3	Core XIV	Research Methodology	4	5	25	75	Revised	Revised	Revised
4	Elective 1	Major Elective 1	3	3	25	75			
5	Elective 2	Major Elective 2	3	3	25	75			
6	Elective 3	Minor Elective 1	3	3	25	75			
7	Core XV-Workshop 3	Workshop on Employability Skills	1	2	40	60	New	New	New
8	Training	Summer Internship Training &Viva Voce	1	4	50	50	New	New	New

SEMESTER IV

Sl. No	Part	Course Title	Credits	Hours	Marks			Subject Code	Revision
					I	E			
1	Core XVI	Business Environment	4	5	25	75	New	New	New
2	Core XVII	Strategic Management	4	5	25	75	Revised	Revised	Revised
3	Elective 4	Major Elective 3	3	5	25	75			
4	Elective 5	Major Elective 4	3	5	25	75			
5	Elective 6	Minor Elective 2	3	5	25	75			
6	Project	Project &Viva Voce	4	5	100	100	No Change	No Change	No Change

ELECTIVES GROUPS
FINANCE ELECTIVES (EF)

Sl.No	Semester	Course Code	Course Title	Revision
1	3	P1MSE31F	Project Management	New
2	3	P1MSE32F	Indian Capital Market	No Change
3	3	P1MSE33F	Management of Financial Services	New
4	4	P1MSE41F	Banking Services Operations	New
5	4	P1MSE42F	Income Tax	New
6	4	P1MSE43F	Security Analysis	New
7	4	P1MSE44F	LAB: Financial Accounting with Tally	New

MARKETING ELECTIVES (EM)

Sl.No	Semester	Course Code	Course Title	Revision
1	3	P1MSE31M	Consumer Behavior	No Change
2	3	P1MSE32M	Product Management	Revised
3	3	P1MSE33M	Integrated Marketing Communication	New
4	4	P1MSE41M	Services Marketing	No Change
5	4	P1MSE42M	Retail Management	New
6	4	P1MSE43M	Brand Management	New

HUMAN RESOURCESS ELECTIVES (EH)

Sl. No	Semester	Course Code	Course Title	Revision
1	3	P1MSE31H	Human Resources Development	New
2	3	P1MSE32H	Industrial Relations	New
3	3	P1MSE33H	Training & Development	Revised
4	4	P1MSE41H	Strategic Human Resources Management	New
5	4	P1MSE42H	Executive Development	New
6	4	P1MSE43H	Performance Management	New

SYSTEMS ELECTIVES (ES)

Sl. No	Semester	Course Code	Course Title	Revision
1	3	P1MSE31S	Software Project Management	No Change
2	3	P1MSE32S	RDBMS/ Client Server Computing (ORACLE)	New
3	3	P1MSE33S	Enterprise Resource planning	New
4	4	P1MSE41S	Data Mining and Data Warehousing	New
5	4	P1MSE42S	Network Management & Information Security	New
6	4	P1MSE43S	Web page Designing using PHP & My SQL	New

OPERATIONS ELECTIVES (EO)

Sl. No	Semester	Course Code	Course Title	Revision
1	3	P1MSE31R	Purchase and Materials Management	New
2	3	P1MSE32R	Supply Chain Management	New
3	3	P1MSE33R	Total Quality Management	No Change
4	4	P1MSE41R	World class Manufacturing system	New
5	4	P1MSE42R	Business Process Management	New
6	4	P1MSE43R	Production Design Analysis and Production system	New

Subject code: P1MSC31	SEMESTER III	Total Contact hours: 60 hrs
Credits : 4	OPERATIONS RESEARCH	Contact hours per week: 5 hrs

OBJECTIVES
- To identify and define problems pertaining to business situations
- To quantify the problem parameters and translate them into suitable mathematical models,
- To use computer packages to solve the models

UNIT I   **12 Hours**

LINEAR PROGRAMMING:

Linear programming- Essentials of Linear Programming Model- Formulation of Linear Programming- Solving LPP using Graphical Method- Solving LPP using Simplex method

UNIT II   **12 Hours**

LINEAR PROGRAMMING AND INTEGER PROGRAMMING:

Linear programming- Duality and its economic interpretation, Inter programming – Enumeration method, and branch and bound algorithm

UNIT III 12 Hours

TRANSPORTATION & ASSIGNMENT MODELS:

        Transportation Model - Initial solution using North West Corner, Least Cost and Vogel's Approximation methods Balanced and Un-balanced Transportation problem- Maximization and Prohibited Routes problem - Optimal solution using Modified Distribution method (Only Non Degenerative Models)

Assignment Problems-Balanced, Un-balanced and Restricted problems- Hungarian Method of solving assignment problem- Traveling Salesman problem

UNIT IV 12 Hours

SIMULATION, QUEUING & GAME THEORY:

        Introduction, Steps Involved, Advantages & Disadvantages, Monte Carlo Simulation, and Application to Business. Queuing models – Problems involving Single Channel waiting model with Poisson arrivals and exponential service times Game Theory – Pure and Mixed Strategies, Dominance principles, and application to business.

UNIT V 12 Hours

SEQUENCING AND NETWORK MODELS

        Sequencing- Sequencing of 'n' jobs and '2' machines, 'n' jobs and '3' Machines, 'n' jobs and 'm' machines. Network models – PERT (Project Evaluation and Review Technique), CPM (critical path method)

Provide Tutorial in TORA for Unit I, III, IV & V .

Text Books:

1. HamdyA.Taha, Operations Research – An Introduction, Seventh Edition, , Prentice Hall of India Learning private Limited.
    a. UNIT I – Chapter 2, 3
    b. UNIT II - Chapter 7, 9
    c. UNIT III - Chapter 5

2. ND Vohra., Quantitative Techniques in Management, IV edition Tata McgrawHill
    a. UNIT IV - Chapter 13, 15, 16
    b. UNIT V – Chapter 8 and 12

References

1. Nita H.Shah., RaviM.Gor, HardikSoni. Operations Research, Fourth Edition, Prentice Hall of India Learning private limited.

2. Sharma.J.K., Operations Research, Macmillan India Ltd.

3. R.Panneerselvam., Operations Research, PHI 2007.

Placed at the Academic Council Meeting held on 23.03.2013   Annexure I   M.B.A.

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Subject code: P1MSC32	SEMESTER III	Total Contact hours: 60 hrs
Credits : 4	INTERNATIONAL BUSINESS	Contact hours per week: 5 hrs

OBJECTIVE

It is intended to equip future business leaders with the **subject knowledge** and the **methodological, interpersonal** and **intercultural skills** that will enable them to perform effectively and responsibly in a diverse environment.

UNIT I 12 Hours

International Business – An Overview and Business Environment:

Globalization – Growing relevance – International orientations – Drivers and restrainers – Business decisions – Types of International Business.

Environment of International Business and its significance – Economic, Socio/Cultural, Demographic, Political, Regulatory, Natural, Technological Environment – Religion, Language, Culture and Organizational Behaviour – Transfer of technology

International Trading Environment – Trade strategies – Arguments for Free trade – Methods of Protection – Commodity agreements – Cartels – Trade Blocks – Forms of Integration – Free Trade Agreements

Unit Case Analysis

UNIT II 12 Hours

International Monetary System and Investment:

The Brettonwoods system – EMS,ECU and Euro – Foreign Exchange market – Exchange Control – Exchange rate, systems, classifications and convertibility – Devaluation – FEMA.

International Investment and Finance – Theories of International Investments – Significance and Types of Foreign Investment – FDI and production linkages – Trade and Investment – Factors affecting International Investment – Growth , Dispersion and Limitations FDI – Cross border M&As – Portfolio Investments – Foreign investment in India – Foreign Investment by Indian companies

Unit Case Analysis

UNIT III 12 Hours

Globalization & International Goods, Services and Financial Flows:

Globalization – Definitional Dimensions – Globalization of World Economy – Essential conditions for Globalization – Advantages – Implications and Impact – Policy options

International Business Flow – Balance of trade and Balance of Payments – Balance of Payments – Meaning , Disequilibrium, Correction, Financing Deficit – Global Trade, Merchandise trade, Countertrade, Trade in services - Global trade in Developing countries, South-South Trade, Triangular trade – Global sourcing

UNIT IV 12 Hours

Market Selection and Entry Strategies:

Market selection process – Determinants – Evaluation matrix – Market profile - Market segment selection

Market entry strategies – Exporting – Licensing and Franchising – Contract manufacturing – Management contracting – Turnkey contracts – Fully owned manufacturing facilities – Assembly operations – Joint ventures – Third country location – Mergers and acquisitions – Strategic Alliance

Social issues – Business ethics – Social responsibility of business – Responsibilities of different sections – Environmental issues – Labour issues

Unit Case Analysis

UNIT V   **12 Hours**

India in the Global setting:

India in International business – Highlights of Merchandise trade – Determinants of Exports/Imports – Major Exports/Imports – Direction of trade - Trade in Services – Balance of Payments – Major problems of India's export sector

India an emerging market - India in global trade – Liberalisation and Integration with the Global economy

Globalisation of Indian Business – Obstacles to Globalisation – Factors favouring globalisation – Globalisation strategies

Unit Case Analysis

Text Book:

1. Francis Cherunilam, International Business – Text and Cases, Fourth Edition-Revised – PHI Learning Private Limited, New Delhi.
    a. UNIT I   - Chapter 1, 3,4
    b. UNIT II   - Chapter 6,9
    c. UNIT III - Chapter 11,12
    d. UNIT IV - Chapter 14,15,22
    e. UNIT V - Chapter 25,26,27

Reference Book:

1. Charles W L Hill and Arun Kumar Jain, International Business – Competing in the Global Marketplace, Sixth Edition. Tata McGraw-Hill Publishing Company Limited.

Subject code: P1MSC33	SEMESTER III	Total Contact hours: 60 hrs
Credits : 4	RESEARCH METHODOLOGY	Contact hours per week: 5 hrs

OBJECTIVE:

To make conversant the students with the basic knowledge in the concepts, methodology, techniques and report writing in varied arenas of business research.

UNIT –I   **12 Hours**

Research meaning – Purpose – Types of research – Significance of research in social and business sciences – Steps in research – Identification, selection and formulation of research problem – Research process – Criteria of good research – Research design – Formulation and testing of hypothesis.

UNIT – II   **12 Hours**

Sources of data – Collection of primary data – Observation method – Interview method - Collection of data through questionnaires, schedules, some other methods of data collection – Case study data, limitations and cautions.

UNIT – III   **12 Hours**

Sampling techniques – Sampling theory – Types of sampling – Steps in sampling – Sampling size - Advantages and limitations of sampling. ,Types of sample design.

UNIT – IV   **12 Hours**

Data processing ; Checking – Editing – Coding – Transcription and Tabulation Data analysis – Meaning and methods – Documentation, scaling techniques – Measurement of scales – Need for measurement - difficulties in measurement – Types of scales – Scale construction techniques.

UNIT – V   **12 Hours**

Research report – Types of reports – contents – Steps in writing report – Editing the final draft – Evaluation the final draft – layout of the research report.

Text Book:

1. C. R. Kothari "Research Methodology Methods and Techniques" – New Age
   International (P) Ltd, Publishers, Second Revised Edition
   UNIT I   - Chapter 1, 2,3
   UNIT II   - Chapter 6
   UNIT III - Chapter 8
   UNIT IV - Chapter 5
   UNIT V - Chapter 14

Reference Books:

1. Harper W. Boyd, Jr, Ralph Westfall, Stanley F. Stasch – "Marketing Research – Text & Cases" - A.I.T.B.S. Publishers & Distributors, New Delhi, Seventh Edition

Subject code: P1MSE31F	**SEMESTER III**	**Total Contact hours: 45 hrs**
Credits : 3	**PROJECT MANAGEMENT**	**Contact hours per week: 3 hrs**

Objectives:

This Course imparts knowledge in detail regarding a new project proposal, like idea generation, market Analysis, Demand Analysis and Risk analysis to make our project planning more efficient.

Unit – I   **9 Hours**

Capital Investment- Importance, Difficulties, Types, Phases of Capital Budgeting Process, Facets of Project Analysis, Key issues in Project Analysis, Schematic Diagram of Feasibility study.

Unit-II   **9 Hours**

Generation and Screening of Project ideas: Generation of ideas, monitoring the Environment, Corporate appraisal, Scouting of project ideas, Preliminary screening, Project rating index

Unit –III   **9 Hours**

Market and Demand Analysis: Key steps in Market and Demand Analysis and their interrelationship. Characterization of the Market. Demand Forecasting Methods: Delphi method, Trend Projection Method, Exponential Smoothing Method, Moving Average Method, Chain Ratio Method, Consumption Level Method, End use Method.

Uncertainties in demand forecasting, Environment Charge, Market Planning, Technical Analysis.

**Unit- IV**   **9 Hours**

Risk Analysis of Investments: Source of risk, Measures of risk, Perspectives of risk. Sensitivity Analysis, Scenario Analysis, Best & Worst Case Analysis, Break Even Analysis, Hillier Model, Simulation Analysis, Decision Tree Analysis, Project Selection under risk.

Unit-V   **9 Hours**

Net work Techniques for Project Management: Development of Project Network- Time Estimation- Determination of Critical Path Method- Scheduling when resources are limited- PERT Model, CPM Model- Network cost system

Text book:

Parsanna Chandra- Projects- Planning, Analysis, Financing, implementation and Review – 5th Edition, Tata Mc Graw Hill

Unit I	- Chapter 1
Unit II	- Chapter 3
Unit III	- Chapter 4&5
Unit IV	- chapter 11
Unit V	- Chapter 22

Reference Books:

1. V.C. Sontakki   Project Management   Himalaya publishing House 2009

Subject code: P1MSE32F	SEMESTER III	Total Contact hours: 45 hrs
Credits : 3	INDIAN CAPITAL MARKET	Contact hours per week: 3 hrs

Objectives:

This course gives unique Knowledge in the field of Capital Markets. It gives an insight in to the avenues, operation and management of various capital market segments.

Unit I   **9 Hours**

Introduction – what is Securities Market?- What are Securities?- Mobilization of savings for investment – IOUs as Securities- Characteristics of securities- Schematic Presentation of emergence of Market – Savings and Investments- Objectives of Investors – Investment and Speculation- Classification of Investments – Tax Provision - Objectives of investor – characteristics of Investment - Risk- Return Relationships- Tax Benefits – marketability and Liquidity- Safety vs. Riskiness - Classes of Instruments – Investment Profile of Average Household- Analysis of Household sector Savings – Non – Corporate Investments – corporate Investments – Various Investment Avenues - Taxation of Dividend and Interest Income- Brokerage Income and Business Profits – Tax Treatment on Investments - Interest and Dividend : Section 80 L, Tax Rebate under Section 88 – Capital Gains Taxation –Postal Investments- Traction Costs.

Unit II   **9 Hours**

Floatation: Definition – Functions- Methods of floatation – Offer Through Prospectus- Offer of sale- Private placement- Right Issue – debt versus Equity – Rights of Conversion of debt into Equity- Preference Shares- Bonus Shares – Cost of Floatation – Under writing Activity- Abuses in the New Issue Market- problems of the New Issue Market – Primary Market – problems – public Response – Timing of New Issues- Cost of Capital issues – Wasteful Procedures on Public Issue. Introduction- Objectives –SEBI Guidelines- reforms in the New Issues Market- details of SEBI Guidelines – For capital Market- SEBI Reforms on stock Exchanges- Complaints against Members – grievances Cell- Customers' Protection Fund. Investors Beware- Objectives – coverage. Recognized Stock Exchanges- regulation of Trading. Credit Rating- Confidentiality of Information – CRISIL – ICRA- CARE – Duff and Phelps.

Unit III   9 Hours

 History of Stock Exchanges- What is a Stock Exchange?- Byelaws – Regulation of Stock Exchanges- recognition by Government – Licensed Dealers – securities Contracts (Regulation) rules, 1957 – Present Recognized Stock Exchanges- Qualifications for Membership – organization – demutualization of Stock Exchanges – advantages of demutualization – Disadvantages – Governing Body? Functions of Stock Exchanges – listed, paidup Capital – Who Owns the Securities? – Bombay. Stock Exchange :– Patel Committee- regulations on Trading- Investor Protection – Measures to promote healthy stock Markets – other reforms – rolling Settlement System. CDSL- central depository Services Limited- Globalization of Stock Exchanges – DEMAT Form of Trading – Electronic Form of Trading – Internet trading (e-trading) - Foreign Listing.

Unit – IV   9 Hours

Securities Exchanges – Structured markets – OTC - New Issues Market –Advantages of OTC – Role of OTC – Over- the- Counter Exchange of India (OTCEI) – objectives of OTCEI- Establishment of OTC-Listing on OTCEI- Investors Benefited – Market Players- Listing Procedure – Trading on the OTCEI – Problems-OTCEI. National Stock Exchange- National Market System- Characteristics – NSE operations- Automated Lending and Borrowing Mechanism (ALBM) – Central Depository System- listing of Securities – Settlement system – the national Securities Depository Limited (NSDL)- What is a depository?- Dematerialization- Advantages of the Depository – About the Depository Participants. Interconnected Stock Exchange – objectives – computer System – Trader Work Stations- Advantages of ISE.

Unit – V   9 Hours

Introduction- Specified and Non –Specified Groups – Customer's Orders – Trading Ring- Block Book (or the Sauda Book) – Contract Note – Drawing Up and Bills – Cum and Ex- dividend- Settlement in Specified List – Badla Charges – Factors Influencing Badla rates- Carry Forward Facilities – Book Closure Badla Financing (BCBF) – Settlement in Non- Specified Shares – After the Badla Day. Kinds of Delivery – Hand Delivery – Spot Delivery – Special Delivery- delivery for Clearing.
Pattern of Trading – 'Z' Group in Bombay Stock Exchange- Trading and Settlement - Speculative traders vs. Genuine Investors- Types of Speculators- Activities of Brokers – Brokers, Charges- Delivery / Payment – Settlement Procedure – Auctions – Clearing Procedure- regulation- National Clearance and depository System- Present Settlement and Clearance System – National trade Comparison and Reporting System- Internet Broking – Order Routing System (ORS) – e- Broking

Text Book:
V.A.Avadhani, Investment Management, Himalaya Publishing House, 7th Ed

Unit I	- Chapter 1, 2
Unit II	- Chapter 5, 6, 7
Unit III	- Chapter 16
Unit IV	- Chapter 17
Unit V	- Chapter 18, 19

Reference Books

1.	William F. Sharpe	Investments	PHI Learning Private Ltd	1995
2.	Herbert B.Mayo	Investments	Thomson South- Western	2006
3.	ZVI Bodie	Investments	Tata Mc Graw Hill Pub	2006

Subject Code : P1MSE33F	SEMESTER III	Contact Hours Per semester : 45 hrs
Credits : 3	MANAGEMENT OF FINANCIAL SERVICES	Contact Hours Per Week : 3 hrs

OBJECTIVE

To learn about the range of financial services facilitated by the Market players and their impact on the efficiency of the financial system

UNIT I   **9 Hours**

FINANCIAL SYSTEM AND SERVICES – AN OVERVIEW:

Financial System – Features – Constituents – Financial Institutions – Financial Services – Financial Markets – Financial Instruments

Financial Services – Genesis – Concept – Objectives/Functions – Characteristics – Financial Services Market – Concept - Constituents – Growth of Financial services in India – Financial Services Sector – Problems – Regulatory Framework.

UNIT II   **9 Hours**

CREDIT RATING AND ELECTRONIC CARDS:

Credit Rating – Genesis – Impetus – Origin – Definition – Features – Advantages – Growth Factors – Major Issues – Credit Rating Agencies – Regulatory Framework – Symbols – Rating Framework Major Factors – Equity Grading.

Credit cards – Genesis – Origin and History – Features – Facilities and Services – Classification – Innovative Cards – Credit card Cycle – Bank Card associations – Credit Card Structure – Validity and Renewal – Credit cards and E-Commerce – Credit card Frauds – Credit Information Bureau – Benefits and Drawbacks.

Debit Card – Genesis – Concept – Mechanism – Promotion and Progress – Dangers of Debit cards – Liability for Fraud – Consumer Protection – Precautions.

Smart Cards – Concept – Features – Evolution – Types – Security Features – Financial Applications.

UNIT III   **9 Hours**

CAPITAL MARKET SERVICES:

Book-Building – Concept – Characteristics – The Process – Allocation Procedure – Reverse Book-Building.

Public Issue Management – Concept – Functions – Categories – Issue Manager – Marketing and pricing – Public Issue Proposal.

Underwriting of Securities – Definition – Types – Benefits – Functions – Underwriting agents – Obstacles – SEBI Guidelines

Venture Capital – Conceptual Framework – Features – Methods of Evaluation – Criteria for analysing Proposals – Buyouts – Critical factors – Venture capital Funds in India

UNIT IV   **9 Hours**

TRADITIONAL FINANCIAL SSERVICES

Commercial Bill Financing – Definition, Features, Types – Commercial Bill Discounting – Definition, Features, Advantages – Bill Systems

Consumer finance – Definition Types, Sources, Demand, Products, Terms, Pricing and Marketing – Consumer Credit Scoring – Instalment Credit System

Hire Purchase System – Advantages, Disadvantages, Cost – Hire Purchase finance – Definition – Rights and rates – Leasing Vs Hire Purchase Financing

Leasing – Definition, Characteristics, Types, Participants, Process, Advantages, Limitations – Tax aspects – Financial Implications

Placed at the Academic Council Meeting held on 23.03.2013   Annexure I   M.B.A.

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UNIT V   **9 Hours**
EMERGING FINANCIAL SERVICES

Insurance Services – Basic Principles – Reinsurance, Life, general, Fire, Marine Insurance – Important Players in India and Abroad – Regulatory framework – Insurance and Regulatory Development Authority

Mutual Funds – Definition, Products, Schemes – Asset management Company – Functions and working Mechanism – Evaluating Mutual Funds – Regulatory structure of Mutual Funds – Association of Mutual Fund Industry

Securitization – Features and need – Pass through certificates – Special Purpose Vehicle – Economic Functions – Benefits and Limitations

Infrastructure financing – Sectors – Financial Options – Financing Instruments – RBI Guidelines – Recent Developments

Text Book:
S.Gurusamy, Financial Services and Systems – Tata McGraw Hill Limited second edition
      UNIT I   - Chapter 1, 7
      UNIT II   - Chapter 9,10,11,12
      UNIT III   - Chapter 8, 24,27,28,30
      UNIT IV   - Chapter 13,14,15,18
      UNIT V   – Chapter 16,23,25,31

Reference Book:
L.M.Bhole – Financial Institutions and Markets – Tata McGraw Hill Publication Co.Ltd, Fourth edition

Subject code: P1MSE31M	SEMESTER III	Total Contact hours: 45 hrs
Credits : 3	CONSUMER BEHAVIOUR	Contact hours per week: 3 hrs

Objective:

The Objective of the course is to explore and evaluate the extensive body of both published and unpublished research evidence and to assess the practice implication of the various process and facts of consumer motivation and behavior.

UNIT-I: Introduction: The Impact of the Digital Revolution on Consumer Behavior
        9 Hours

Definition and Scope - Development of the Marketing Concept and the Discipline of Consumer Behavior -Implementing the Marketing Concept- The Role of Consumer Research –Segmentation , Targeting , and Positioning – Customer Value, Satisfaction, Retention- Customer Value- Customer Satisfaction –Customer Retention- Marketing Ethics and Social Responsibility-Consumer Behavior and Decision Making

UNIT-II: Consumer Motivation   **9 Hours**

Motivation as a Psychological Force- Needs – Goals - Positive and Negative Motivation- Rational Versus- Emotional Motives- The Dynamics of Motivation - Success and Failure Influence Goals- Substitute Goals- Frustration - Multiplicity of Needs- Arousal of Motives - Types and Systems of Needs- Hierarchy of Needs- Segmentation and Promotional Applications – Positioning Applications .

UNIT-III: Personality and Consumer Behavior   9 Hours

Personality – Nature, Theories - Freudian Theory - Neo Freudian Theory- Trait Theory- Personality and Understanding consumer Diversity- Consumer Innovativeness and Related Personality Traits- Cognitive Personality Factors- Consumer Materialism to Compulsive Consumption- Consumer Ethocentrism:Responses to Foreign Made Products- Brand Personality: Brand Personification- Product Personality and Gender-Product Personality and Geography- Personality and Color –Self and self-Image- One or Multiple Selves –The Makeup of the self-Image-The Extended self-Altering the Self

UNIT-IV: Reference Groups and Family Influences   9 Hours

Group - Understanding the Power of Reference Groups - Factors That Affect Reference Group - Selected Consumer Related Reference Groups- Friendship Groups-Shopping Groups-Work Groups- Virtual Groups or Communities- Consumer Action Groups - Celebrity and Other Reference Group Appeals-Celebrities-The Expert- The executive and employee Spokesperson-Trade or Spokes- Characters- Other Reference Group Appeals-Socialization of Family Members- Consumer Socialization of Children-Adult consumer Socialization –Intergenerational Socialization.

UNIT-V: The Influence of Culture on Consumer Behavior: 9 Hours

Culture- the Invisible Hand of Culture- Culture satisfies Needs - Culture Is Learned-Enculturation and Acculturation-Language and Symbols –Ritual- Culture Is Shared-Culture Is Dynamic-The Measurement of Culture-Content Analysis-Consumer Fieldwork- Value Measurement Survey Instruments- Subcultures and Consumer Behavior- Subculture–Nationality Subcultures-Hispanic Subcultures-Religious Subcultures-Geographic and Regional Subcultures-Racial Subcultures -Age Subcultures - Age Subcultures - The Generation Y Market-The Generation X Market- The Baby Boomer Market- Older Consumer.

Text Book

Leon G.Schiffman, Leslie Lazar Kanuk- Consumer Behaviour - 8th edition.
Unit I – Text Book – Chapters 1
Unit II – Text Book – chapter 4
Unit III – Text Book – chapters 5
Unit IV – Text Book – chapters 10
Unit-V Text Book – chapters 12, 13

Reference Book:

Suja R.Nair "Consumer Behaviuor in Indian Perspective - Text and Cases" Himalaya Publishing House 2nd edition.

Subject code: P1MSE32M	SEMESTER III	Total Contact hours: 45 hrs
Credits : 3	PRODUCT MANAGEMENT	Contact hours per week: 3 hrs

Objective:

Product Management is the part of Marketing management which deals with the role of products in marketing strategy and marketing mix. It is planning, organizing, directing, and controlling of products centered activities within the marketing management of a company. The most prominent tasks of product Management are constant evaluation of phasing of old product as well as enhancing the evaluation of new products.

Unit I   **9 Hours**

Business objectives and product demand and product planning- product life cycle- Different stages of marketing mixes during PLC.

Unit II   **9 Hours**

Developing product plans-product policy-product position to other elements of the related planning to other elements of the marketing mix, physical distribution and promotion.

Unit III   **9 Hours**

Product modification- Product elimination- Product appraisal systems

Unit IV   **9 Hours**

New product management-Nature and importance of organization for new product, planning and development- the product planning and development process- explorations- search for new product ideas- Business analysis product development- product testing- market testing- commercialization- follow up requirements- effective management of new product planning and development.

Unit V   **9 Hours**

Brand Strategies- Design and implementation of brand strategies- Global Branding- Global brands- Global brand planning system- Global brand leadership- Global cross country synergy

Text Book:

U.C. Mathur, Brand Management Text & Cases, Macmillan, 2006

Unit I – Text Book – Chapters 1

Unit II – Text Book – chapter 3

Unit III – Text Book – chapters 4

Unit IV – Text Book – chapters 6, 8

Unit V – Text Book – chapters 8

Reference Book:

Ramanuj Majumdar "Product Management in India" Prentice Hall of India Private Limited 2nd edition.

Placed at the Academic Council Meeting held on 23.03.2013   Annexure I   M.B.A.

945

VIRUDHUNAGAR HINDU NADARS' SENTHIKUMARA NADAR COLLEGE
(An Autonomous Institution Affiliated to Madurai Kamaraj University)
[Re-accredited with 'A' Grade by NAAC]
Virudhunagar – 626 001

Subject code: P1MSE33M	SEMESTER III	Total Contact hours: 45 hrs
Credits : 3	INTEGRATED MARKETING COMMUNICATION	Contact hours per week: 3 hrs

Objective;

The objective is to introduce the students to the integrated role of promotion techniques with the special emphasis on advertising.

Unit – 1   **9 Hours**
The nature of marketing communication – Marketing communication at the brand level. The integration of marketing communications – The value of synergy-Obstacles to implementing IMC.

Unit – II   **9 Hours**
The source and Encoding – Brand messages-Product brand messages-Price Brand messages-Promotion Brand messages-Media channels-Noise-the receiver and Decoding –Feedback and Interactivity.

Unit –III   **9 Hours**
Brand decision making approach to marketing communication-Hierarchy of Effects models-The AIDA sequence-Think /Feel/Do models-How brand decision making works? How MC messages influence on consumer decisions?

Unit-IV   **9 Hours**
The functional areas of marketing communication: Advertising – Direct marketing – Publicity-sales promotion-Personal selling –Packaging. Events and sponsorship –Customer service-Integrated marketing communication-Concept and Process – Integration produces synergy- The benefits of using IMC.

Unit – V   **9 Hours**
On-Off premise signage and point of purchase communications.

Text Books:
1. Principles of Advertising & IMC – Tom Duncan (TATA McGraw Hill) second edition
2. Advertising and Promotion- An IMC Approach – Shimp (South Western) 2011

Unit – 1(Advertising & Promotion – Shrimp)
Unit – II (Chapter 1-Advertising and IMC- Tom Duncan)
Unit –III (Chapter 5-Advertising and IMC- Tom Duncan)
Unit-IV (Chapter 1-Advertising and IMC- Tom Duncan)
Unit – V (Chapter 5-Advertising and IMC- Tom Duncan)

Reference
1. George E. Belch & Michael A. Belch "Advertising and Promotion – An integrated Marketing Communications perspective" Tata Mcgraw Hill, 2008.
2. Joel R.Evans " Marketing"., 8th edition

Subject code: PIMSE31H	Semester III	Total Contact hours : 45 hrs
Credits : 3	**HUMAN RESOURCES DEVELOPMENT**	Contact hours per week: 3 hrs

Objective:

This course aims at providing a conceptual framework on human resource development and practicing against the conceptual framework referred to with respect to enhancing their effectiveness in utilizing human resources.

Unit I   **9 Hours**

Nature & Concept of HRD – Objectives – Principles – Functions - Role & Responsibilities of a HRD manager - HRM and HRD - Challenges of HRD - HRD in India - Emerging Issues for HRD Professionals.

Unit II   **8 Hours**

Training & Development - Definition, Objectives, Identification of Training Needs - Training Process -Types & Methods of Training - Essentials of a Good Training Programme.

Unit III   **10 Hours**

Employee Coaching - Concepts and Definitions, Types, Process, Effective Coaching Techniques, Elements, Principles; Employee Counseling - Definitions, Theoretical Approach to Counseling Process; Mentoring - Characteristics, Dynamics, Role of a Mentor, Mentoring Life Cycle.

Unit IV   **9 Hours**

Career Planning - Nature, Characteristics, Objectives, Benefits; Career Development - Definitions, Principles, Theories, Strategies, Role of HRD in Career Planning and Development - Career Banding.

Unit V   **9 Hours**

Strategic HRD - Concept & Needs, Characteristics, Objectives, Strategic HRD Process, System.

Textbook:
1. HRD Theory & Practice-Tapomoy Deb, Ane Books Pvt Ltd., 2011.
      Unit I – Chapters 1
      Unit II – Chapters 3
      Unit III– Chapters 5
      Unit IV – Chapters 7
      Unit V – Chapters 12

Reference
1. Uday Kumar Haldar, "Human Resource Development" Oxford University Press, 2010, second edition.
2. P.C. Tripathi, "Human Resource Development", Sultan Chand Publication, 2007.

| Subject code: PIMSE32H	Semester III	Total Contact hours : 45 hrs
Credits : 3	**INDUSTRIAL RELATIONS**	Contact hours per week: 3 hrs

Objectives

The objective is to enhance the students understanding of Indian Legal environment relevant to labour legislations. Industrial relation and emphasis on application of various provisions of the relevant laws to various simulated cases.

Unit I   **7 Hours**

Industrial Relations - Meaning, Nature, Approaches, Significance, Conditions for Good Industrial Relations, Causes & Effect of Poor Industrial Relations, Suggestions to Improve Industrial Relations, Industrial Relations in Globalized economy.

Unit II   **10 Hours**

Trade Unions - Definition, Scope, Need, Objectives, Functions, Theories, Methods, Historical Development of Trade Unions in India Trade Union Act 1926, Future Role of Trade Unions in India, International Labour Organization- Objectives, Functions.

Unit III   **10 Hours**

Collective Bargaining - Meaning, Benefits, Structure, Negotiation, Types, Collective Bargaining in India; Industrial disputes - Forms, Participants, Causes & Result of Disputes, Methods for Prevention and Resolution for Industrial Disputes, Strike, Lock out, Lay Off, Retrenchment

Unit IV   **9 Hours**

Workers Participation in Management - Meaning, Objectives, Evolution, Factors, Workers Participation in Management in India, Empowerment - Merits, Requisites for Empowerment.

Unit V   **9 Hours**

Employee Discipline - Meaning, Types, Disciplinary Actions, Grievance Handling

Textbooks:

1. P.C. Tripathi -"Personnel Management & Industrial Relations", Sultan Chand & sons, 29th edition, 2009.
   Unit I – Chapters 21
   Unit II – Chapters 9
   Unit III– Chapters 20, 21
   Unit IV – Chapters 22
   Unit V – Chapters 17, 18

Reference:

1. CS. Venkataraman, "Industrial Relations", Oxford University Press 2006.
2. CB. Mamoria & S.V, Gankar "Dynamics of Industrial Relation", Himalaya Publishing House, 2008.

Subject code: PIMSE33H	Semester III	Total Contact hours : 45 hrs
Credits : 3	**TRAINING AND DEVELOPMENT**	Contact hours per week: 3 hrs

Objective

This course aims training the participants in understanding the training needs, designing, administering and evaluation training and development program in an organization.

Unit I 9 Hours

Training-Objective, Concepts, Scope, Need and Importance, Role of Training in Organization, Structure of Training Organization, Training Process Model.

Unit II 11 Hours

Analysis of Training Needs - Organizational Analysis, Operational Analysis, Person Analysis, Job Analysis, Methods and Techniques of Training Need Assessment, Training Need Assessment and Process.

Training Design - Prime Considerations while Designing a Training Programme, Check List, Budgeting for Training, Identification of Objectives; Facilitation of Learning and Transfer, Training Programme Delivery, Qualities of a Professional Trainee.

Unit III 8 Hours

Training Methods - Lectures and Demonstrations, Computer Based Training, Games and Simulations, On-The-Job Training, Audio Visual Enhancements to Training.

Unit IV 8 Hours

Implementation and Evaluation of Training-Logical and Physical Arrangements, Tips for Trainer for Effective Implementation; Evaluation-Definition, Need, Types of Instruments, Evaluation Design Issues.

Unit V 9 Hours

Management Development - Need, Importance, Approaches, Sources of Knowledge and Skills, Special Needs of Technical Managers, Strategies to Develop Technical Managers, Training for Executive Level Management.

Text books:
1. Blanchard, P Nick, James W Thacker, "Effective Training systems, strategies and practices" Pearson Education, New Delhi 2006, second edition.
2. R.K Sahu, "Training for development", Excel Books, 2006.

    Unit I – Chapters 1, 2 (R.K Sahu) 1 - (Blanchard, P Nick, James W Thacker)
    Unit II – Chapters 8, 10, 11 (R.K Sahu) 4, 5 - (Blanchard, P Nick, James W Thacker)
    Unit III– Chapters 12, 13 (R.K Sahu) 6 - (Blanchard, P Nick, James W Thacker)
    Unit IV – Chapters 7, 8 (Blanchard, P Nick, James W Thacker)
    Unit V – Chapters 10 (Blanchard, P Nick, James W Thacker)

Reference:
1. Rolf Plynton and Udai Pareek, Training for Development, Vistaar Publications, 2007.
2. Irwin.L.Goldstein, Training in Organisations, Thomson, 2007.

Subject code: P1MSE31S	SEMESTER III	Total Contact hours: 45 hrs
Credits : 3	SOFTWARE PROJECT MANAGEMENT	Contact hours per week: 3 hrs

Objectives:

This course covers the features, methodology, processes which are implemented in creating the software.

UNIT-1:   **7   hours**

Introduction: Introduction to Software Project management – overview of project planning (step wise project planning) – programme management and project evaluation

UNIT-2:   **12 hours**
Selection of an appropriate project approach – introduction – choosing technologies – technical plan contents list – choice of process models - Waterfall Model, Prototyping Model, the RAD Model, Evolutionary Software Process Model (the Incremental Model), Spiral Model, Concurrent Development Model, selecting the most appropriate process model

Software effort estimation: : Importance , Basic Principles, Cost Estimating (Types), Techniques and Tools, Problems with Cost Estimates, Cost Control, Earned Value Management.

Estimation Techniques : - COCOMO (Basic, Intermediate & complete COCOMO Model) - Halstead's Software Science - Putnam Model - Jensen Model

UNIT-3:   **8 hours**
Activity planning – introduction – objectivities – when to plan – project schedules- projects and activities – network planning models – formulating network model – adding the time dimension – forward and backward pass - Risk management – introduction – categories – risk identification –risk assessment – risk planning

UNIT-4:   **9 hours**
Resource allocation- Importance – identifying resource requirements – scheduling resources – critical paths – counting the cost – publishing resource schedule – cost schedule – scheduling sequence - **Monitoring control** – introduction – framework – collecting the data- visualizing the progress- cost monitoring – earned value analysis, prioritizing monitoring – getting project back – change control

UNIT-5:   **9 hours**
Managing people and organizing terms and quality

Quality Management : Quality Planning, Assurance & Control, Leadership - Cost of Quality, Organizational Influences, Work Place factors & Quality, Maturity Models.

Project Human Resource Management : Managing People (Motivation Theories, Influences & power, Improving Effectiveness), Organizational Planning, Staff Acquisition & Term Development.

Text Book:

1. Bob Hughes Mike Cotterell – Software Project Management - Fourth Edition - Tata Mcgraw Hill

        UNIT I: – Chapters 1, 2, 3

UNIT II: – Chapters 4, 5
UNIT III: – Chapters 6, 7
UNIT IV: – Chapters 8, 9
UNIT V: – Chapters 11, 12

Reference:
1. Basic of Software Project Management : Niit - PHI
2. P Gopalkrishnan & V E Ramamoorthy : Text Book of Project Management, McMillan Indian Limited, New Delhi, 1993.

Subject code: P1MSE32S	SEMESTER III	Total Contact hours: 45 hrs
Credits : 3	RDBMS / CLIENT SERVER COMPUTING (ORACLE)	Contact hours per week: 3 hrs

Objectives:

This course covers the relational database concepts which are essential in working with back end.

UNIT-1:

Introduction   **8 hours**

Introduction – Purpose of DB system – Overall System Structure – Data Models – Why more Data models? - Types of Data Models – E-R Model: Entities & Entity sets- Relationships – Mapping constraints – Primary Keys – E-R Diagrams

UNIT-2:

Relational Models   **10 hours**

Relational Model – Scheme & relations – Relation Algebra – SQL Query language Relational database design – Phases of database design – Design principles: What should be modeled?; Unique representation of facts – Null values – Functional dependencies – Axioms for functional dependencies Normal forms based on functional dependencies

UNIT-3:

Basic concepts in DBMS   **9 hours**

Basic concepts of DB recovery- Concurrency control – DB security – Integrity & Distributed DB

ORACLE: Basic parts of SQL statements, - Creation of code through SQL Plus DDL, DML, TCL, DCL commands

UNIT-4:   **9 hours**

Client/Server

Client/ Server Computing – Overview - what is client/server computing, benefits – Evolution (h/w trends, s/w trends) - Client/Server Applications – Implementing Client / Server Computing

UNIT-5:

Concepts of Client and Server   **9 hours**

Client Hardware and Software – Client software products (GUI environments) – Client requirements - Server Hardware (benchmarks, categories, features) – Server Environment – Requirements – Data management and access tools

Text Book:

1.Abraham Silberschatz, Henry F.Korth, S.Sudarshan - Database System Concepts -

McGraw Hill international edition – fourth edition. 2001
2. Dawna Travis Dewire ., "Client/Server Computing" - McGraw Hill international edition.1993

UNIT I: Chapters 1, 2
UNIT II: Chapters 3, 4, 7
UNIT III: Chapters 6, 16, 17, 19
UNIT IV: Chapters 1, 2, 3, 4
UNIT V: Chapters 5, 6, 7, 8, 9, 11, 12

Reference:
1. Raghu Ramakrishnan/ Johannas Gehrke – Database Management System- second edition
2. **C.J.Date** - Database system concepts – Addition Wesley publication co Ltd-1995.

Subject code: P1MSE33S	SEMESTER III	Total Contact hours: 45 hrs
Credits : 3	ENTERPRISE RESOURCE PLANNING	Contact hours per week: 3 hrs

OBJECTIVES
- To understand the architecture of the ERP systems.
- To understand ERP models and information flows underlying the ERP software.
- To understand the linkages with organizational processes.
- To identify basic principles and issues behind the ERP system design and configuration.
- To understand issues involved in ERP implementation.

UNIT I   **9 Hours**
INTRODUCTION
Enterprise an Overview –Introduction to ERP-Risks of ERP-Benefits of ERP

UNIT II   **9 Hours**
ERP AND RELATED TECHNOLOGY
ERP and Related Technologies - Business Intelligence (BI) - E-Commerce and E-Business - Business Process Reengineering (BPR) - On-line Analytical Processing (OLAP) - Product Life Cycle Management - Supply Chain Management (SCM) - Customer Relationship Management (CRM)

UNIT III   **9 Hours**
ERP MODULES
Business Modules of an ERP Package - Finance - Manufacturing (Production) - Human Resources - Plant Maintenance - Materials Management - Quality Management – Marketing- Sales, Distribution and Service

UNIT IV   **9 Hours**
ERP IMPLEMENTATION
Implementation Challenges - ERP Implementation (Transition) Strategies- ERP Implementation Life Cycle- Preimplementation Tasks- Implementation Methodologies- Training & Education

UNIT V   **9 Hours**

ERP MARKET AND FUTURE

ERP Market Place – ERP Packages – SAP AG, Oracle Corporation, PeopleSoft, JD Edwards, QAD Inc., SSA Global, Epicor, Etc.

Text Book:

Alexis Leon , "Enterprise Resource Planning", Tata McGrew Hill, 1/e, 2003

UNIT I – Chapter 1, 2, 5, 6
UNIT II - Chapter 7,8,9,10,13,14,15,16
UNIT III - Chapter 40, 41, 42,43,44,45,46,47,48
UNIT IV - Chapter 19, 20, 21,22,24,31
UNIT V – Chapter 49, 50,51,52,53,54,55,57

Reference Book:

1. Rahul V. Altekar "Enterprise wide Resource Planning, Theory and Practice", Prentice Hall of India Private Limited., Fourth Edition, 2007

Subject code: P1MSE31R	SEMESTER III	Total Contact hours: 45 hrs
Credits : 3	PURCHASE AND MATERIAL MANAGEMENT	Contact hours per week: 3 hrs

OBJECTIVES:

This paper enhances the students knowledge on material management to meet out the operational and production activities of an industry.

UNIT – I   **9 Hours**

MATERIALS MANAGEMENT: Introduction – Functions of Management as Applied to Materials – Management of Material Resources - Objectives of Material Management – primary objectives – Secondary objectives – Achieving Objectives – Effects of Business Changes - Balancing of Objectives – Limitations to Meeting Objectives.

INTEGRATED MATERIALS MANAGEMENT: Introduction – Activities of Materials Management – Importance of Materials Department – Costs involved in the management of materials – Need for integrated concept – areas of materials management – Materials management and production control – Inspection of purchased items – Relative status of the materials manager - Desirable qualities of purchasing and materials manager – Interdepartmental relationship – advantages of integrated materials management.

UNIT – II   **9 Hours**

CLASSIFICATION AND CODIFICATION OF MATERIALS: Need for classification and identification of materials – Classification of materials, general classification – Classification according to condition of materials – Nature of codification – Process of codification – Merits of codification – Demerits of codification – Codification systems: alphabetical system, numerical system, decimal system, combined alphabetical and numerical system, brisch system, Kodak system – Stores vocabulary – Marking of strores:- colour marking , secret marking.

SPECIFICATIONS IN MATERIALS MANAGEMENT: Objective of specifications – Collaborative development – Categories of specifications:- simple specifications, complex specifications – Development of specifications;- organizational approaches – Purchase management research – Writing specifications.

UNIT – III   9 Hours

STANDARDIZATION AND VARIETY REDUCTION: Definition of standard - Historical review – Three dimensions of standards – Different levels of standards – Various foreign standards in use in India – Procedure for evolving Indian standard – Benefits of standardization – Standardization and variety reduction in products:- advantages of variety reduction – Scope of variety reduction and standardization – Techniques of variety reduction:- sales contribution analysis, consumption analysis, renard series(preferred numbers) – The Three S's-Standardization, Simplification and Specialization:- standardization, simplification.

MATERIALS PLANNING: Importance of materials planning – Definition of materials planning – Flowchart for materials planning – Techniques of materials planning:- past consumption analysis, material requirements planning.

UNIT – IV   9 Hours

STORES AND STORE KEEPING: Objectives of store keeping – Functions of storekeeper – Features of successful store keeping – Relationship of store department with other departments – Benefits of store keeping – Stores organization – Location of stores – Layout of stores – Receipt section – Types of stores – Preservation of stores – Stock taking:- methods of physical stock verification.

PRINCIPLES OF PURCHASING: Introduction - Definition of purchasing – Objectives of purchasing – Duties and responsibilities of purchase department – Principles of purchasing – Special methods of purchasing – Centralized and Decentralized purchasing – Organizing for purchase.

UNIT – V   9 Hours

PRINCIPLES OF MATERIALS HANDLING: Introduction:- Planning principles – Operating principles - Principles related with equipment – Principles of cost reduction – General Principles. – Classification of material handling equipment – Material handling equipment.

TEXT BOOK:

A.k. Chitale, r.c. Gupta - materials management text and cases – published by prentice-hall of india private limited, Delhi, 2006.

Chapter list:

Unit – I	Text Book 1 – Chapter – 1, 2
Unit – II	Text Book1 – Chapter – 3, 4
Unit – III	Text Book 1 – Chapter – 5, 6
Unit – IV	Text Book 1 – Chapter – 8, 15
Unit – V	Text Book 1 – Chapter – 10

Reference book

Purchasing and Materials Management Text and Cases – Dobler D.W and L.Lee, Mcgraw Hill, New York, 6th edition , 2008

Placed at the Academic Council Meeting held on 23.03.2013   Annexure I   M.B.A.

954

Subject code: P1MSE32R	SEMESTER III	Total Contact hours: 45 hrs
Credits : 3	**SUPPLY CHAIN MANAGEMENT**	Contact hours per week: 3 hrs

OBJECTIVE:
To familiarize the students with the concepts of supplies pertaining to purchase, storage and issue of materials and stock maintenance of finished goods for the smooth functioning of industry.

UNIT-1   **9 Hours**
Introduction of supply chain management: What is a supply chain-The objectives of a supply chain-The importance of supply chain decision-Decision phases in a supply chain-process view of a supply chain.
Supply chain performance: Achieving strategic fit and scope: competitive and supply chain strategies-Achieving strategic fit-Expanding strategic scope.
Supply chain drivers and metrics: Drivers of supply chain performance-framework for structuring   drivers-Facilities-Inventory-Transportation-Information-Sourcing-Pricing-Obstacles to achieving strategic fit.

UNIT-2   **9 Hours**
Designing distribution networks and applications to e-business: The role of distribution in the supply chain-Factors influencing distribution network design-Design options for a distribution network-e-business and the distribution network-Indian agricultural produce distribution channels: ripe for revolutionary transformation-distributing networks in practice.
Network design in the supply chain: The role of network design in the supply chain-Factors influencing network design decisions-Framework for network design decisions- models for facility location and capacity allocation-The role of IT in network design.

UNIT – 3   **9 Hours**
Demand forecasting in supply chain: The role of forecasting in a supply chain – Characteristics of forecasts – Components of a forecast and forecasting methods – Basic approach to demand forecasting – Time series forecasting methods – Measures of forecast error – Forecasting demand at Tahoe Salt – The role of IT in forecasting – Risk Management in forecasting – Forecasting in practice.
Aggregate planning in a supply chain: The role of aggregate planning in a supply chain – The aggregate planning problem – Aggregate planning strategies – Aggregate planning using linear programming – aggregate planning in excel – The role of IT in Aggregate planning.

UNIT – 4   **9 Hours**
Transportation in a supply chain: The role of transportation in a supply chain – Modes of transportation and their performance characteristics – Transportation infrastructure and policies – Design options for a transportation network – Trade offs in transportation design – Tailored transportation – The role of IT in transportation – Risk Management in transportation – Making transportation decisions in practice.

UNIT – 5   **9 Hours**

Information technology in a supply chain: The role of IT in a supply chain – The supply chain IT framework – Customer relationship management – Internal supply chain management - Supplier relationship management – The transaction management foundation – The future of IT in the supply chain – Risk management in IT – Supply chain IT in practice – IT system selection processes-Indian approach and experiences.

Coordination in a supply chain: Lack of supply chain coordination and the bullwhip effect – The effect on performance of lack of coordination – Obstacles to coordination in a supply chain – Managerial levers to achieve coordination – Building strategic partnerships and trust within a supply chain – Continuous replenishment and vendor-managed inventories - Collaborative planning, forecasting, and replenishment (CPFR) – The role of IT in coordination – Achieving coordination in practice.

Text book:-
Sunil Chopra, Peter Meindl, D.V. Kalra – Supply Chain Management --- 3rd Edition, Published by Dorling Kindersley (India) Pvt. Ltd.

Chapter lists:
Unit – 1: Text Book 1 – Chapter – 1, 2, 3
Unit – 2: Text Book 1 – Chapter – 4, 5
Unit – 3: Text Book 1 – Chapter – 7, 8
Unit – 4: Text Book 1– Chapter – 13
Unit – 5: Text Book1 – Chapter – 16, 17

Reference Book:
N.Chandrasekaran., "Supply Chain Management Process, System and Practice" Oxford University Press, 2010.

Subject code: P1MSE33R	SEMESTER III	Total Contact hours: 45 hrs
Credits : 3	TOTAL QUALITY MANAGEMENT	Contact hours per week: 3 hrs

OBJECTIVES
- To introduce the students to the basic concepts of total quality management and how the focus of TQM has become so important for all companies in recent times.
- To familiarize the students to the Philosophy and Role of TQM in Revitalizing the Organisation.
- To Enable them to Acquire Requisite Diagnostic Skills and understand the Use of the Tools of TQM

UNIT I   **8 Hours**
TOTAL QUALITY MANAGEMENT

Defining Quality - Quality as a Management framework - Quality& Competitive advantage
Quality Philosophies - DemingPhilosophy, JuranPhilosophy, CrossbyPhilosophy- Other Quality Philosophers - A.V. Feigenbaum, KaoruIshikawa, Genichi Taguchi
Evolution of TQM - Definition of TQM - TQM Framework - Stages in TQM Implementation - TQM Roadmap

UNIT II   **10 Hours**
QUALITY SYSTEMS
Quality Management Systems - ISO 9000:2000- Benefits, Requirements, Implementation, Documentation, Internal Audit, Registration,
Other Quality Management Systems - Six Sigma, CMMI, PDSA Cycle, Kaizen, Business Process Reengineering, JuranTriology

UNIT III   **9 Hours**
STATISTICAL PROCESS CONTROL
Pareto Diagram – Process Flow Diagram – Cause and Effect Diagram – Histogram – Check sheets – Scatter Diagrams
Control charts – Introduction – Variable control charts – Out of control process – Control charts for variables and attributes

UNIT IV   **10 Hours**
QUALITY TOOLS
Deming Wheel - Benchmarking - Seven QC Tools - FMEA -Poka Yoke - Five S - Quality Circle - Quality Function Deployment - Total Productive Maintenance - Force Field analysis - Tree & Matrix Diagram

UNIT V   **8 Hours**
COST OF QUALITY
Classification of failure cost ,Juran's Model of optimum quality costs ,Analysis of External & Internal Failure costs - MalcomBaldridge National Quality Award

Text Books:
1. Dale H.Besterfield,Carol Besterfield, Glen H.Besterfield,Mary Besterfield , "Total Quality Management" Prentice Hall, 2003
   a. UNIT I – Chapter 1, 2
   b. UNIT II - Chapter 5, 10
   c. UNIT III - Chapter 18
   d. UNIT IV - Chapter 13, 15, 16
   e. UNIT V – Chapter 7

References
1. R.K.Mittal, "Total Quality Management", Vol I, II, III. Rajat Publications, 1999.

Subject code: P1MSC34	SEMESTER III	Total Contact hours: 30 hrs
Credits : 1	WORKSHOP ON EMPLOYABILITY SKILLS	Contact hours per week: 2 hrs

Session No	Module	Unit Name	Topic
1	1	**Case Presentation**	Presentation Skills
2			Case Analysis
3,4,5,6		6 Hours	Group presentation of Cases
7	2	**Industry Awareness**	Resume Preparation
8			Analysis of Industries
9,10,11,12		6 Hours	Group presentation on Industries
13	3	**Company Awareness**	Aptitude Tests
14			Analysis of Companies
1516,17,18		6 Hours	Group presentation of Companies
19	4	**Products & Services**	Group Discussion
20			Analysis of Products and Services
21,22,23,24		6 Hours	Group presentation of Products & Services
25	5	**Personalities**	Personal Interview techniques
26		6 Hours	Analysis of Personalities
27,28,29,30			Group presentation of Personalities

Subject code: PIMSC41	Semester IV	Total Contact hours : 60 hrs
Credits : 4	BUSINESS ENVIRONMENT	Contact hours per week: 5 hrs

Objective:

The objective of this course is to sensitize towards the overall business environment within which organization has to function and to provide insight to students of its implication for decision making in business organizations.

UNIT 1:-
Introduction   10 Hours

Business System - Classification, Characteristics; Business Environment - Concept, Significance - Types of Business Environment; Environmental Analysis – Importance - Techniques - Approaches.

UNIT II:-
Economic & Global Environment   14 Hours

Economic Systems - Characteristics - Functions - Types; Economic Planning - Scope - Significance - Economic Planning in India; Economic Policies - Industrial Policy - Monetary policy - Fiscal policy; GATT & WTO; Liberalization - Globalization - Privatization; Regional Trade Blocks; Multi National Corporations - Reasons – Advantages - MNC's in India

UNIT III:-
Social & Cultural Environment   12 Hours

Culture & Business - Nature - Elements - Impact of Foreign Culture on Indian Business; Social Responsibilities - Social Audit - Business Ethics & Values - Elements - Levels - Developing Corporate Ethical Programme - Corporate Governance

UNIT IV:-
Technological Environment   12 Hours

Meaning - Factors - Indicators of Technological Progress - Management of Technology - Technology & Competitive Advantage - Innovation - IT & Marketing
Political Environment

Indian Constitution - Characteristics - Federal systems - Fundamental Rights & Duties - Principles of State Policy - Economic Roles of Government - State Intervention - Government & Regulatory Environment

Unit V
Legal Environment   12 Hours

The Contract Act, 1872 - The Companies Act, 1956 - The Foreign Management Act, 1972 - The Environment Protection Act, 1986 -   Securities and Exchange Board of India Act, 1988

Text Book:
1. Business Environment – C. B. Gupta, Sultan Chand & Sons (Edition: 2005)
   Unit I – Chapters 1, 2, 4
   Unit II – Chapters 14, 15, 17, 25, 29

Unit III– Chapters 9, 11, 12, 13
Unit IV – Chapters 24, 5, 6
Unit V – Chapters 7

References:
1. Francis Cherunnilam - Business Environment, Text&cases, Himalaya Publications Eighteenth edition-2009
2. Elements of Mercantile Law – N. D. Kapoor, Sultan Chand & Sons (Edition: 2010)

Subject Code : P1MSC42	SEMESTER IV	Contact Hours Per semester: 60 hrs
Credits : 4	STRATEGIC MANAGEMENT	Contact Hours Per Week : 5 hrs

Objective:

The objective of this course is to develop a holistic perspective of an organisation and to enable the students to analyse the strategic situation facing the organisation, to access strategic options available to the organisation and to implement the strategic choices made by it.

UNIT I   **12 Hours**
An overview of strategic Management and Business Policy –Evolution, Importance, Characteristics, benefits and pitfalls, strategic management models, Strategic management decision making process - Issues.

UNIT II   **12 Hours**
Hierarchy of Strategic Intent – Understanding Strategic Intent
Vision – Nature, Definition, benefits, the process of Envisioning.
Mission – Definition – How are mission statements Formulated and communicated? - Characteristics of a mission statement.
Business Model - Goals and Objectives - Role of Objectives- Characteristics – Issues in Objective setting- What objectives are set? – How objectives are formulated? –Balanced scorecard Approach to objective setting-Critical Success factors- Key Performance Indicators.

Unit III   **12 Hours**
External Environment - Environmental factors-Concept of Environment-Characteristics of Environment -Environmental Scanning-Factors to be considered for Environmental scanning-Approaches to Environmental scanning- Environmental threats and opportunities profile-Environmental forecasting techniques, Industry analysis, Michel Porter's Model.

Unit IV   **12 Hours**
Internal Environment - Nature of Internal audit- -BCG Portfolio Matrix, General Electric Spot light Strategy- Hoofers Analysis-Product life cycle analysis, Value Chain analysis.

Unit V   **12 Hours**
Strategic alternatives: Survival, stable growth, Retrenchment, Turnaround strategy, combination strategies and sub strategies for these.
Strategic Analysis and Choice & Strategic implementation and Evaluation - Process of strategic choice-Focussing on strategic alternatives-Analysing the strategic alternatives—Evaluating the strategic alternatives-Choosing from among the strategic alternatives-Tools and techniques for strategic analysis – SWOT analysis –Life cycle analysis.   Nature & Barriers to strategy Implementation - Forward linkages-Backward linkages – A model of strategy implementation.

Text Books
1. Azhar Kazmi. - Strategic Management and Business Policy –Tata McGraw Hill, 3ʳᵈ Edition.
2. William F.Glueck, Lawrence R.Jauch- .Strategic Management and Business Policy- –Tata McGraw Hill, 5ᵗʰ Edition

Unit I Text Book 1 (Chapter 1)
Unit II Text Book 1 (Chapter 2)
Unit III Text Book 1 (Chapter 3)
Unit IV Text Book 1 (Chapter 4)
Unit V Text Book 2 (Chapter 6)

Reference

Collin White., "Strategic Management" Palgrave Macmillan, 2004.

Subject Code : P1MSE41F	SEMESTER IV	Contact Hours Per semester: 45 hrs
Credits : 3	**BANKING SERVICES OPERATIONS**	Contact Hours Per Week : 5 hrs

OBJECTIVE:

To enable the students to appreciate the dynamic changes that have taken place in Contemporary Banking operations over a period of time due to advancement of Technology, Globalization and Customer needs.

UNIT I **9 Hours**

INTRODUCTION TO BANKING SERVICE OPERATIONS

The Changing Nature of Banking Operations – Importance of Customer Relationship Management in Banks – Different Types of Products and Services Offered to Customers – Role of Technology in Banking Operations – Bookkeeping and Maintenance of Accounts – The Need for Asset-Liability Management – Regulatory Framework for Compliance

Services Design and Delivery Strategies in Banks – Products and Services offered by Banks – Designing of New Products and Services – Response of Banks with Newer Services and Delivery Mechanisms – Delivery Strategies in a Bank – Designing of Service Quality – Steps to implement Delivery Strategies – Implications of Service Intangibility

UNIT II **9 Hours**

TRENDS IN ELECTRONIC BANKING

Electronic Banking: Market Assessment – E-Banking: An Introduction – Internet: E-Commerce, E-Banking – E-Banking in India – Internet Banking Strategy – Risks in E-Banking

Recent Trends of IT in Banking – The Branch renaissance – The Migration to an Online Environment – Customer Relationship through Portals – The Digital Age of Banking

UNIT III **9 Hours**

FACILITIES MANAGEMENT

Cost Reduction Exercise – Role of Technology – Significance of Computerisation in Banks – Finance Portals for the Banking Industry

Payment and Settlement Systems, RTGS and Clearing House – Emerging New Instruments – Risk Factors for Payments Systems – International Standards on Payment Systems – Role and Concern of Central bank and Participants – Payment and settlement Systems in India – Real Time Gross Settlement – Developments in the Payment and settlement Systems – Clearing House

UNIT IV **9 Hours**

SERVICE QUALITY METRICS

Core factors – Customer Relationship Management – Technical quality and Functional Quality – Role and Process Capability for Managing Services – Managing Service Delivery – ISO 9000 Certification in Banking Services

Improving Quality and Productivity – Banking Services: Technical Quality and Functional Quality – Determining What Satisfies the Customer – Customers' Perception of Banking Service Quality – Devising Quantitative Determinants – Non-Quantitative determinants – Quality by Design: Formulating a Suitable Standard – Quality Assurance – Improving Productivity and Performance

UNIT V   **9 Hours**
RISK MANAGEMENT

Introduction to Risk Management – What Risk is All About – Basic Purpose of Risk Management in Banks – The Process of Risk Management – Different Types of Risks in Banks – Overview of Enterprise wide Risk Management in Banks

Risk Management Strategies – Operational Risk Management Strategies – Financial Risk Management Strategies – Systemic Risk Management Strategies – Risk Limitation – IT Implementation Challenges

Text Books:
Banking Services Operations – The ICFAI University Press – 2009 Author
         UNIT I   – Chapter 1, 2
         UNIT II   - Chapter 3, 5
         UNIT III   - Chapter 6, 8
         UNIT IV   - Chapter 9, 10
         UNIT V   – Chapter 12, 15

Reference Book:
Edited by Nainalal Kidwai – Contemporary Banking in India – Business World - 2012

Subject code: P1MSE42F	SEMESTER IV	Total Contact hours: 45 hrs
Credits : 3	INCOME TAX	Contact hours per week: 5 hrs

Objective: This course gives detailed knowledge about the Theory and Practice in Income tax laws under various heads of income.

Unit I   **9 Hours**

Income Tax Act, 1961 – Definitions under sec.2 - Agricultural Income, Residential Status and Incidence of Tax – Exempted Incomes – Income Tax Authorities and their Powers – Current Finance Act.

Unit II   **9 Hours**

Income under the head Salaries – Allowances – Perquisites – provident Funds – deductions – Tax Rebate – Computation of Salary Income (simple problems). Forms used to file returns along with Form 16.

Unit III   **9 Hours**

Income from House Property – Annual Value – Deductions – Computation – let out Houses and self Occupies Houses (simple problems).

Unit IV   **9 Hours**

Profits and Gains of Business or Profession – Chargeability – Admissible deductions – Inadmissible expenses – Computation of Business Income (Excluding Firms and Companies) – Computation of Professional Income. Forms used to file returns. (Simple problems)

Unit V   **9 Hours**

Capital gains – Definition of Capital Assets – Kinds – Exempted Capital Gains – Computation of Income from other Sources (simple problems). Deduction of tax at source. Procedure for filing income tax returns Online, for individual.

TEXT BOOK:
Bhagwati Prasad, Direct Taxes - Law and Practice, Wishwa Prakashan publishers
        Unit I: Chapters 1, 2, 4, 5, 22
        Unit II: Chapters 6
        Unit III: Chapters   7
        Unit IV: Chapters 8
        Unit V: Chapters 10, 11, 29

Reference Books:
Dinkar Pagare – Law and Practice of Income Tax
B.B.Lal, Direct Taxes, Konark Publishers Pvt. Ltd
Dr.Vinod K.Singhania, Student's Guide to Income tax, Taxmann
http://incometaxindia.gov.in

Subject code: P1MSE43F	SEMESTER III	Total Contact hours: 45 hrs
Credits : 3	SECURITY ANALYSIS	Contact hours per week: 5 hrs

Objectives:

Any form of Investment requires some analysis. This course gives an exposure regarding the Analysis of the security to ratify our Investment decision.

Unit –I
     Sources of Investment Information and Inflation   **9 Hours**
Types of Information- Need of Information- Uses of these data. What is Inflation?- Traditional Explanation of Inflation- demand Pull and cost Push Inflation- Structural Factors- Inflationary Tendencies- Inflation Indicators – Causes of Inflation – Effects of Inflation- Inflation- Impact of Govt. Measures- Role OF RBI- Credit Control by RBI – responsibility of RBI- Inflation on Investments-Inflation and Investment Decisions

Unit –II   **9 Hours**
    Investment Decisions
Investment Management Involves Correct Decision Making- What is Investment Management?- Criteria for Investment Decision – Risk and Investment- What is Fundamental Analysis?- Investment

objectives- Cost- Benefit Analysis- Environmental Considerations- Chit Funds and Nidhis- Tax Planning in Investment Management- Execution of Investment Decisions.

Financial Analysis and Interpretation

What is Financial Management?- Components of Financial Statements- Comparison of the Financial Statement-Ratio Analysis- Usefulness of ratio analysis- Fund Flow analysis- Trend analysis

Balance Sheet Analysis and Blue Chips

Annual Reports- market Price and Corporate performance- Analysis of Financial Position- Types of Shares in the market- Growth Shares- Cyclical Shares- Defensive Shares- Discount Shares- Net financial Results and Profitability- Corporate Performance- How to locate Emerging Blue Chips?- Established Blue Chips.

Unit III   **9 Hours**

Fundamental Analysis

Influence of the economy – Economy vs. Industry and company – Industry Analysis- Example of an Industry Analysis-Petro- Chemicals- Company Analysis- Need for Forecast- Guidelines for Investment – Example of Company Analysis – How to pick Up Growth Shares? Pharma Industry – Profile of Pharma Industry.

Unit –IV   **9 Hours**

Technical Analysis

Importance of Timing in Investment- Basic Tenets of Technical Analysis- Tools of Technical Analysis- Dow Theory- major Trends- Chartist Method- Breadth of the Market- Volume of Trading- Tripod of Technical Analysis - Principles of Technical Analysis- Charts and Trend Lines- Moving Averages-Advantages of Moving Averages - Criticism of Dow Theory- Charts - Head and Shoulders- Breaking and Neckline – Resistance and Support Lines- Speculative Trading and Technical Analysis- Elliot Wave Theory – Operation of Wave Theory – Oscillators (Rate of change or ROC)

Unit-V   **9 Hours**

Efficient Market Theory

Assumptions- Random Walk Theory- Assumptions of Random Walk Theory- Random Walk and Efficient Theory - Empirical Tests- Filter Tests- Serial Correlation Tests- run Tests- Other Tests- Mutual Fund Performance- Efficient Market Hypothesis- semi Strong Form, Strong from of EMH- Markets in India- Critique of EMH.

Text Book:

V.N. Avadhani- Investment Management- Himalaya Publishing House, 7th Edition

Unit I	- Chapter 20, 21, 22
Unit II	- Chapter 23, 24, 25
Unit III	- Chapter 26
Unit IV	- Chapter 27
Unit V	- Chapter 28

Reference Books

Donald E.Fischer, Security Analysis and Portfolio Management Pearson Prentice Hall, 2009

Samir K.Barun, Portfolio Management, Tata Mc Graw Hill Pub., 2007

S.Kevin, Security analysis and Portfolio Management, PHI Learning Private Ltd, 2009

VIRUDHUNAGAR HINDU NADARS' SENTHIKUMARA NADAR COLLEGE
(An Autonomous Institution Affiliated to Madurai Kamaraj University)
[Re-accredited with 'A' Grade by NAAC]
Virudhunagar – 626 001

Subject Code : P1MSE41M	SEMESTER IV	Contact Hours Per semester : 45 hrs
Credits : 3	SERVICES MARKETING	Contact Hours Per Week : 5 hrs

Objectives:

To understand the service product and key elements of service marketing mix. It deals with managing the service delivery process and the implementation of services marketing.

Unit –I   **9 Hours**
Development of services marketing: Introduction –marketing defined-The marketing mix-Special Characteristics of services-The Nature of the service product.

Unit II   **9 Hours**
Services Marketing and Relationship Marketing: Role of marketing - marketing and customer orientation - inter-functional relationship - relationship marketing - Determining marketing emphasis in relationship marketing.

Unit III   **9 Hours**
Services marketing mix: Value creation – Inadequacy of 4Ps – modified marketing mix for services - Product –Price – Service in promotions-Place in Promotions - Physical evidence in services - process in services.

Unit IV   **9 Hours**
Positioning and differentiation of services: The evolution of positioning – Competitive differentiation of services-positioning and services –the levels of positioning-the process of positioning-the importance of positioning.

Unit V   **9 Hours**
Marketing planning process – Strategic context-situation review-marketing strategy formulation-Resource allocation and mentoring-marketing planning and services.

Text Book:

1. Christopher Lovelock - . Service Marketing –Prentice Hall Fourth edition
2. Helen woodruffe" Sales marketing" Macmillan india limited, 1998.
3. Service Marketing Text & cases – Harsh V.Varma – (Pearson)2008

Unit –I (Chapter 1 Services Marketing - Helen woodruffe)
Unit II (Chapter 2 Services Marketing - Helen woodruffe)
Unit III (Chapter 2 Services Marketing – Harsh V.Verma)
Unit IV (Chapter 3 Services Marketing –Lovelock)
Unit V (Chapter 7 Services Marketing – Hellen woodruffe)

Reference Book:
Valarie A Zeithaml., Dwayne D Gremler., Mary Jo Bitner., Ajay Pandit., "Services Marketing – Integrating customer focua across the firm" Tata McGraw Hill Edition, 2008.

Subject Code : P1MSE42M	SEMESTER IV	Contact Hours Per semester : 45 hrs
Credits : 3	RETAIL MANAGEMENT	Contact Hours Per Week : 5 hrs

Objectives:

The objective of the course is to provide insights on retail operation. This will enable the students to become good retail planners and decision makers and help focus on change and adaptation to change.

Unit – I   **9 Hours**
Introduction – The nature of change in retailing- Categorising retailers, A retailing career - the study and practice of Retailing.

Unit – II   **9 Hours**
Retail strategic planning and operations management-Components of strategic planning-mission statements-statement of goals and objectives.

Unit –III   **9 Hours**
Retail Customers-Population growth-Age Distribution-Geographic Trends – Social Trends-Education –marriage and divorce-Economic Trends – Income growth personal Savings.

Unit – IV   **9 Hours**
Channel Behaviour -Type of marketing channels-Channel length- Channel width –Channel control – Merchandise presentation methods-visual merchandising-store front design – Interior design-Lighting design-sounds and smiles.

Unit –V   **9 Hours**
Market selection and retail location analysis-Select Target market- Market segmentation-Identification-retail location Theories-market demand potential –Market supply factors.

Text Book:
        1. Retailing – Patrick M.Dunne, Robert F.Lusch, David A. Giffiths, Thomson south western fourth edition
                Unit I – Chapters 1
                Unit II – Chapter 2
                Unit III – Chapters 3
                Unit IV – Chapters 4
                Unit-V - Chapters 7
Reference Book:
        1. Ron Hasty & James Reardon "Retail Management" – The McGraw-Hill Companies, Inc. International edition,- 1997

Subject Code : P1MSE43M	SEMESTER IV	Contact Hours Per semester : 45 hrs
Credits : 3	BRAND MANAGEMENT	Contact Hours Per Week : 5 hrs

Objective

To introduce the concept of branding and brand management with special emphasis an developing brand equity.

Unit –I   **9 Hours**

Branding as a concept – Strategic relevance of branding- Brand name- Creating a Brand – Principles of Brand creation- How to build a brand –Brand image – Branding of commodities- Special consideration in Branding of a commodity.

Unit-II   **9 Hours**

The Role of Brands - Scope of Branding- Defining Brand Equity- Choosing brand elements- Designing holistic marketing activities- Leveraging secondary associations. Brand valuation – Brand reinforcement (Chapter to Philip Kotler) marketing devising a brand strategy: Brand decisions- Brand Extensions- Brand portfolios- Brand benefits and attributes

Unit –III   **9 Hours**

Brand positioning: Definitions - Components of Positioning – Consumer segmentation- Perceptual mapping- Cornerstones of positioning strategy.

Unit –IV   **9 Hours**

Research Techniques for brand positiours – Image profile analysis- Cluster analysis – multidimensional scaling- conjoint analysis- New product opportunities and preferred positions- A new measure of Advertising effectiveness.

Unit –V   **9 Hours**

Developing and communicating a positions strategy- Competitive frame of reference –Points of difference and points-of-party- Establishing category membership –Choosing POPs and PODs- Creating POPs and PODs

Text Book:

1. Philip Kotler, Keller, Koshy, Jha- Marketing Management – Pearson 13th Editions
2. Subroto Senguptha - Brand positioning strategies for competitive advantage Tata McGraw hill ltd - 1995
3. Ramanuj majumdhar- Product Management in India- practice hall of India second edition

        Unit –I Chapter 2 (Product management- Ramanuj majumdhar.)
        Unit-II Chapter 10 (Philip Kotler) Marketing
        Unit –III (Brand Position Subroto Senguptha.)
        Unit –IV Chapter 11 (Brand Position) Subroto Senguptha.
        Unit –V Chapter 11 (Marketing Philip Kotler)

Reference Book:

        Rik Riezebos, H. J. Riezebos, Bas Kist, Gert Kootstra "Brand Management: A theoretical and practical approach" Financial Times Prentice Hall, 2003

Subject Code : P1MSE41H	SEMESTER IV	Contact Hours Per semester : 45 hrs
Credits : 3	**STRATEGIC HUMAN RESOURCE MANAGEMENT**	Contact Hours Per Week : 5 hrs

Objective:

The objective of the course is to develop the perspective of strategic human resource management. Specifically the course has the following objectives:

1. Distinguish the strategic approach to human resources from the traditional functional approach.
2. Understand the relationship of HR strategy with overall corporate strategy.
3. Understand the strategic role of specific HR systems.
4. Appreciate SHRM in the context of changing forms of organisation.

UNIT – I   **9 Hours**

The Concept of HRM – Concept of Strategy – Concept of Strategic HRM – Strategic fit characteristics of HR strategy - Resource based Strategic HRM – Intellectual capital defined – Human capital – Social capital – Organalisational capital.

UNIT – II   **9 Hours**

Models of Strategic HRM – General model – High Performance working model – High Involvement management model – Sequential Strategic HRM model.

UNIT – III   **9 Hours**

Organizational HR strategies – Strategies for culture change – Strategies for knowledge management - Organalisational HR strategies in action.

UNIT – IV   **9 Hours**

Strategic role of HRM – Strategic HR versus Traditional HR – Barriers of strategic HR - Outcomes of strategic HR – Strategic needs.

UNIT – V   **9 Hours**

Strategic HRM in action – Integrating the business and HR strategies – The formulation of HR strategy -Strategy HR practices that Improve business performance – A practical approach to the development of the HR strategies.

Text Book:-

1. Strategic HRM- Michael Armstrong, angela baron- Jaico publication house second edition-2008.
   Unit I – Chapters 1,4
   Unit II – Chapter 5
   Unit III – Chapters 9
   Unit IV – Chapters 4 in SHRM by Jeffrey A.Mello(Reference)
   Unit-V - Chapters 11,12,

Reference:-

strategic Human Resource Management- Jeffrey A. mello Cengage learnilg india pvt ltd – 2001 first edition

Subject Code : P1MSE42H	SEMESTER IV	Contact Hours Per semester : 45 hrs
Credits : 3	**EXECUTIVE DEVELOPMENT**	Contact Hours Per Week : 5 hrs

Objective:
To familiarize the students to understand the concepts of Organaisation and Executive development and utilize these basics when they enter in to organaisation.

Unit I 9 Hours
Introduction-Objectives-Committee-Executive development centre-planned management Succession System-manpower planning and objectives-manpower forecasting system.

Unit II 9 Hours
Executive recruitment-Selection and induction-Sources of executive talent-Positions descriptions-application Blanks.

Unit III 9 Hours
Executive Training with reference to SHRM-Strategies for Managing Competitive environment-Global Competition.

Unit IV 9 Hours
Executive development facilities-Utilisation of trained executives-Evaluation of executive development in different organization.

Unit V 9 Hours
Executive Learning-Principles of Learning-Condititon for learning-The Learning Cycle-Executive Learning and Memory-E-Learning for executives.
Text Book
M.N.Rudrabasvaraj- Executive Development in India& abroad -Himalaya Publishing House-1st Edition:2001
    Unit I - Chapters 1
    Unit II - Chapter 3
    Unit III – Chapters 4
    Unit IV - Chapters 6,8
    Unit V - Chapters 8
References
P.L.Rao- Training and Development Anurag Jain publishers-Ist Edition-2008.

Subject code: PIMSE43H	Semester IV	Total Contact hours : 45 hrs
Credits : 3	**PERFORMANCE MANAGEMENT**	Contact hours per week: 5 hrs

Objective:
This course is designed to develop appreciation and skills essential for designing and instituting effective performance management system.

Unit I   **9 Hours**

Performance Management – Definition, Scope, Characteristics, Aims & Role, History of Performance Management, Principles, Issues, Benefits & Criteria For Success, Performance Management Cycle.

Unit II   **8 Hours**

Performance Management Process – Performance Planning, Performance Execution, Performance assessment, Performance Review, Performance Renewal & Recontracting

Unit III   **9 Hours**

Performance Standards, Objectives - Characteristics, 360 Degree Feedback - Conducting Performance and development reviews – Preparations for meeting, Guidelines & review

Unit IV   **10 Hours**

Implementing Performance Management System – Defining Performance, Determinants, Dimensions, Approaches to Measure Performance, Measuring Results and Behaviours, Competence & Competence Analysis.

Unit V   **9 Hours**

Reward Systems – Pay Plans, Legal Principles Affecting Performance Management, Managing Team Performance - Definition, Importance and Types of Teams, Rewarding Team Performance, Performance Problem Solving, coaching & Counseling

Text Book:
1. Herman Aquinis, "Performance Management", Pearson Education, 2010, Second Edition
2. Michael Armstrong & Angela Baron, "Performance Management", Jaico Publishing House, 2008
   Unit I – Chapters 1(Herman Aquinis) 1, 3, 4 (Michael Armstrong & Angela Baron)
   Unit II – Chapters 2 (Herman Aquinis)
   Unit III– Chapters 16, 18, 19 (Michael Armstrong & Angela Baron)
   Unit IV – Chapters 4, 5 (Herman Aquinis) 17 (Michael Armstrong & Angela Baron)
   Unit V – Chapters 10, 11, 14 (Herman Aquinis) 20, 21 (Michael Armstrong & Angela Baron)

Reference:
1. R. K. Sahu, "Performance Management System", Excel Books, New Delhi,2009

Subject Code : P1MSE41S	SEMESTER IV	Contact Hours Per semester : 45 hrs
Credits : 3	DATA MINING AND DATA WAREHOUSING	Contact Hours Per Week : 5 hrs

Objective:

To familiarize the students to understand the concepts behind in data mining and data ware housing

Unit-1   **8 hours**

Introduction to Data mining: Data mining has come of age-the motivation for data mining Is tremendous-learning from your past mistakes-measuring data mining effectiveness: aaccuracy, speed, and cost –state of the industry-comparing the technologies

Decision tree: introduction to decision tree-business score card-how the decision tree works-strengths and weakness.

Neural networks: introduction to networks-where to use neural networks-the general idea-how the neural networks- strengths and weakness.

Unit-2   **11 hours**

Nearest neighbor and clustering: business score board-where to use clustering and nearest-neighbor predication-the general idea-how clustering and nearest –neighbor predication work- strengths and weakness.

Genetic algorithms: introduction to genetic algorithms-where to use genetic algorithms-the general idea-how the algorithm works- strengths and weakness.

Rules induction: business score card-importance- how the rule induction works-strengths and weakness.

Selecting and using the right technique: the data mining process-what all the data mining techniques have in common-data mining in the business process.

Unit -3   **9 hours**

Data warehousing components: overall arichitecture-datawarwhouse databases-sourcing, acquisition, cleanup, and transformation tools- metadata-access tools-data marts-data ware house administration a multidimensional and management

Unit -4   **10 hours**

Business a data warehouse: Business considerations: return on investment-design considerations-technical considerations-implementation considerations-integrated solutions-benefits of data warehousing.

Mapping the data warehouse to a multiprocessor architecture: relational database technology for data warehouse-database architectures for parallel processing-parallel RDBMS features-alternative technologies-parallel DBMS vendors.

Unit -5   **7 hours**

On-line analytical processing: need for OLAP-multidimensional data model-OLAP guidelines- multidimensional versus multirelational OLAP-categorization of OLAP tools-state of the market-OLAP tools and internet.

Patterns and models: definitions-a note on terminology- where are models used-what is the "right model"?-sampling-experimental design.-computer-intensive statistics-picking the best model.

Text Book:
Alex Berson, Stephen J.smith, Data warehousing - Data mining & OLAP - Tata McGrawHill 2008

Reference Book:
1.Bhart Bhushan Agarwal and Submit Prakash Tayal – Data Mining and Data Warehousing – University Science Press-2009.
2.Margart H.Dunham – Data Mining Introductory and Advanced Topics – Pearson Edn.,2003.
3.George M.Marakas – Modern Data Warehousing, Mining and Visualization – Person edn.,2003.

Chapter List:
UNIT I: Text book 1 – Chapter 17, 18,19
UNIT II: Text book 1 – Chapters 20, 21, 22
UNIT III: Text book 1 – Chapters 6
UNIT IV: Text book 1 – Chapters 7, 8
UNIT V: Text book 1 – Chapters 13, 14

Subject Code : P1MSE42S	SEMESTER IV	Contact Hours Per semester : 45 hrs
Credits : 3	NETWORK MANAGEMENT AND INFORMATION SECURITY	Contact Hours Per Week : 5 hrs

OBJECTIVES
- To analyse networking requirements, evaluate networking options
- To give a conceptual outlook of the various security issues in the networking
- To provide a broad based measures to prevent network threats

UNIT I   **9 Hours**
Data Communications – Overview – TCP/IP Based Networks – Communication protocols- Network Topology – LAN – Network Node Components - WAN

UNIT II   **9 Hours**
Network Management – Goals, Organization, and Function – Tools – Systems and Applications

UNIT III   **9 Hours**
Security Problems in Computing – Security Definition, Attacks, Computer criminals, Methods of Defence – Encryption.

Cryptography – Terminology and Background – Substitution Ciphers – Encryption Algorithms – Data Encryption Standard – Public key Encryption

UNIT IV   **9 Hours**
Program Security - Secure programs – Non-malicious Program errors – Viruses and other malicious Code- Control against Program Threats

Network Security – Threats – Network Security Controls – Firewalls – Intrusion Detection systems

UNIT V   **9 Hours**
Privacy in Computing - Concepts - Policies and Principles – Authentication and Privacy – Email Security

Legal and Ethical issues in Computer Security – Patents, Copyrights, Trade secrets -Information and Law - Computer Crime.

Text Books:
Mani Subramanian "Network Management, Principles and Practice"., Dorling Kindersley (India) Pvt. Ltd. Pearson Education., Seventh Impression 2010.

> a. UNIT I – Chapter 1, 2
> b. UNIT II - Chapter 1, 12, 13

Charles P.Pfleeger., Shari Lawrence Pfleeger., Deven shah., "Security in Computing" ., Dorling Kindersley (India) Pvt. Ltd. Pearson Education., 2009.
> c. UNIT III - Chapter 1,2
> d. UNIT IV - Chapter 3, 7
> e. UNIT V – Chapter 10, 11

References
William Stallings., "Network Security Essentials, Applications and Standards" Pearson Education., 2001

Subject Code : P1MSE43S	SEMESTER IV	Contact Hours Per semester : 45 hrs
Credits : 3	WEB PAGE DESIGNING USING PHP AND MYSQL	Contact Hours Per Week : 5 hrs

Objective:
To describe the concepts in PHP and enhance the students to design the web sites.

Unit -1 10 hours
Introduction to PHP: basic syntax-sending data to the web browser-writing comments-what are the variables-introducing strings-concatenating strings- introducing numbers-introducing constants-single vs. double quotation marks.

Programming with PHP: creating an HTML form-handling an HTML form-conditions and operators-validating form data- introducing arrays-for and while loops.

Creating dynamic web sites: including multiple files-handling HTML forms, revisited-making sticky forms-creating your own functions.

Unit -2 9 hours
Introduction to MySQL: naming database elements-choosing your column types-choosing other column properties-Accessing MySQL.

Introduction to SQL: creating database and tables-Inserting records-selecting data –using conditionals-using LIKE and NOTLIKE-sorting query results-limiting query results-updating data-deleting data- using functions.

Advanced SQL and MySQL: database design-performance joins-grouping selected results-creating indexes-using different table types-performing FULLTEXT searches-performing transactions.

Unit-3 8 hours
Error handling and debugging: error types and basic debugging-displaying PHP errors-Adjusting error reporting in PHP-creating custom error handlers-PHP debugging techniques-SQL and MySQL debugging techniques.

Using PHP with MySQL: modifying the template-connecting to MySQL-Executing simple queries-retrieving query results-ensuring secure SQL-counting returned records-updating records with PHP.

Unit -4 9 hours
Common programming techniques: sending values to a script-using hidden form inputs-editing existing records-paginating query results-making sortable display.

Web application development: sending email-date and time functions- handling file uploads-PHP and JavaScript-understanding HTTP headers.

Unit -5: 9 hours
Cookies and sessions: making a login page-making the login functions-using cookies-using sessions-improving session security.

Security methods: preventing spam-validating data by type-preventing XSS attacks-preventing SQL injection attacks-database Encryption.

Text Book:
Larry Ullman "PHP6 And Mysql5" Pearson Education first edition- 2008
Chapter List:

UNIT I: Text book 1 – Chapter 1,2,3
UNIT II: Text book 1 – Chapters 4,5,6

UNIT III: Text book 1 – Chapters 7,8
UNIT IV: Text book 1 – Chapters 9,10
UNIT V: Text book 1 – Chapters 11,12

Reference
Luke Welling , Laura Thomson "PHP and MySQL Web Development" Sams Publisher(4th Edition)

Subject Code : P1MSE41R	SEMESTER IV	Contact Hours Per semester : 45 hrs
Credits : 3	WORLD CLASS MANUFACTURING SYSTEM	Contact Hours Per Week : 5 hrs

Objective
This programme will help the students to improve their skill on strategic planning and tactical execution, elimination on non-value added activities and costs, reduce work place strees level and increase speed also help them to improve quality and customer satisfaction to achieve the competitive production activities.

UNIT-1   **9 Hours**
 Historical   perspective: World class excellent organizations – American and Japanese companies Deming Awards , Malcom Baldrige National Quality Award – Globalization – Global companies – Models for manufacturing excellence – Business Excellence.

UNIT-2.   **9 Hours**
 Bench marks, Bottlenecks and Best practices: Concepts of benchmarking, bottleneck and best practices, Best performers- Gaining competitive edge through world class manufacturing – Value added manufacturing – eliminating waste – Toyota production system**.**

UNIT-3   **9 Hours**
System &tools for world class manufacturing: Improving product & process Design – Lean production – SQC, FMS, Rapid prototyping, poke yoke, 5-S, 3M, use of IT, JIT, Product Mix, Optimizing , procurement & stores practices Total productive maintenance, Visual Control**.**

UNIT-4   **9 Hours**
 Human Resource Management in WCM: Adding value to the organization – Organizational learning – techniques of removing root cause of problems – people as problems solves – New organizational structures Associates – Facilitators –Teams man ship - Motivation and reward in the age of continuous improvement.

UNIT-5   **9 Hours**
Typical characteristics of WCM companies: Performance indicators – what is world class performance – Six Sigma philosophy**.**

TEXT BOOK
World class Manufacturing – strategic perspective – B.S Sahay, KBC Saxena, Ashish Kumar.

Reference
1. Making Common Sense common practice – Models for manufacturing excellence – Ron Moore (Butter worth Heinmann)
2. The Toyota Way – Jeffrey K.Liker-(Tata McGraw Hill)
3. Operations Management for Competitive Advantage – chase
4. Making Common Sense common Practice – Moore

5. Managing Technology & Innovation for Competitive Advantage – Narayanan
6. Just In Time Manufacturing – M.G.Korgaonkar
7. Machine That Changed The World – Womack

Subject Code : P1MSE42R	SEMESTER IV	Contact Hours Per semester : 45 hrs
Credits : 3	BUSINESS PROCESS MANAGEMENT	Contact Hours Per Week : 5 hrs

OBJECTIVES
- To provide insight to the business operations
- To make the students realize the difficulties in implementing new changes and making them realize the importance of process reengineering

UNIT I   **9 Hours**
The strategic benefits of business community integration - The beginnings of collaborative commerce - The virtual organization - End-to-end business process management
E-business strategy - The web-enabled organization - Measurement of value and return on investment- Outsourcing and application service providers

UNIT II   **9 Hours**
Web-enabling technology -The Internet and the Web -Intranets and extranets - Mobile and wireless technology - Broadband (high-speed packet-based wireless) - Electronic invoicing and payments - E-treasury - Physical and technical security tools - Industry standards

UNIT III   **9 Hours**
Enterprise resource planning - Process management using ERP- Advantages of ERP - Problems encountered with ERP
Human resource management - E-recruitment - E-learning - Information management delivering business intelligence
Supply/demand chain strategy - E-manufacturing - Front-end systems - Logistics - E-tailing - E-procurement

UNIT IV   **9 Hours**
Customer relationship management and e-marketing - CRM automation - Key benefits of CRM
Business process analysis - Activity/process analysis methodology -Collection of activity/process information - Steps in building a process model

UNIT V   **9 Hours**
Activity/process-based costing - Introduction - Research - How ABC differs from traditional costing - Choice of drivers - ABC example - Process-based modeling
Business process performance improvement - Change management - Process-based accounting incorporating Six Sigma

Text Books:
Margaret May., "Business Process Management; Integration in a web-enabled environment"., Pearson Education Limited 2003

      a.   UNIT I – Chapter 1, 2
      b.   UNIT II - Chapter 3,4,5
      c.   UNIT III - Chapter 7,8,9,10
      d.   UNIT IV - Chapter 11,12
      e.   UNIT V – Chapter 13,14,15,16,17

References

Ralph F. Smith., "Business Process Management and the Balanced Scorecard; Using Processes as Strategic Drivers" John Wiley & Sons, Inc., Hoboken, New Jersey., 2007

Subject Code : P1MSE43R	SEMESTER IV	Contact Hours Per semester : 45 hrs
Credits : 3	PRODUCTION DESIGN ANALYSIS AND PRODUCTION SYSTEM	Contact Hours Per Week : 5 hrs

Objective

This course provides a practical approach to production analysis and design using a blend of traditional development methods with current technologies in production management.

Unit – 1 Introduction to production systems: **9 Hours**

Aim of production system, generalized model and types of Production systems Features compiling service organization, Life cycle approach to production management.

Unit – 2 Product development and design: **9 Hours**

New product development and process selection,stages in new product development, use of decision tree, Breakeven Analysis, Make/ buy decision, Problems for Break even Analysis Non – linearity in B.E. Analysis, selection of location among alternatives – A case of study, systematic layout planning, objectives, types, comparison and application of different types of layouts. Assembly line balancing concept and problems for maximum line efficiency.

Unit – 3 Planning for Production: **9 Hours**

Importance, objectives and types of forecasting methods, Analysis and comparison standard error of estimate.

Unit – 4: Material Requirement Planning (MRP):   **9 Hours**

Objective, dependent demand, inputs to MRP,MRP model, Production schedule, MRP logic comparison.

Unit – 5 Sequencing and scheduling: **9 Hours**

Criteria for sequencing, priority sequencing and rules, n job 2 machine, n job m machine problems.Element of monitoring and follow up

Text Books:
1. Production operations management – Buffa, Edwood, Wiley 3rd edition

Reference Books:
1. Elements of Production, planning and control – Elion Samuel A Universal Book Corporation, 1994
2. Production control: A quantitative approach – Biegel. J, Edgewood Cliffs N.J Prentice Hall , 2nd edition
3. Industrial Engineering and production management – MartandTelsang., Sultan Chand Publications 2008, 6th edition

Subject Code : P1MSE44F	SEMESTER IV	Contact Hours Per semester : 45 hrs
Credits : 3	**FINANCIAL ACCOUNTING WITH TALLY**	**Contact Hours Per Week : 5 hrs**

Objective: This course gives on-hand experience in working with software package Tally to enhance office automation. This helps to keep in pace with the actual demands in an organisation. Practical paper handled in the computer lab with practical external exam Only.

UNIT - I   9 Hours
Basic Concepts of Accounting, Financial Statements, Financial Statement Analysis, Cost Centre, Basic concepts of Inventory Tally Configuration, Data Directory & Folders configuration, Single & Multiple User, Tally Screen Components, Mouse / Keyboard Conventions & Key, Combinations, Switching between screen areas, Quitting Tally. Maintaining Company Data, Basic Company Details, Create/Alter/Select/Load/Close a Company, Chart of Accounts, Configuration.

UNIT – II   9 Hours
Create, Alter & Display Groups and Ledgers, All accounting voucher types and transactions, Create and Alter new Voucher type, Item and Account Invoice transactions, Excise Invoice, Export Invoice, Transactions using Bill-wise details. Create, Alter & Display Cost Centre and Cost Categories, Cost centre & Cost Category allocation in voucher entry, Creating Cost centre Class, Invoice entry in a Class situation, Create, Alter & Delete Foreign Currencies, Voucher entry using foreign currency.

UNIT – III   9 Hours
Create, Alter & Delete Budgets for groups, ledgers & cost centres, Defining credit limit & credit period, Display Budgets & variances. Enabling Job Costing in Tally, Master creation & configuration for Job costing, Creation of Voucher type & Voucher class for Stock Transactions.

UNIT – IV   9 Hours
Reports like balance sheet, Profit & Loss account, Ratio analysis, Trial Balance. Accounts books like cash/bank book, All ledgers, Group summary & vouchers, Sales, purchase & journal registers, Cost centre & category summary, outstanding receivables & payables. Statistics, Cash & Fund flow, Day book, List of Accounts.

UNIT – V   9 Hours
Create, Alter & Display Stock Groups and Stock Items, Stock item behaviour using costing and market valuation method. Create, Alter & Display Stock categories, Create, Alter, Display simple & compound units of measures, Stock items using alternate units, Defining standard cost & selling price, Defining Rate of duty, Defining MRP, Create, Alter & Display Godowns, Allocation of items to the Godowns, All inventory voucher types and transactions, Inventory details in accounting vouchers, Defining re-order level, Use of batch-wise details in voucher, Creating Bill of material, Cost estimation, Reports like Stock summary, Stock query, Reorder status, Purchase & Sales order summary & pending.
        Back-up & Restore, Splitting company data, Export & import of Data.

Text Book:
Tally 9 (course kit), Dr.Namrata Agrawal, Dream Tech Press

REFERENCE BOOKS :
Implementing Tally 6.3 by Nadhani; BPB Publications, ISBN: 817656494X
Kogent Learning Inc Solutions, Tally 9 In Simple Steps, Dreamtech Press
Tally 9.0 (English Edition),Computer World, Computer World, ISBN:9380010400
Vikas Gupta, Computer and Financial Accounting with Tally 9.0, Dream Tech Press

LAB LIST
1. Company Creation
2. Ledger Creation
3. Voucher Creation
   a) Receipt voucher
   b) Payment voucher
   c) Contra voucher
   d) Journal voucher
   e) Sales voucher
   f) Purchase voucher
4. View Reports
   a) Purchase Register
   b) Sales Register
   c) Journal Register
   d) Outstanding Receivable
   e) Outstanding Payable
   g) Day Book
5. Printing the Reports
   a) Multi-Accounts printing
   b) Final Accounts Printing
   c) Cheque printing
6. Create, Alter & Display Cost Centre and Cost Categories
7. Budgets
8. Master creation & configuration for Job costing
9. Reports like balance sheet, Profit & Loss account, Ratio analysis, Trial Balance, Day book
10. Create, Alter & Display Godowns, Allocation of items to the Godowns, All inventory voucher types and transactions
11. Create, Alter & Display Stock Groups and Stock Items
12. Create, Alter, Display simple & compound units of measures, Stock items using alternate units
13. Create, Alter & Display Godowns, Allocation of items to the Godowns.
14. Back-up & Restore, Splitting company data, Export & import of Data

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Course Name : Bachelor of Science

Discipline   : Mathematics

COURSE SCHEME:

Semester	Part	Subject	Hour	Credit	Int+Ext =Total	Subject Code	Revision
III	Part I	Tamil/Hindi	6	3	25+75=100	U1PT31/U1PH31	Revised
	Part II	English	6	3	25+75=100	U1PE31	Revised
	Core 5	Differential Equations	4	4	25+75=100	U1MAC31	Revised
	Allied 3	Physics/ Chemistry	4	4	25+75=100	U1PHA3X3/ U1CHA3X3	No Change/ Revised
	Allied 3 Lab	Lab: Physics/ Chemistry	2	-		-	-
	Allied 4	C programming (4+ 2hr practical)	6	4	25+75=100	U1MAA31	No Change
	SBE- 2	Applications of Differential Equations	2	2	25+75=100	U1MAS31	Revised

Semester	Part	Subject	Hour	Credit	Int+Ext =Total	Subject Code	Revision
IV	Part I	Tamil/Hindi	6	3	25+75=100	U1PT41/U1PH41	Revised
	Part II	English	6	3	25+75=100	U1PE41	
	Core 5	Dynamics	4	4	25+75=100	U1MAC41	No Change
	Allied 5	Physics/ Chemistry	4	4	25+75=100	U1PHA4X4/ U1CHA4X4	No Change/ Revised
	Allied 5 Lab	Lab: Physics/ Chemistry	2	2	40+60=100	U1PHA4PX /U1CHA4PX	Revised/ No Change
	Allied 6	Object oriented programming using C++	4	4	25+75=100	U1MAA41	No Change
	Allied 6 Lab	Lab: C and C++ Programming	2	1	40+60=100	U1MAA4P1	No Change
	SBE - 3	Transformation Techniques	2	2	25+75=100	U1MAS41	New

III – SEMESTER

Core: 5 - Differential Equations

Contact Hours per Semester: 60 hrs

Contact Hours per week: 4hrs   Subject code: UIMAC31

Credit: 4

Objectives:

- ❖ To understand how to solve the differential equations of first order and higher degree
- ❖ To understand how to solve the linear differential equations with constant coefficients and to solve simultaneous linear differential equation.
- ❖ To understand how to solve linear differential equations with variable coefficients.
- ❖ To understand how to solve the partial differential equations of the first order by differential method.
- ❖ To know and understand some special methods of solving some standard forms of partial differential equations of first order.

Unit : I (12 hours)

Introduction-Solutions of differential equations-Formation of differential equations-Equations of first order and of the first degree-Variables separables-Homogeneous equations-Non Homogeneous equations-Linear eqations- Equations of first order and Higher degree – Equations solvable for dy/dx, y and x, Clairut's Equation . (Chapter I,Chapter II:Sections1,2,3,4,5,Chapter IV : Sections 1,2,3)

Unit : II (12 hours)

Linear Equations with constant coefficient with particular integrals for e^{ax}, sinax, cosax,x^n, $e^{ax}V$ (Chapter V : Sections 1,2,3,&4)

Unit : III (12hours)

Linear Equations with variable Coefficients – Equations reducible to the linear Equation. (Chapter V: Sections 5 & 6)

Unit : IV (12 hours)

Partial Differential Equations of the first order – Classification of integrals – Formation of partial differential equations – Lagrange's Method of solving the linear equations. (Chapter XII : Sections 2,3&4)

Unit : V (12 hours)

Partial Differential Equations of the first order – Special Methods – Standard forms (i) $F(p,q) = 0$, ii) $F(x,p,q) = 0$, $F(y,p,q) = 0$, iii) $f1(x,p) = f2(y,q)$ iv) Clairaut's form (chapter XII : Sections 5.1,5.2,5.3 and 5.4)

Text Books: DIFFERENTIAL EQUATIONS AND ITS APPLICATIONS
By S. Narayanan and T.K.Manicavachagom
S. Viswanathan(Printers & Publishers), Pvt., Ltd;

Reference Books: DIFFERENTIAL EQUATIONS AND APPLICATIONS
By Dr. S. Arumugam and Thangapandi Issac
New Gamma Publishing House

Allied 4 – C Programming

Contact Hours per Semester: 90 hrs
Contact Hours per week: 6 hrs (4 hrs Theory + 2 hrs Practical)   Subject code: UIMAA31
Credit: 4

Objectives:

To motivate the students to learn about basic programming concepts. By that way, making them to become efficient in programming concepts which will be useful for them to learn other programming related concepts in future.

Unit-1 (18-hours)

Fundamentals: Character set-Identifiers & Keywords- Data Types- constants- variables-expressions- statement-symbolic constants.

Operators and expressions: Arithmetic operators- unary operators- relational and logical operators-assignment and conditional operators

Unit-2 (18-hours)

Input and Output Operations:

Introduction-Reading a character-Writing a character-Formatted Input,Output.

Decision making and Branching:

if statement-if else statement-nested if else-else if ladder- switch statement-The ?: operator-goto statement-while,do,do-while,for statements-jump in loops.

Unit-3 (18-hours)

Array:

One dimensional array-declaration-two dimensional array-multi-dimensional array-dynamic arrays-initializations.

Strings:

Declaration-Initialization of string variables-reading and writing string-arithmetic operations on strings-putting strings together-comparison-string handling functions.

Unit-4 (18-hours)

Functions:

Elements of User defined functions

Structure and Unions: Defining and processing a structure- user defined data types- structure and Pointers- passing structure to function- unions.

Unit-5 (18-hours)

Files: Opening- closing- creating- processing- Input/Output operations and Error handling during Input/Output operations on Files.

TEXT BOOK:

Programming in ansi 'C' - E.Balaguruswamy (Tata McGraw Hill)

REFRENCE:

1. C Complete Reference- Herbert Schildt
2. Let Us C - Yaswant Kanitkar

SBE – 2 - Applications of Differential Equations

Contact Hours per Semester: 30 hrs

Contact Hours per week: 2hrs   Subject code: UIMAS31

Credit: 2

Objectives:

To understand how to solve the real life problem using differential equation

To understand how to find the orthogonal trajectories of the family of curves, growth and decay problems and continuous compound interest problems.

To understand the Brachistochrone problem and Tautochronous property of cycloid.

To understand how to solve problems on simple electric circuits and falling bodies.

To understand the simple harmonic motion and simple pendulum.

To understand central forces and planeting motion.

Unit : I (6 hours)

　　　　Orthogonal Trafectories – Growth and Deccay – Continuous Compound Interest. (Sections 6.1, 6.2& 6.3)

Unit : II (6 hours)

　　　　 The Brachistochrone Problem – Tautochronous property of the cycloid.(Sections 6.4 &6.5)

Unit : III (6 hours)

　　　　 Simple Electirc Circuits – Falling Bodies (Sections 6.6&6.7)

Unit : IV (6 hours)

Simple Harmonic Motion – Simple Pendulum (Sections 6.8 &6.9)

Unit : V **(6 hours)**
   Central Forces – Planetary Motion (Sections 6.10 & 6.11)
Text Books: DIFFERENTIAL EQUATIONS AND APPLICATIONS
   By Dr.S. Arumugam and Thangapandi Issac
   New Gamma Publishing House
Reference Books: DIFFERENTIAL EQUATIONS AND ITS APPLICATIONS
   By S. Narayanan and T.K. Manicavachagom
   S. Viswanathan(Printers&Publishers), Pvt.Ltd.

IV – Semester
Dynamics

Contact Hours per Semester: 60 hrs
Contact Hours per week: 4hrs   Subject code: UIMAC41
Credit: 4
Objectives:

- Dynamic is useful in many physical and Engineering problems.
- It is also useful to study various practical problems in our daily life.
- In the study of mechanics, it is useful to distinguish between two types of quantities, called scalars and vectors. Examples of vector quantities are: Displacement, velocity, acceleration, force, magnetic and electric intensities etc.
- To know about basic concepts angle of projection, velocity of projection.
- To learn about the impact of two bodies.
- To acquire the knowledge of elasiticity.
- To know about simple harmonic motion and central forces.

Unit : I
    Kinematics-speed-velocity-distance-resolution – relative velocity-angular velocity.
Unit : II   **18 hours**
   Projectiles-Definitions – Two fundamental Principles – To show that the path of a Projectiles is a parabola – Characteristic of the motion of a projectile – A particle is projected horizontally from a point at a certain height above the ground describes a parabola – To determine when the horizontal range of the projectile is maximum, given the magnitude u of the velocity of projection – To show that, for a given initial velocity of projection there are, in general two possible directions of projections so as to obtain a given horizontal range – To find the velocity of the projectile in magnitude and direction at the end of time t – To show that the velocity at any point P of a projectile is equal in magnitude to the velocity acquired in falling freely from the directrix to the point – Given the magnitude of the velocity of projection, to show that there are two directions of projection for the particle so as to reach a given point – Range on an inclined plane – To find the greatest distance of the projectile from the inclined plane and show that is attained in half the total time of flight – To determine when the range on the inclined plane is maximum, given the magnitude u of the velocity of projection – To show that, for a given initial velocity of projection, there are, in general, two possible directions of projection so as to obtain a given range on an inclined plane.

Unit : III   **18 hours**
    Impulsive forces -Collision of elastic bodies – Fundamental Laws of Impact – Newton's Experimental Law – Impact of a smooth sphere on a fixed smooth plane – Direct impact of two smooth spheres – Loss of kinetic energy due to direct impact of two smooth

spheres – Oblique impact of two smooth spheres – Loss of kinetic energy due to oblique impact of two smooth spheres.

Unit : IV   **18 hours**

Simple harmonic motion – Simple Harmonic Motion in a Straight line – General solution of the S.H.M. equation – Composition of two Simple Harmonic Motions of the same period and in the same straight line - Composition of two Simple Harmonic Motions of the same period in two perpendicular directions – The Seconds Pendulum – Loss or gain in the number of oscillations made by a pendulum.

Unit : V   **18 hours**

Motion under the action of central forces – Differential Equation of central orbits – Velocities in a central orbit – Two-fold problems in central orbits – Given the law of force to the pole, to find the orbit – Law of the Inverse Square – Law of the Inverse Cube.

 Text Books: Dynamics

 Author: Dr.M.K..Venkataraman.(Agasthiar Publications)

   Unit I : Chapter-3.1 to 3.14

UnitII : Chapter -6.1 to 6.15

   Unit III : Chapter-8.1 to 8.8 and 7.1 to 7.4

   Unit IV : Chapter-10.1 to 10.7 and 10.15 and10.16

   UnitV : Chapter-11.1 to11.11and11.15 and 11.16

Reference Books: MECHANICS by Pro. Manichavasagampillai

IV-Semester

Allied 6 – Object Oriented Programming in C++

Contact Hours per Semester: 90 hrs

Contact Hours per week: 4hrs   Subject code: UIMAA41

Credit: 4

Objectives:

To motivate the students to learn about basic programming concepts. By that way, making them to become efficient in programming concepts which will be useful for them to learn other programming related concepts in future.

UNIT I   **18 Hours**

Principles of object oriented programming-software evolution-OOP paradigm-Basic concepts of OOP-Object Oriented Languages-Application of OOP-Introduction to C++-Tokens-Keywords-Identifiers and constants-Basic Data types-Symbolic Constants-Type Compatibility-Declaration-Scope resolution operator-Memory management operator-Manipulators-Type implicit conversion operators-Precedence and associativity-Control Structures.

UNIT II   **18 Hours**

Functions in c++-main function-Function prototyping-Call by reference-Return by reference-Inline function-Default arguments-Constant arguments-Function overloading-Classes and objects-Specifying a class-Defining member functions-Nesting of member functions-Arrays within a class-Static data members-Static member functions-Arrays of objects-Object as function arguments-Friend function-Returning object.

UNIT-III   **18 Hours**

Constructors-Parameterized   Constructors-Multiple   Constructors-Dynamic Initialization of objects-Copy constructor-Dynamic constructor-Constructing two dimensional arrays-Destructors-Defining operator overloading-Overloading unary

operators,binary operators-Overloading operators using friend function-Manipulation of strings using operators-Rules-Types conversion

UNIT-IV   **18 Hours**
　　　　Inheritance-Single Inheritance-Multilevel, Multiple, Hierarchial Inheritance-Virtual base classes-Abstract class-Constructors in derived class-Nesting of classes-Pointers to objects-this pointer-Pointers to derived class-Virtual functions-Pure virtual functions.

UNIT V   **18 Hours**
　　　　Managing console I/O Operation-Unformatted and formatted console I/O operations-Managing output with manipulators-Working with files-Classes of file stream objects-Opening and closing a file-End of file detection-File pointers and their manipulations. Error handling during file operations- Command line arguments.

TEXT BOOK:
E.Balagurusamy,Object oriented programming using c++,Tata mcgraw hill,New delhi-second edition.

UNIT I – chapter – 1.3.1-1.3.5,3.8-3.10,3.14,3.16,3.18,3.21,3.23,3.24.
UNIT II – chapter – 4.1,4.9,5.3-5.7,5.11-5.16.
UNIT III – chapter – 6,7.
UNIT IV – chapter – 8,9.
UNIT V – chapter – 10,11.1-11.6,11.9,11.10.

REFERENCE BOOK:

C++:The Complete Reference. Second Edition. Herbert Schildt. Osborne McGraw-Hill.

IV-Semester
Allied 6 – LAB: C and C++ Programming

Contact Hours per Semester: 30 hrs
Contact Hours per week: 2hrs   Subject code: U1MAA4P1
Credit: 1
Objectives:
To motivate the students to learn about basic programming concepts in a practical manner.
C PROGRAMS:
1.Write a C program to find the factorial of a given number.
2.Write a C program to find whether the given number is odd or even.
3.Write a C program to find the simple interest.
4.Write a C program to add and subtract two matrices using function.
5.Write a C program to calculate Electricity Bill.
6.Write a C program to Check whether the given year is leap year or not.
7.Write a C program to perform arithmetic operations using switch statement.
8.Write a C program to (i)Compare Two Strings (ii)Copy one String to another String.
9. Write a C program to display Mark List using Structure.
10.Write a C program to display the contents of a file.

C++ PROGRAMS:
1.Write a C++ program to find sum,average and standard deviation for a set of given numbers.

2.Write a C++ program to perform multiplication among two matrices.

3.Write a C++ program for conversion of decimal to binary number.

4.Write a C++ program to search a element in a given array.

5.Write a C++ program to perform the following stack operations: (i) push (ii) pop (iii) display.

6.Write a C++ program to sort the list of numbers in descending order.

7.Write a C++ program to illustrate multiple inheritance.

8. Write a C++ program to find the roots of a quadratic equation

9.Write a C++ program to concatenate two strings using operator overloading.

10.Write a C++ program to copy one file to another file.

SBE 3 - TRANSFORMATION TECHNIQUES

Contact Hours per Semester: 30 hrs

Contact Hours per week: 2hrs   Subject code: U1MAS41

Credit: 2

OBJECTIVES:
- To help the students to understand and apply the Laplace transform techniques.
- To help the students to understand and apply the concept of Fourier series.
- To help the students to understand the techniques to Fourier transform.

UNIT-I   **(6 hours)**

The Laplace transform – Definitions –some general theorems-simple problems.

UNIT-II   **(6 hours)**

Inverse transforms – solutions of ordinary differential equations with constant coefficients – system of differential equations (differential equations with variable coefficients not included)-simple problems.

UNIT-III   **(6 hours)**

Fourier series – even and odd functions.

UNIT-IV   **(6 hours)**

Half- range Fourier series – Change of interval-(Harmonic Analysis not included)

UNIT-V   **(6 hours)**

Fourier transforms-Properties of Fourier transform- Fourier line and cosine transform parallel identity – convolation theorem.(worked out examples only).

TEXT BOOK :

CALCULUS VOLUME III – S. NARAYANAN AND T.K. MANICKA VASAGAM PILLAY EDITION 2007

UNIT I – CHAPTER -5 SECTIONS 1,2,3,4,5.

UNIT II – CHAPTER 5 SECTIONS 6,7,8,9 (10 NOT INCLUDED)

UNIT III- CHAPTER 6 SECTIONS 1,2,3

UNIT IV- CHAPTER 6 SECTIONS 4,5,6(7,8 NOT INCLUDED)

UNIT V – CHAPTER 9 SECTIONS 10,11,12,13,14(9 NOT INCLUDED)

 REFERENCE BOOK:

1.ADVANCED CALCULUS VOL –II,ARUMUGAM AND OTHERS

2.ENGINEERING MATHEMATICS VOL III – P.KANDASAMY AND OTHERS.

Course Name : Master of Science
Discipline   : Mathematics
COURSE SCHEME:

Semester	Part	Subject	Hour	Credit	Int+Ext =Total	Subject Code	Revision
III	Core 10	Differential Geometry	6	5	25+75=100	P1MAC31	Revised
	Core 11	Topology	6	4	25+75=100	P1MAC32	Revised
	Core 12	Functional Analysis	6	4	25+75=100	P1MAC33	Revised
	Core 13	Number Theory	6	4	25+75=100	P1MAC34	No Change
	Elective 2	Stochastic Process	6	5	25+75=100	P1MAE31	New
Semester	Part	Subject	Hour	Credit	Int+Ext =Total	Subject Code	Revision
IV	Core 14	Complex Analysis	6	4	25+75=100	P1MAC41	NC
	Core 15	Numerical Analysis	6	4	25+75=100	P1MAC42	Revised
	Core 16	Classical Mechanics	6	4	25+75=100	P1MAC43	Revised
	Core 17	Field Theory	6	4	25+75=100	P1MAC44	NC
	Elective 3	Combinatorics	6	5	25+75=100	P1MAE41	NC

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III – SEMESTER
DIFFERENTIAL GEOMETRY

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Contact Hours per Semester: 90 hrs
Contact Hours per week: 6hrs   Subject code: P1MAC31
Credit: 5
TO ENABLE THE STUDENTS
- To understand the fundamental concepts in Differential Geometry.
- To establish the conditions for the contact of curves and surfaces leading to the definitions of osculating circle and osculating sphere at a point on the space curve.
- To know the concepts of fundamental theorem of space curves
- To illustrate the motion of a particular type of space curves known as Helices and to solve problems in then areas.
- To acquire and develop interest in the first fundamental form ,Local intrinsic properties of a surface and geoderic on a surface and to solve problems in these areas.

UNIT-I   **(18 hours)**
      Theory of space curves- unique parametric representation of a space curve-Arc length- tangent and obsulating plane- principal normal and binormal-curvature and torsion-

behaviour of a curve near one of its paints-the curvature and torsion of a curve as the intersection of the two surfaces- contact between curves and surfaces.

UNIT-II: (18 hours)

Osculating circle and osculating sphere- Locus of centers of spherical curvature – tangent surfaces, involutes and evolutes – Betrand curves – Spherical indicatrix – intrinsic equations of space curves –fundamental existence theorem for space curves –helices.

UNIT-III   **(18 hours)**

The first fundamental form and local intrinsic propcties of a surface. Definition of a surface – Nature of points on a surface – represeutation of a surface curves in surface – Tangent plane and surface normal the general surface of revolution helicoids

UNIT-IV   **(18 hours)**

Metric in a surface – The first fundamental form – Direction coefficients on a surface –Farrilies of curves – orthogonal trajectories – double family curves - Isometric correspond – dence-Intrinsic propcities.

UNIT-V   **(18 hours)**

Geodesics and their differtial equation – canonical goederic equation – geoderrics on surface of revolution – normal property of goederics- differentional equation geoderics using normal property.

TEXT BOOK Differential geometry –D.Somasundaram, Narosa publication 2005

REFERENCE BOOK An introduction to Differential geometry –T.G.Wilimore- Oxford university press (1983)

 Chapter 1 Section 1-2 to 1-10.
Chapter 1 Section 1.11 to 1-18.
Chapter 2 Section 2.2 to 2.8.
Chapter 2 Section 2.9 to 2.15.
Chapter 3 Section 3.2 to 3.6.

III - Semester
TOPOLOGY

Contact Hours per Semester: 90 hrs
Contact Hours per week: 6hrs   Subject code: P1MAC32
Credit: 4

OBJECTIVES
- To enable the students to understand topological spaces
- To enable the students to understand the concept of continuons functions
- To enable the students to know about connected spaces
- To enable the students to know about compact spaces
- To study countability and separations axioms

UNIT-I   **(18 hours)**

Topological spaces- Basis for a topology- the order topology-the product to topology -the sub space topology- closed sets and limit points

UNIT-II   **(18 hours)**

Continuous functions-the product topology- the metric topology-the metric topology (cont)

UNIT-III   **(18 hours)**

Connected spaces- connected sets in the real line-component and path components

UNIT-IV   **(18 hours)**

Compact spaces- compact sets in the real line-limit point-compactness

UNIT-V   **(18 hours)**

The countability axioms- the separation axioms-the Urysohn lemma-the Urysohn metrization theorem- .

TEST BOOK:

TOPOLOGY-A.FIRSR COURSE by JAMES R.MUNKRES (P.H.I) 3rd EDITION

REFERENCE BOOKS:
1) TOPOLOGY, DUGUNDJI, J.
2) GENERAL TOPOLOGY,K ELLY,J.L

UNIT-1 SECTIONS 12,13,14,15,16,17
UNIT-2 SECTIONS 18,19,20,21
UNIT-3 SECTIONS 23,24,25
UNIT-4 SECTIONS 27,28,29
UNIT-5 SECTIONS 31,32,33,34

III – SEMESTER
FUNCTIONAL ANALYSIS

Contact Hours per Semester: 90 hrs
Contact Hours per week: 6hrs   Subject code: P1MAC33
Credit: 4

Objectives:
To enable the students to
(i)   Understand the basic concepts of Normed linear Spaces and continuity of linear maps
(ii)   Know the two important theorems on Hahn- Banach and banach spaces
(iii) Understand the three fundamental theorems in functional analysis and how to use this theorems in problems
(v) Know the concepts of spectral, weak, weak*,

Unit : I   **(18 hours)**
Normed Linear spaces – Continuity of linear maps(chapter 2: section 5,6)
Unit: II   **(18 hours)**
Hahn- Banach theorems ,Banach spaces (Chapter 2: section 7,8)
Unit : III   **(18 hours)**
Uniform bounedness principle-Closed graph theorems and Open mapping theorem (chapter 3 : section 9(pages 138 to 144 only),10,11).
Unit : IV   **(18 hours)**
Spectrum of a bounded oprater- Duals and Transposes of L^p ([a,b]) and C([a,b]) (chapter 3: section 12,chepter 4: section 13 pages (235 to 248 only),140
Unit : V   **(18 hours)**
Weak and weak* convergence- Reflexity (chapter 4:section 15,16)
Text Books:
FUNCTIONAL ANALYSIS, Second edition, By B.V.LIMAYE
NEW AGE INTERNATION (P) Ltd, Publishers , New Delhi,2002
Reference Books:
1. Simmons, G.F., "Introduction to topology and Modern Analysis", Tata McGraw Hill Publishing Co. Ltd., New Delhi, 2004.
2. A.E. Taylor and D.C.Lay: Introduction to Functional Analysis, 2nd edition Wiley, New York, 1980.

VIRUDHUNAGAR HINDU NADARS' SENTHIKUMARA NADAR COLLEGE
(An Autonomous Institution Affiliated to Madurai Kamaraj University)
[Re-accredited with 'A' Grade by NAAC]
Virudhunagar – 626 001

III – SEMESTER
NUMBER THEORY

Contact Hours per Semester: 90 hrs
Contact Hours per week: 6hrs   Subject code: P1MAC34
Credit: 4

Objectives:

- By knowing many basic and advanced theorems in numbers , a student can create and develop many wonders hidden in numbers.
- By studying many arithmetical functions and operations ,he can have an idea of doing research by connecting number theory with other branches of mathematics.

Unit : I   **(18 hours)**

Divisibility_ greatest common divisor_ prime numbers_ The fundamental theorem of arithmetic _The series of reciprocals of the primes _The Euclidean algorithm _ The greatest common divisor of more than two numbers _The Mobius function_ The Euler totient function _A relation connecting Mobius and Euler totient _A product formula for Mobius function

Unit : II   **(18 hours)**

The Dirichlet product of arithmetical functions _ Dirichlet inverses and the Mobius inversion formula _ The Mangoldt function _ Multiplicative functions _ Multiplicative functions and Dirichlet multiplication _ The inverse of a completely Multiplicative functions_ Liouville's function _ The divisor functions_ generalized convolutions _Formal power series _ The Bell series of an arithmetical function _Bell series and Dirichlet multiplication _ Derivatives of arithmetical functions _ The Selberg identity

Unit : III   **(18 hours)**

The big oh notation,Asymptotic equality of functions _ Euler's summation formula _ some elementary asymptotic formulas _The average order of d(n) _ The average order of the divisor functions_ the average order of Euler totient function _ An application to the distribution of lattice points visible from the origin _the average order of Mobius function and Mangoldt function_The partial sums of a Dirichlet product _Applications to Mobius functions and Mangoldt function_ Another identity for the partial sum of a Dirichlet product _ Chebyshev's functions.

Unit : IV   **(18 hours)**

Definition and basic properties of congruences _Residue classes amd complete residue systems_ linear congruences _Reduced residue systems and the Euler-Fermat theorem-Polynomial congruences_ Modulo of Lagrange's theorem _ Applications of Lagrange's theorem _ simultaneous linear congruences _The Chinese remainder theorem _ Applications of the Chinese remainder theorem _ Polynomial congruences with prime power moduli

Unit : V   **(18 hours)**

Quadratic residues _ Legendre's symbol and its properties _ Evaluation of (-1/p) and (2/p) _ Gauss lemma _ The quadratic reciprocity law _The Applications of the reciprocity law_ The Jacobi symbol _ Applications to Diophantine equations.

Text Books:

Introduction to Analytic Number theory by T.M.Apostol

CONTENTS:

Unit :-I

Chapter :1 – Section :1.1 to 1.8
Chapter :2 – Section :2.1 to 2.5

Unit :-II

Chapter :2 – Section :2.6 to 2.19

Unit :-III

Chapter :3 – Section :3.1 to 3.12

Chapter :4 – Section :4.1 and 4.2

Unit :-IV

Chapter :5 – Section :5.1 to 5.9

Unit :-V

Chapter :9 – Section :9.1 to 9.8

REFERENCE BOOKS:

1.Beginning Number Theory by Neville Robbins

2.Number Theory by Burton

III – SEMESTER
STOCHASTIC PROCESS

Contact Hours per Semester: 90 hrs

Contact Hours per week: 6hrs   Subject code: P1MAE31

Credit: 5

Objectives

❖ To introduce the basic concepts on stochastic process.

❖ To motivate preliminary definitions in Markov Chain, Markov, Process, Poisson Process etc.

❖ To enrich the knowledge of students in Queueing theory and inventory control.

❖ Some concepts on Wiener process.

❖ To practice the students for some real life Mathematical Models and finding relevant outputs.

UNIT:I   **(18 hours)**

Definitions and Transition probabilties _ A Few More Examples _ Classification of States_ Limit Theroems for Markov Chains.

UNIT:II   **(18 hours)**

Stationary Distribution _ Theorems Regarding Finite Markov Chains _ Methods of Evaluation of the n-step Transition Probability

UNIT:III   **(18 hours)**

Introduction _ Renewal Equation _ Renewal Theorems _ Central Limit Theorem for Renewal Theory

UNIT:IV   **(18 hours)**

Axiomatic Definition and Transition Function _ Differentiability of Transition Function_ Kolmogorov Differential Difference Equation _ Infinitesimal Generators and Examples _   Birth and Death Processes _ The Yule Process

UNIT:V   **(18 hours)**

Different Definitions and Their Equivalence _ Poisson Process and Renewal Theory _ Properties of Poisson process _ Characterization of Poisson Process _ Generalization of Poisson Process.

Text Book:

Introduction to Stochastic Process by A.K.Basu, Narosa publishers,2005.

REFERENCE BOOK:

Stochastic Process by Medhi

IV – SEMESTER
COMPLEX ANALYSIS

Contact Hours per Semester: 90 hrs

Contact Hours per week: 6hrs   Subject code: P1MAC41

Credit: 4

Objectives

To enable the students to

❖ Understand the concepts of sterographic Projection and linear transformations

❖ Be familiar with the different forms of cauchy's Theorem

❖ Develop skills to analyze local properties of analytic functions such as zeros and poles

❖ Know the basic properties of Harmonic function

❖ Expand various functions functions in power series

UNIT-1   **(18 hours)**

The algebra of complex number, the geometric representation of complex number (chapter 1: Section 1,2)

UNIT-2   **(18 hours)**

Introduction to the concept of analysis function, Elementary theory of power series The exponential and trigonometric function (chapter 2: Section 1,2,3)

UNIT-3   **(18 hours)**

Conformality, linear transformation, Elementary conformal mappings (chapter 3: Section 2,3(3.1 to 3.3 only),Section 4)

Unit-4   **(18 hours)**

Fundamental theorem Cauchy's integral formula , local properties of analytical functions, (chapter 4: Section 1,2,3)

UNIT-5   **(18 hours)**

The general form of Cauchy's theorem The calculus of residues Harmonic function, Power series expansions (chapter 4: section 4(4.1 to 4.5 only),5,6 and chapter 5:Section 1)

TEXT BOOK

COMPLEX ANALYSIS BY L.V.AHLFORS (III EDITION) McGRAW HILL ISE,1981

REFERENCE BOOKS:

1.Complex Analysis by Ponnusamy

2.Complex Analysis by V.Karunakaran

IV – SEMESTER
NUMERICAL ANALYSIS

Contact Hours per Semester: 90 hrs

Contact Hours per week: 6hrs   Subject code: P1MAC42

Credit: 4

Objectives:

❖ To know about the direct and indirect methods for finding the roots of transcendentral and polynomial equations

❖ To know various methods for finding eigen values and eigen vectors.

❖ To discuss the single step and multistep methods for solving first order initial value problems.

❖ To discuss several methods of differentiation

❖ To discuss several methods of integration

Unit: I **(18 hours)**

Bisection method – Iteration Methods based on First degree Equation - Iteration Methods based on Second degree Equation – Rate of convergence

Unit : II **(18 hours)**

Introduction – Direct Methods – Iteration methods- Eigen value and Eigen vectors

Unit : III **(18 hours)**

Jacobi method for symmetric matrices – Givens Methods for symmetric matrices – Householder's Method for symmetric matrices – Rutishauser Method for Arbitary Matrices-Power Method- Inverse Power method

Unit : IV **(18 hours)**

Introduction – Lagrange and Newton interpolation-Finite difference operator-Interpolation polynomials using finite differences-Hermite interpolations.

Unit : V **(18 hours)**

Introduction-Numerical Differentiation-Extrapolation Methods-Partial Differentiations –Numerical Integration- Methods Based on interpolation- Composite integration methods-Romberg Integration-Double Integration

Text Book:

NUMERICAL METHODS for Scientific and Engineering Computation
Revised fourth Edition –M.K.JAIN, S.R.K.IYENGAR, R.K.JAIN

UNIT 1: SECTION - 2.2, 2.3, 2.4, 2.5
UNIT II: SECTION – 3.1, 3.2, 3.4, 3.5
UNIT III: SECTION- 3.7 to 3.12
UNIT IV: SECTION – 4.1 to 4.5
UNIT V: SECTION -5.1, 5.2, 5.4, 5.5, 5.6, 5.7, 5.9, 5.10, 5.11

Reference Books:

1. Hilderbrond, F-B Introduction of Numerical Analysis. McGraw-Hill New York, 1953
2. Sastory, Numerical Methods
3. S. Arumugom, Numerical methods Scitech, publications, 2001

IV – SEMESTER
CLASSICAL MECHANICS

Contact Hours per Semester: 90 hrs
Contact Hours per week: 6hrs   Subject code: P1MAC43
Credit: 4

OBJECTIVES:

- To enable the students to understand the concept of generalized co-ordinates and lagrange's equation for holonomic system.
- To enable the students to understand the different variational principles.
- To derive the equation of motion.
- To enable the students to deal with the canonical transformation.

UNIT-I **(18 hours)**

D'Alenbert's principle and Lagrange's equations.

UNIT-II **(18 hours)**

Variational Principle and Lagrange's equations.

UNIT-III **(18 hours)**

Equations of Motions of Rigid body.

UNIT-IV   **(18 hours)**
Hamilton's Equations of Motions.
UNIT-V   **(18 hours)**
Canonical Transformations.

TEXT BOOK:
  CLASSICAL MECHANICS   by C.R.MONDAL
                              PH1,NEW DELHI:2005
UNIT-I : Chapter-I   UNIT-II : Chapter-II
UNIT-III: Chapter-III   UNIT-IV: Chapter-IV
UNIT-V: Chapter-V
                (Exercise Problems are excluded)
REFERENCE BOOK :
  1.CLASSICAL MECHANICS   by Goldstein
2. MECHANICS by Synge and Giriffith

IV – SEMESTER
FIELD THEORY

Contact Hours per Semester: 90 hrs
Contact Hours per week: 6hrs   Subject code: P1MAC44
Credit: 4
Objectives:
        To study the important applications of fields in the theory of numbers.
        To study the relation of one field to another.
Unit : I   **- 18 hours**
        Extension fields-The transcendence of e.
Unit : II   **- 18 hours**
        Roots of polynomials-construction with straightedge and compass.
Unit : III   **- 18 hours**
        More about roots-The elements of Galois Theory.
Unit : IV   **- 18 hours**
        Solvability by radicals-Galois Groups over the rationals.
Unit : V   **- 18 hours**
        Finite fields-wedderburn's theorem on finite division rings.
Text Books:
     Topics in Algebra,Second Edition by I.N.Herstein.
REFERENCE BOOK:
 1.Modern Algebra by A.R.Vashistha
2.Modern Algebra by Surjeetsngh

IV – SEMESTER
COMBINATORIAL

Contact Hours per Semester: 90 hrs

Contact Hours per week: 6hrs   Subject code: P1MAE41

Credit: 5

Objectives:

To enable the students to

(iii)   Understand the basic concepts of permutations and combinations

(iv)   Be familiar with generating functions and techniques

(iii)   Develop skills to obtain solutions of recurrence relations by generating functions

(iv)   Solve problems using the principle of inclusion and exclusion

(v)   know the applications of Polya's fundamental theorem in Combinato

Unit : I PERMUTATION AND COMBINATION   (18 hours)

r-permutations and r-combinations with and without Repetition- The rules of sums and products- Permutations-Combinations-Distributions of Distinct objects - Distributions of non-Distinct objects-Stirling's formula.

Unit : II GENERATING FUNCTIONS   (18 hours)

Generating functions for Combinations-Enumerators for Permutations- Distributions of Distinct objects into non distinct cells – Partitions of Integers-Elementary Relations.

Unit : III RECURRENCE RELATIONS   (18 hours)

Linear recurrence Relations with constant coefficients-Solutions by the technique of Generating Functions

Unit : IV THE PRINCIPLE OF INCLUSION AND EXCLUSION   (18 hours)

The general formula – Derangements – Permutations with restrictions on relative positions

Unit : V POLYA'S THEORY OF COUNTING   (18 hours)

Equivalence classes under a permutations group – Burnside theorem-Equivalence classes of functions- weights and inventories of functions-Polya's Fundamental Theorem

Text Book:

Liu.C.L..,"Introduction to Combinatorial Mathematics",MCGraw Hill Book Co..New York 1968.

Contents:

Chapter 1:Sections 1.1 to 1.7

Chapter 2:Sections 2.1 to2.5 and 2.7

Chapter 3:Sections 3.1 to 3.3

Chapter 4:Sections 4.1 to 4.5

Chapter 5:Sections 5.3 to 5.6

Reference Books:

1. Bala Krishnan,V.K.,"Combinatorics",Tata MCGraw Hill publishing Co., New Delhi,2005.

2. Daniel I.A.Cohen, "Basic Techniques of Combinatorial Theory and Applications",John Wiley and Sons., New Delhi,1978.

3. Krishnamurthy.V.," Combinatorics Theory and Applications", Affliated East West Press Pvt.Ltd.,Chennai,1985.

Course Name : **Bachelor of Science**
Discipline : **Physics**
COURSE SCHEME:

Sem	Part	Subject	Hrs	Credit	Marks Int+Ext	Total	Subject Code	Revision
III	I	Tamil III/Hindi	6	3	25+75	100	U1PT31/ U1PH31	Revised
	II	English III	6	3	25+75	100	U1PE31	Revised
	III	Core 3 Electromagnetism	4	4	25+75	100	U1PHC31	Revised
	III	Core (Major) Lab	2	-	40+60	100	-	-
	III	Allied Maths Paper 3	6	4	25+75	100	U1MAA3X3	Revised
	III	Allied Chemistry Paper 1	4	4	25+75	100	U1CHA3X1	Revised
	III	Allied Chemistry Lab	2	-	40+60	100	-	-
IV	I	Tamil IV/Hindi	6	3	25+75	100	U1PT41/ U1PH41	Revised
	II	English IV	6	3	25+75	100	U1PE41	Revised
	III	Core 4 Analog Electronics	4	4	25+75	100	U1PHC41	Revised
	III	Core (Major) Lab	2	2	40+60	100	U1PHC4P1	No Change
	III	Allied Maths Paper 4	6	4	25+75	100	U1MAA4X4	Revised
	III	Allied Chemistry Paper 2	4	4	25+75	100	U1CHA4X2	Revised
	III	Allied Chemistry Lab	2	2	40+60	100	U1CHA4PX	No Change

SYLLABUS FOR EACH PAPER:

COURSE : II B.Sc. PHYSICS SEMESTER : III	ELECTROMAGNETISM CORE PAPER 3	Hours : 4 Credit : 4

Subject Code: U1PHC31

Contact Hours per Semester: 60 hrs

Objectives

- To study about laws of induction and methods to find self and mutual inductance of coils.
- To study about the nature of transient currents in LR and CR circuits.
- To learn about the current variation in series and parallel resonance circuits.
- To learn about the properties of magnetic materials.

- To impart knowledge about importance of Maxwell's equations in electromagnetism.

UNIT - I   (12hours)

Electromagnetic induction - Introduction – Faraday's Laws of electromagnetic induction - Faraday's law in vector form – Self inductance – Energy stored in an inductance – Self inductance of a long solenoid – Experiment to determine Self inductance by Rayleigh's method with theory – Mutual inductance – Mutual inductance between two coaxial solenoids – Determination of mutual inductance by B.G – Coefficient of coupling – Eddy currents.

UNIT – II   (12 hours)

Transient currents – Growth of current in a circuit containing a resistance and inductance – Decay of current in LR circuit – Growth and decay of charge in CR circuit – Determination of high resistance by leakage method by using B.G – Growth and decay of charge in a LCR circuit.

UNIT – III   (12 hours)

Alternating current - Introduction – Mean value of alternating e.m.f – R.M.S value of the alternating current and voltage – Alternating current applied to LR, CR and LCR circuit – Series resonance circuit – Parallel resonance circuit – Power in ac circuit containing L, C & R – Wattless current – Q factor – Choke coil - Fuses – types of fuse –Rewirable type fuse – cartridge fuse – Circuit breaker – The relay – Skin effect – A.C bridges – Maxwell's bridge – Anderson's bridge and Owen's bridge.

UNIT – IV   (12 hours)

Properties of magnetic materials – Definition of B, H, M and magnetic susceptibility – magnetic materials & magnetization – properties of dia, para, ferromagnetic materials – Hysterisis – Workdone in taking unit volume of magnetic materials through complete cycle of magnetization – Area of Hysterisis loop – Ballistic method – Ferromagnets, ferrimagnets and determination of susceptibility – Guoy's method.

UNIT – V   (12 hours)

Maxwell's Equations and Electromagnetic waves – Derivation of Maxwell's Equations – types of currents – Displacement current – Significance of Displacement current – Maxwell's Equations in material media and free space – Electromagnetic waves in free space – Electromagnetic waves in isotropic non conducting media.

Book for study

Electromagnetism by R.Murugeshan (2008).

Unit I 1.1 – 1.10
Unit II 2.1 – 2.6
Unit III 3.1 – 3.17
Unit IV 4.1 – 4.7, 4.10 - 4.15
Unit V 5.1 – 5.8

Reference Books

1. Electricity and Magnetism – Narayanamoorthy and Nagarathinam. 2nd Revised Edition, National Publishing & Co.
2. Electricity and Magnetism – Tiwari, K.K.S Chand and Co, 2nd Edition (2002).
3. Electricity and Magnetism – Brijlal and Subramanyam.
4. Electricity and Magnetism – Sehgal, Chopra and Sehgal. Sultan S. Chand & Sons.

COURSE : II B.Sc. PHYSICS SEMESTER : IV	**ANALOG ELECTRONICS** **CORE PAPER 4**	Hours : 4 Credit : 4

Subject Code : U1PHC41

Contact Hours per Semester: 60 hrs

Objectives

- To study about two port network parameters.
- To get knowledge about Transistor biasing and methods.
- To learn about performance of transistor amplifiers and op -amps.
- To learn about performance of oscillators and its types.
- To impart knowledge about techniques used in communication.

UNIT – I   (12 hours)

Electrical Networks – Thevenin's theorem – Nortan's theorem – Two port network parameters analysis – 'h' parameter only – Filter circuits – General theory – Low pass, high pass, band pass and band elimination filters.

UNIT – II   (12 hours)

Transistor – Introduction – Transistor biasing – Types of configuration (CE, CB, CC)– current amplification factor – relation between α, β, and γ – AC and DC load line and operating point – Stability factor – Biasing circuits – Methods of transistor biasing – fixed bias or base bias – emitter feedback bias – collector feedback bias – voltage divider bias – FET characteristic.

UNIT – III   (12 hours)

Small signal CE amplifier – Calculation of voltage gain, current gain and power gain – input and output impedance using h parameter – frequency response of amplifier – Single stage amplifier – push pull amplifier – op-amp characteristics – application as adder, subtractor – integrator and differentiator.

UNIT – IV   (12 hours)

Feedback amplifiers – Introduction – Basic concept of feedback – positive and negative feedback – Barkhausen's criterion – Transistor oscillators: Inroduction – classification of oscillators- Hartley, Colpitt and phase shift oscillator with Mathematical analysis.

UNIT – V   (12 hours)

Modulation – Types of modulation – amplitude modulation – modulated power output – Modulation index – frequency modulation(qualitative) – digital modulation(qualitative) – block diagram of AM & FM transmitters.

Book for study

1. Elements of Solid State Electronics by Ambrose and Vincent Devaraj. Indira Publications (1994).
   Unit I: Chapter 2, Sections 2.7 - 2.10
2. Electronic Devices and Circuits by Salivahanan and Sureshkumar.
   Tata Mc Graw Hill (2008).
   Unit II: Chapter 6, Sections 6.1 - 6.5
                Chapter 7, Sections 7.1 - 7.4
   Unit IV: Chapter 14, Sections 14.1 - 14.4
                 Chapter 15, Sections 15.1 - 15.6, 15.11
3. Basic Electronic and Applied Electronics by Jose Robin and Ubaldraj.
   Unit III: Chapter 2, and 4

<u>Unit V:</u> Chapter 3

Reference Books
1. Basic Electronics – J.J. Brophy. 4th Edition Mc Graw Hill, (1993).
2. Electronic Devices - Malvino.

| COURSE : II B.Sc. PHYSICS | **Core (Major) Lab 2** | Hours : 2 |
| | | Credit : 2 |

Subject Code: U1PHC4P1

Contact Hours per year: 60 hrs
INTERNAL: 40   **EXTERNAL: 60**

1. Spectrometer Grating – N and λ.
2. Spectrometer – i-d curve.
3. Spectrometer – dispersive power of a prism.
4. Spectrometer – dispersive power of a grating.
5. Air wedge – Thickness of wire.
6. Newton's rings – Radius and wavelength.
7. Desauty's Bridge – C1/C2
8. Owens Bridge – C1/C2.
9. Potentiometer – Temp. Coefficient.
10. Potentiometer – Comparison of EMF's
11. Table Galvanometer – Figure of merit.
12. Spot galvanometer – Charge sensitiveness.
13. B.G – Comparison of EMF's.
14. B.G – Comparison of Capacitance.
15. Determination of M and B_H – Tan C method.
16. Determination of M & B_H – Axial method.

(External practical examination will be held at the end of the academic year)

COURSE : ALLIED PHYSICS SEMESTER : III	**ELECTRICITY & ELECTRONICS**	Hours : 4 Credit : 4

Subject Code: U1PHA3X3

Contact Hours per Semester: 60 hrs

Objectives

- To understand the fundamentals of electrostatics and principles of Capacitors
- To get basic knowledge about electrical networks
- To study the basics of electronics
- To get the basic knowledge about digital electronics

UNIT – I (12 hours)

Gauss's law – Proof – Applications – Field due to a charged sphere and an infinite plane sheet – Field near a charged conducting cylinder – Coulomb's theorem – Electric potential – Relation between potential and field – Capacitors – Expression for capacity of parallel plate, spherical (outer sphere earthed) and cylindrical capacitors – Energy of charged capacitor – Loss of energy due to sharing of charges.

UNIT – II (12 hours)

Kirchoff's laws – Application of Wheatstone's network – Sensitveness of bridge – Carey Foster's bridge – measurement of resistance and temperature coefficient of resistance – Principle of potentiometer – Calibration of ammeter and voltmeter (low range and high range) – measurement of resistance using potentiometer.

UNIT – III (12 hours)

Torque on a current loop – Mirror galvanometer – dead beat and ballistic – current sensitiveness – B.G theory – damping correction – expression for charge sensitiveness – comparison of e.m.f's and comparison of capacitors.

Electromotive force generated in a coil rotating in a uniform magnetic field – R.M.S and mean value of alternating current – LCR circuit – impedances – Series and Parallel resonant circuits – power factor – wattles current – choke.

UNIT – IV (12 hours)

Junction diodes – Forward and reverse bias – Diode characteristics – Types of diodes (LED and Zener) – Bridge rectifier using junction diodes – π filter – Transistor characteristics (CE mode only) – biasing and action of a single stage transistor (CE) amplifier – frequency response of Hartley oscillator – Modulation (qualitative study) – Op-amp and its characteristics – Virtual earth – Voltage amplifier in inverting mode – Op-amp as adder and subtractor.

UNIT – V (12 hours)

Binary number system – reason for using binary numbers – binary to decimal and decimal to binary conversions – addition and subtraction of binary numbers – Logic circuits – Boolean algebra – De Morgan's theorem – OR, AND, NOT, NOR & NAND gates – NOR & NAND gates as universal building blocks – Ex-OR gate.

Book for study

Electricity and Electronics by R.Murugeshan.

Reference Books

1. Solid State Electronics – B.L.Theraja, S. Chand, (2003).
2. Electricity and Magnetism – Brijlal and Subramanyam. S Chand, (2007).

COURSE : ALLIED PHYSICS SEMESTER : IV	**OPTICS, SPECTROSCOPY & MODERN PHYSICS**	Hours : 4 Credit : 4

Subject Code: U1PHA4X4

Contact Hours per Semester: 60 hrs

OPTICS, SPECTROSCOPY & MODERN PHYSICS

Objectives
- To understand the basics of geometrical and physical optics
- To study the different technique in spectroscopy and photoelectricity
- To get basic knowledge about quantum physics and relativity

UNIT – I   **(12 hours)**

Deviation produced by thin lens – Focal length of two thin lenses in and out of contact – Cardinal points – Refraction through a thin prism – Dispersion – Dispersive power – Combination of thin prisms to produce (a) deviation without dispersion and (b) dispersion without deviation – Direct vision spectroscope – Chromatic aberrationin lenses and its removal – Spherical aberration in lenses and its removal – Aplanatic lenses – Oil immersion objective – Theory of primary and secondary rainbows.

UNIT – II   **(12 hours)**

Interference in thin films – Airwedge – Newton's rings (Refected beam only) – Determination of wavelength – Jamin's interferometer – Principle and use.

Diffraction – Theory of plane transmission grating (Normal incidence only) – Experiment to determine wavelength.

UNIT – III   **(12 hours)**

Double refraction – Nicol prism, constructions, action and uses – QWP and HWP – Optical activity (no theory) – Biot's laws – Specific rotatory power – Half shade polarimeter – Determination of specific rotatory power – Fibre optics – Light propagation in fibres – Fibre optic communication systems.

UNIT – IV   **(12 hours)**

Infrared radiation – production, properties and uses – Ultraviolet radiation sources, properties and uses – Quantum theory – Planck's quantum thory – Raman effect – simple theory experimental study (Wood's apparatus) – Applications – Photoelectricity – Laws of photoelectricity – Einstein equations – Photo cells and their uses – Photo emissive, photo conductive and photo voltaic cells.

UNIT – V   **(12 hours)**

De Broglie's theory - electron diffraction – G.P.Thomson experiment – Michelson Morley experiment – Significance of negative results – Postulates of special theory of relativity – Lorentz transformation equations (no derivation) – Length contaction – Time dilation – Variation of mass with velocity – Mass-energy relation(simple derivation).

Book for study
1. Optics, Spectroscopy and Modern Physics by R.Murugeshan.

Reference Books
1. A Text Book of Optics by Brijlal and N.Subramanyam S.Chand, (2002).

COURSE : ALLIED PHYSICS	**ALLIED PHYSICS PRACTICAL –II**	Hours : 2
		Credit : 2

Subject Code: U1PHA4PX

Contact Hours per Semester: 60 hrs
INTERNAL: 40   **EXTERNAL: 60**

1. Spectrometer – Grating (Normal incidence).

2. Spectrometer – Dispersive power of the prism.

3. Newton's rings.

4. Air wedge – Thickness of insulation.

5. Series resonance.

6. Parallel resonance.

7. Comparison of Capacitance – Desauty's Bridge (AC method)

8. Logic gates – AND, OR, NOT using discrete components.

9. Logic gates – NAND, NOR using discrete components.

10. Bridge rectifier.

11. Zener diode – Characteristics.

12. Transistor – Static characteristics (CE mode).

13. Single stage transistor amplifier.

14. Hartley oscillator.

Course Name : **Master of Science**
Discipline : Physics
COURSE SCHEME:

Sem	Part	Subject	Hrs	Credit	Marks Int+Ext	Total	Subject Code	Revision
III	III	Core 7: Solid State Physics I	6	4	25+75	100	P1PHC31	No Change
	III	Core 8 :Quantum Mechanics - I	6	4	25+75	100	P1PHC32	No Change
	III	Core 9 :Nuclear and Particle Physics	6	4	25+75	100	P1PHC33	Revised
	III	Major Elective: Fiber Optic Communication	6	5	25+75	100	P1PHE31	Revised
	III	Core Lab3: Digital Electronics & General Physics	6	5	40+60	100	P1PHC3P1	No Change
IV	III	Core10 :Solid State Physics II	6	4	25+75	100	P1PHC41	No Change
	III	Core11 :Molecular Spectroscopy	6	4	25+75	100	P1PHC42	Revised
	III	Core12 :Quantum Mechanics - II	6	4	25+75	100	P1PHC43	No Change
	III	Major Elective : Nanophysics	6	5	25+75	100	P1PHE41	Revised
	III	Core Lab 4 : Project	6	5	40+60	100	P1PH4PV	New

SYLLABUS FOR EACH PAPER:

COURSE : II M.Sc. PHYSICS SEMESTER : III	SOLID STATE PHYSICS I CORE PAPER 7	Hours : 6 Credit : 4

Subject Code : P1PHC31

Contact Hours per Semester: 90 hrs
Objectives

- To understand the structure of crystals.
- To get knowledge about the Imperfections of crystals.
- To study the mechanical, thermal & electrical Properties.
- To impart the knowledge about energy band theories and band gap in semiconductors.

Unit I: Crystal Physics **(18 hours)**

Crystal structure:– Simple Lattice translation vectors – Basis – Primitive lattice cell – 2D and 3D lattice types – Index system for crystal planes crystal structures. *Diffraction and Reciprocal lattice*: Diffraction of waves by a crystal lattice – Bragg law – Reciprocal lattice vectors – Diffraction conditions – Brillouin Zones – Structure factor – Atomic form factor. *Crystal binding*: Inert gas crystals – Ionic crystals – Covalent crystals – Metallic binding.

Unit II: Lattice Imperfections **(18 hours)**

Lattice vacancies: Point defects – Schottky defects – Frenkel defects – Diffusion in metals – Fick's law. *Colour centers*: F-Centers – Other centers in Alkali halides. *Dislocations*:

Burger vectors – Phenomenon of slip, edge and screw dislocations – Stress fields of dislocations – Low angle grain boundary

Unit III: Lattice Dynamics and Thermal Properties   (18 hours)
Lattice vibrations: Monoatomic lattices – Lattice with two atoms per primitive cell – Group and phase velocities – Quantization of lattice vibrations – Phonon momentum. *Lattice heat capacity*: Debye's theory of lattice heat capacity – Einstein's model and Debye's model of specific heat. *Thermal conductivity*: Thermal expansion – Umklapp processes.

Unit IV: Free Electron and Energy Band Theories   (18 hours)
Free electron gas: Periodic boundary conditions and free electron gas in 3D – Heat capacity of electron gas – Ohm's law – Mathiessen's rule and Umklapp process – Hall effect and Wiedmann Franz law – Nearly free electron model – *Energy bands*: Origin and the magnitude of energy gap – Bloch functions – Kronig-Penny model – *Wave equation of an electron in a periodic potential*: Restatement of Block theorem –Solution of the Central equation – Kronig-Penny model in Reciprocal space – Approximate solution near zone boundary – Number of orbitals in a band.

Unit V: Semiconductor Crystals   (18 hours)
Band gap: Band gap in semiconductors. *Equation of motion*: Physical derivation – Holes – Effective mass – Physical interpretation of effective mass – Effective masses in semiconductors – Intrinsic career concentration – Intrinsic mobility – Impurity conductivity – Donor and acceptor states. *Thermoelectric effect*: Thermal ionization of donors and acceptors – Thermoelectric effects – Semimetals.

Book for Study:
1. C. Kittel, 1996, Introduction to Solid State Physics, 7th Edition, Wiley, New York.
Unit I: Chapters 1, 2 & 3
Unit II: Chapters 18 & 20
Unit III: Chapters 4 & 5
Unit IV: Chapters 6 & 7
Unit V: Chapters 8

Books for Reference:
1. J.P. Srivastava, 2006, Elements of Solid State Physics, PHI Learning Pvt. Ltd., New Delhi.
2. S.O. Pillai, 1997, Solid State Physics, New Age International, New Delhi.
3. N.W. Aschroft and N.D. Mermin, Solid State Physics, Rhinehart and Winton, New York.
4. A.J. Dekker, Solid State Physics, Macmillan India, New Delhi.
5. H. Ibach and H. Luth, 2003, Solid State Physics, Springer (India), New Delhi.
6. S.O. Pillai, 1994, Problems and Solutions in Solid State Physics, New Age International, New Delhi.

COURSE : II M.Sc. PHYSICS SEMESTER : III	QUANTUM MECHANICS I CORE PAPER 8	Hours : 6 Credit : 4

Subject Code : P1PHC32

Contact Hours per Semester: 90 hrs
Objectives

- To understand the necessary of new field Quantum Mechanics.
- To get knowledge about the wave equation of particle and significance of wave function.
- To study the fundamental postulates of Quantum Mechanics and its applications.
- To impart the knowledge about angular momentum operator, ladder operators.
- To develop time independent perturbation theory and apply this theory to specific problems.

UNIT -1 (18 hours)

Inadequacy of classical concepts; Black body radiation ; Planck's quantum hypothesis - Specific heats of solids - de Broglie hypothesis - The motion of a free wave packet - Uncertainties introduced in the process of measurement - Diffraction phenomena ; interpretation of the wave packet dualism - Complementarities - The Formulation of quantum mechanics.

UNIT – II (18 hours)

Schrödinger equation and stationary states: A free particle in one dimension -generalization to three dimension - The operator correspondence and the Schrödinger equation for a particle subject to forces'- Normalization and Probability Interpretation -Non-normalizable wave function and box normalization - Conservation of probability -Expectation values; Ehrenfest's Theorem - Admissibility conditions on the wave functions - Stationary states; The time independent Schrödinger equation - A particle in a square well potential - Bound states in a square well (E<0) - The square well: Non localized states (E>0) Square Potential Barrier,

UNIT – III (18 hours)

The fundamental postulates of wave mechanics - The adjoint of an operator and self adjointness - The eigenvalue problem; degeneracy - Eigen values and eigenfunctions of self adjoint operators - Dirac Delta function - Observable : Completeness and Normalization of eigenfunctions - Closure - Physical interpretation of eigen functions, eigen values and expansion coefficients - Momentum eigen functions Wave function in momentum space - The Uncertainty Principle - States with minimum value for Uncertainty product - Commuting Observable; Removal of Degeneracy - Evolution of system with time; Constants of motion - Non-interacting and interacting system - Systems of identical Particles.

UNIT –IV (18 hours)

Exactly soluble Eigen value problem: The Schrodinger Equation and energy eigen values - The Energy Eigen functions, properties *of* Stationary states. The abstract operator method-The angular momentum operators The eigen value equation L separation of variables admissibility conditions on solutions; eigen values - The eigen functions; spherical harmonics physical interpretation - Parity Angular Momentum in stationary sets *of* systems with spherical symmetry - Solution in the interior region solution in the exterior region and Matching - Solution of the Radial equation: Energy levels -Stationary state wave functions discussion of bound states.

UNIT – V (18 hours)

Approximation methods for stationary states: Equations in various orders of Perturbation theory — The non degenerate case - The degenerate case - Removal of degeneracy - The effect of an electric field on the energy level of an atom (Stark effect) Two electron atoms - Upper bound on ground state energy - Application to excited states Trial function linear in variational parameters - The Hydrogen molecule - Exchange interaction - The one dimensional Schrödinger equation - The Bohr - Sommerfeld Quantum Condition.

Text Books for study:

A Text book of Quantum Mechanics - P.M.Mathews & K.Venkatesan - TMH

Pub.Com.Ltd., New Delhi (2010)- II edition.
Unit I: Chap. (1) Sees. 1.3,1.4, 1.13-1.15, 1.17- 1.19.
Unit - II: Chap. (2) Sees. 2.1 - 2.13.
Unit-Ill: Chap. (3) Sees. 3.2- 3.16.
Unit IV: Chap. (4) 4.1- 4.17.
Unit- V: Chap. (5) Sees. 5.1 - 5.12.

Books for reference:

1. *Quantum Mechanics - L.I. Schiff- III Edition*
2. *Quantum Mechanics - E. Merzbacher*
3. *Quantum Mechanics - Ghatak and Loganathan*
4. *Quantum Mechanics - A.S. Davydov*

COURSE : II M.Sc. PHYSICS SEMESTER : III	**NUCLEAR AND PARTICLE PHYSICS CORE PAPER 9**	Hours : 6 Credit :4

Subject Code : P1PHC33

Contact Hours per Semester: 90 hrs
Objectives

- To understand the Nuclear forces.
- To study Nuclear models.
- To learn Nuclear Reactions.
- To impart the knowledge of Nuclear fission and fusion.
- To study the elementary particles

Unit –I   **(18 hours)**
        Nuclear Forces : Introduction – Deuteron – Neutron-Proton scattering at low energies – Shape independent effective range theory in n-p scattering – Proton-Proton scattering at low energies – Effective range theory of p-p scattering – Neutron-Neutron scattering – Non central forces – Saturation of nuclear forces – High energy n-p and p-p scattering – polarization and scattering parameters – Meson theory of exchange forces.

Unit – II   **(18 hours)**
        Nuclear Models : Introduction – Fermi gas model – Liquid drop model – Shell model – Collective nuclear model – Unified model – Super conductivity model.

Unit – III   **(18 hours)**
        Nuclear Reactions : Types of nuclear reactions – Conservation laws – Nuclear reaction kinematics – Nuclear Transmutations – Nuclear cross section – Classical analysis of cross section – Partial wave analysis of reaction cross section – Thick target yield – Requirement for a reaction – Reaction mechanism – General features of reaction cross sections – Inverse reaction – Compound nucleus – Compound nucleus reactions – Disintegration of a compound nucleus – Continuum theory of nuclear reaction – Breit Wigner dispersion formula – Optical model – Direct reactions – Stripping reactions and the shell model.

Unit – IV   **(18 hours)**
        Nulcear Fission and Fusion : Nuclear fission – Nuclear fusion and thermonuclear reactions – controlled thermonuclear reactions.

Nuclear chain reaction(four factor formula) – The critical size of a reactor – General aspects of reactor design.

Unit – V **(18 hours)**

Elementary Particles : Introduction – Classification of elementary particles – Fundamental interactions – Conservation laws.

Elementary particle symmetries – Quarks – Isospin of Quarks – Quantum chromodynamics.

BOOKS FOR STUDY:
1. Nuclear Physics by D.C. Tayal. Fifth revised & enlarged edition reprint 2010 – Himalaya publishing house.
   Unit – I : 8.1 – 8.12
   Unit – II : 9.1 – 9.8
   Unit – III : 10.1 – 10.4, 10.7 – 10.17, 10.19 – 10.21, 10.24, 10.25
   Unit – IV : 13.1 – 13.3, 15.2 – 15.4
   Unit – V : 18.1 – 18.4, 18.18 – 18.20, 18.24

BOOK FOR REFERENCE:
1. Nuclear Physics an Introduction by S.B. Patel. Reprint 1992 – Wiley Eastern Limited.
2. Nuclear Physics by Devanathan. Second edition – Narosa publishing house.
3. Nuclear Physics by S.N. Ghoshal. Reprint 2012 – S. Chand.
4. Nuclear and Particle Physics an Introduction by B.R. Martin. Second edition – Wiley.
Introduction to Particle Physics by M.P. Khanna – PH

COURSE : II M.Sc. PHYSICS SEMESTER : III	FIBRE OPTIC COMMUNICATION MAJOR ELECTIVE	Hours : 6 Credit : 5

Subject Code : P1PHE31

Contact Hours per Semester: 90 hrs
Objectives
- To get fundamental idea about Optical Fibre Communication.
- To understand the structure and types of Optical Fibre.
- To learn about the types of solid state optical sources.
- To understand the different techniques of power Launching & Coupling in optical fibre.
- To get knowledge about Photo detectors.

UNIT -I Overview of Optical Fibre Communication **(18 hours)**
Advantages of optical fibres – Channel capacity – Decibel units – Telecom signal multiplexing – SONET/SDH multiplexing Hierarchy – WDM concepts – overview of element applications – windows and spectral bands – standards for optical fibre communications.

UNIT – II Optical Fibres and Signal Degradation **(18 hours)**
Single-mode fibres – propagation modes in single-mode fibres – Graded index fibre structure – Fibre materials – Glass fibres – Active glass fibres – plastic optical fibres – photonic crystal fibres – index guiding PCF – Photonic bandgap fibre – Fibre fabrication – outside vapour – phase oxidation – vapour phase axial deposition – Modified chemical vapour deposition – Plasma activated chemical vapour deposition – Photonic crystal fibre fabrication, Attenuation – Scattering losses – Core and Clading losses – Signal distortion in fibres .

UNIT – III Optical Sources   **(18 hours)**

Energy bands – intrinsic and extrinsic material – The p-n junctions – Direct and Indirect bandgaps – Semiconductor device fabrication – LED's – LED structures – Light source materials – Quantum efficiency and LED power - Modulation of an LED – Laser diodes – Laser diode modes and Threshold conditions.

UNIT –IV Power Launching & Coupling   **(18 hours)**

Source to fibre power launching – Power coupling calculation – Power launching versus wavelengths – Equilibrium Numerical aperture – Lensing schemes for coupling improvement – non-imaging microsphere – Laser diode to fibre coupling – fibre to fibre joints – Mechanical misallignment – Fibre related losses – fibre-end face preparation – LED coupling to single-mode fibres – fibre splicing – splicing techniques – splicing single-mode fibres – optical fibre connectors – connector types – single-mode fibre connectors.

UNIT – V Photodetectors   **(18 hours)**

Physical principles of photodiodes – the pin photodetection – Avalanche photodiodes – Photodetector noise – noise sources – signal to noise ratio – Detector response time – Depletion layer photocurrent – Response time – Double heterostructure photodiodes – avalanche multiplication noise structure for InGeAs APD's.

Text Books for study:

Optical Fibre Communication - Gerd Keiser - Fourth Edition Mc Graw Hill, International publishing Company Limited, New Delhi, 2008..

Unit I: Chap. (1) Seetions 1.1.2,1.3.5, 1.3.6, 1.4.1, 1.4.2, 1.5, 1.6.1, 1.6.2, 2.3.1 -2.3.5,2.4.1, 2.4.2.

Unit - II: Chap. (2) Seetions 2.5.1-2.5.2, 2.6, 2.7.1-2.7.3, 2.8.1-2.8.2, 2.9.1-2.9.5, 3.1.1-3.1.5.

Unit-Ill: Chap. (4) Seetions 4.1.1-4.1.5, 4.2.1-4.2.4, 4.3, 4.3.1.

Unit IV: Chap. (5) Seetions 5.1, 5.1.1-5.1.4, 5.2, 5.2.1-5.2.2, 5.3, 5.3.1-5.3.3, 5.4, 5.5, 5.5.1-5.5.2, 5.6, 5.6.1-5.6.2.

Unit- V: Chap. (6) Seetions 6.1, 6.1.1-6.1.2, 6.2, 6.2.1-6.2.2, 6.3, 6.3.1-6.3.3, 6.4, 6.5.

COURSE : II M.Sc. PHYSICS SEMESTER : III	**Digital Electronics and General Physics Core Lab 3**	Hours : 6 Credit : 5

Subject Code : P1PHC3P1

Contact Hours per Semester: 90 hrs

INTERNAL: 40   **EXTERNAL: 60**

   17. Active Filters – Low, high and band pass Filters.
   18. Solving Simultaneous equations (IC 741).
   19. Half adder/ Full adder/ Subtractor using IC's.
   20. Optimization of Boolean function- K-Map method.
   21. Verification of De Morgan's theorem and Boolean function.
   22. Hall effect.
   23. Refractive index of liquid using Newton's rings.
   24. Refractive index and Diffraction experiments – Using Laser.
   25. Quincke's method – Susceptibility measurements.
   26. Ring counter and Shift register.

27. Flip-Flops – RS and JK.

COURSE : II M.Sc. PHYSICS SEMESTER : IV	SOLID STATE PHYSICS II CORE PAPER 10	Hours : 6 Credit : 4

Subject Code : P1PHC41

Contact Hours per Semester: 90 hrs

Objectives

- To understand the nature of Fermi surfaces in metals.
- To study about the Plasma oscillations.
- To impart the knowledge about super conductivity.
- To understand the electromagnetic properties of solids.

Unit I: Fermi Surfaces and Metals   **(18 hours)**

Zone schemes: Reduced, Extended and Periodic zone schemes. *Fermi surface and Energy bands*: Electron orbits – Hole orbits and Open orbits – Tight binding method for the calculation of energy bands – Wegner Seitz method – Cohesive energy. *Experimental methods in Fermi surface*: Quantization of orbits in a magnetic field – De Haas -van Alphen effect – Extremal orbits – Fermi surface of Copper and Gold.

Unit II: Elementary Excitation States   **(18 hours)**

Plasmons: Dielectric function of the electron gas – Plasma optics – Longitudinal plasma oscillations - Electrostatic screening – Screened coulomb potential – Mott transition. *Polaritons and Polarons*: LST relation – Electron and electron interaction – Fermi liquid – Electron and Phonon interaction – Peierls instability of Linear metals. *Excitons*: Frenkel and Mott-Wannier excitons – Exciton condensation – Raman effect in crystals.

Unit III: Superconductivity   **(18 hours)**

Experimental survey: Occurrence – Destruction by magnetic fields – Meissner effect – Type I and Type II superconductors – Heat capacity – Energy gap – Microwave and infrared properties – Isotope effect. *Theory*: London theory of Meissner effect – Coherence length – Basic idea of BCS theory – BCS ground state – Flux quantization – DC and AC Josephson effect. *High temperature Superconducting (HTSC) materials*.

Unit IV: Dielectrics and Ferroelectrics   **(18 hours)**

Maxwell equations: Polarization – Macroscopic electric field – Depolarization field – Local electric field – Lorentz field – Dipole field. *Dielectric constant and Polarizability*: Clausius-Mossoti relation – Various types of polarizability – Ferro electricy – its occurrence and classification – Soft optical phonons. *Structural phase transition*: Landau theory of phase transitions – First and second order phase transitions – Ferroelectric domains – Piezoelectric crystals.

Unit V: Magnetism   **(18 hours)**

Dia and para magnetism: Langevin's diamagnetism equation – Quantum theory of Para magnetism – Hund rules – Quenching of orbital angular momentum – Van-Vleck temperature independent para magnetism. *Ferromagnetism*: Curie point and exchange field – Weiss molecular field theory – Ferromagnetic domains – Origin of domains – Coercivity and

Hysteresis – Bloch wall – *Magnons*: Quantization of spin waves and thermal excitation of magnons – Solitons.

Book for Study:

      1. C. Kittel, 1996, Introduction to Solid State Physics, 7th Edition, Wiley, New York.

      Unit I: Chapter 9
      Unit II: Chapter 10
      Unit III: Chapter 12
      Unit IV: Chapter 13
      Unit V: Chapters 14 &15

Books for Reference:

      1. J.P. Srivastava, 2006, Elements of Solid State Physics, PHI Learning Pvt. Ltd., New Delhi.

      2. S.O. Pillai, 1997, Solid State Physics, New Age International, New Delhi.

      3. N.W. Aschroft and N.D. Mermin, Solid State Physics, Rhinehart and Winton, New York.

      4. A.J. Dekker, Solid State Physics, Macmillan India, New Delhi.

      5. H. Ibach and H. Luth, 2003, Solid State Physics, Springer (India), New Delhi.

      6. S.O. Pillai, 1994, Problems and Solutions in Solid State Physics, New Age International, New Delhi.

COURSE : II M.Sc. PHYSICS SEMESTER : IV	MOLECULAR SPECTROSCOPY CORE PAPER 11	Hours : 6 Credit : 4

Subject Code : P1PHC42

Contact Hours per Semester: 90 hrs

Objectives

- To get knowledge about rotational spectrum of molecules.
- To understand the nature of vibration of molecules.
- To impart the knowledge about Raman spectra of molecules.
- To get knowledge about electronic spectra and spin resonance spectra of molecules.

Unit I: Introduction and Microwave spectroscopy   **(18 hours)**

Quantization of energy – Regions of spectrum – The width and intensity of spectral transition – Fourier transform spectroscopy. The rotation of molecules – Rotational spectra – Diatomic molecules – Polyatomic molecules

Unit II: Infrared spectroscopy   **(18 hours)**

The vibrating diatomic molecules – The diatomic vibrating rotator – The vibrational and rotational spectrum of carbon monoxide – Born-Oppenheimer approximation – The vibrations of polyatomic molecules – The rotation on the spectra of polyatomic molecule.

Unit III: Raman spectroscopy   **(18 hours)**

Pure rotational Raman spectra – Vibrational Raman spectra – Raman spectroscopy of diatomic and polyatomic molecules - Polarization of light and the Raman effect – Structure determination from IR and Raman spectra – Near IR and FT- Raman spectroscopy.

Unit IV: Electronic spectroscopy of molecules   **(18 hours)**

Electronic spectra of diatomic molecules – Electronic structure of diatomic molecules – Analysis of diatomic vibronic spectra – Dissociation – Electronic structure of polyatomic molecules – Molecular photoelectron spectroscopy.

Unit V: Spin resonance spectroscopy   **(18 hours)**

NMR in crystalline solids – High resolution NMR spectra – Basic concepts – General treatment and analysis with examples – Total magnetic Hamilton of an electron – Magnetic interactional in atoms – Free radial ESR spectrum.

Book for Study:

Molecular Spectroscopy –4th Edition - C. N. Banwell and E. M. McCash – Tata McGraw-Hill.
Unit – I   : Chapter 1 & 2
Unit – II : Chapter 3
Unit – III : Chapter 4
Unit – IV : Chapter 6
Unit – V : Chapter 7

Books for Reference:

1. Spectroscopy – Vol. 2 – B. P. Staughan and S. Walker – Chapman and Hall.
2. Molecular Spectroscopy – Jack D. Graybeal – McGraw-Hill.
3. Molecular Spectra and Molecular Structure – Vol. I 2nd Edition – G. Herzberg, Van Nostrand Reinhold.

COURSE : II M.Sc. PHYSICS SEMESTER : IV	QUANTUM MECHANICS II CORE PAPER 12	Hours : 6 Credit : 4

Subject Code : P1PHC43

Contact Hours per Semester: 90 hrs

Objectives

- To understand the scattering mechanism in microscopic interactions such as nuclear reactions.
- To understand the fundamentals of Quantum Mechanics using Dirac vector notations and Hilbert space.
- To learn about the operators of total angular momentum, addition of angular momenta and the procedure to evaluate CG coefficients.
- To impart the knowledge about time dependent perturbation theory and its applications to Physics problems.
- To understand the Relativistic Quantum Mechanics using KG equation and Dirac equation.

UNIT-I   **(18 hours)**

Scattering Cross Section: General Considerations: Kinematics of the Scattering Process: Differential and Total Cross Sections - Wave mechanical picture of scattering: The scattering amplitude - Green's Functions; Formal expression for scattering amplitude. The Born and Eikonal approximations: The Born approximation - Validity of the Born approximation - The Born series - The Eikonal approximation partial wave analysis: Asymptotic behavior of partial waves: Phase Shifts - The scattering amplitude in terms of phase shifts - The differential and Total cross sections - Phase Shifts: Relation to the potential - Low energy scattering, Exactly soluble problems: Scattering by a square well potential - Scattering by a Hard Sphere - Scattering by a coulomb potential.

UNIT – II   **(18 hours)**

Representations, Transformations and Symmetries: Quantum States: State Vectors and Wave Functions - The Hilbert Space of State vectors; Dirac notation - Dynamical variables and linear operators - Representations - Continuous basis - The Schrodinger representation - Degeneracy; Labeling by commuting observables - Change of basis; Unitary transformations - Unitary transformations induced by change of coordinate systems: Translations - Unitary transformation induced by rotation of coordinate system -The algebra of rotation generators ~ Transformation of dynamical variables - symmetries and conservations laws - space inversion - Time reversal.

UNIT – III   **(18 hours)**

Angular Momentum: The eigen value spectrum - Matrix representation of J in the |jm> Basis - Spin Angular Momentum - Non relativistic Hamiltonian Including spin -Addition of Angular Momenta - Clebsch-Gordan Coefficients - Spin Wave Functions for a system of Two Spin-1/2 particles - identical particles with spin.

UNIT – IV   **(18 hours)**

Evolution with Time: Perturbation theory for time Evolution Problems: Perturbative solution for transition amplitude - Selection Rules - First Order Transitions: Constant perturbation - Transitions in the second order: Constant perturbation - Scattering of particle by a potential - Harmonic Perturbations - Interaction of an Atom, with Electromagnetic Radiation - The Dipole Approximation: Selection Rules - The Einstein Coefficients: Spontaneous Emission. The Schrödinger Picture, the Heisenberg Picture, the Interaction Picture.

UNIT – V   **(18 hours)**

Relativistic Wave Equations: The Klein - Gordon Equation: Plane wave solutions: Charge and Current Densities - interaction with Electromagnetic Fields; Hydrogen like Atom - Non relativistic limit. The Dirac equation : Dirac Relativistic Hamilton-Position Probability Density; Expectation values - Dirac matrices - Plane wave solutions of the Dirac Equation; Energy spectrum - The Spin of the Dirac particle - Significance of "Negative Energy States; Dirac Particle in Electromagnetic Fields - Relativistic Electron in a Central Potential: Total Angular Momentum.

Text Book for study:

   1. *A Text book of Quantum Mechanics - P.M.Mathews & K.Venkatesan - TMH Pub.Com.Ltd., New Delhi (2010)- II edition.*
Unit I: Chap. (6) Sees. 6.1 - 6.11 & 6.13 - 6.16.
Unit - II: Chap. (7) Sees. 7.1 - 7.14
Unit-Ill: Chap. (8) Sees. 8.1 - 8.8
Unit IV: Chap. (9) 9.7 - 9.11, 9.14 - 9.17, 9.18, 9.19, & 9.23.
Unit- V: Chap. (10) Sees. 10.1 - 10.12.

Books for reference:

1. *Quantum Mechanics - L.I. Schiff- III Edition*
2. *Quantum Mechanics - E. Merzbacher*
3. *Quantum Mechanics - Ghatak and Loganathan*
4. *Quantum Mechanics - A.S. Davydov*

COURSE : II M.Sc. PHYSICS	NANOPHYSICS	Hours : 6
SEMESTER : IV	MAJOR ELECTIVE	Credit : 5

Subject Code : P1PHE41

Contact Hours per Semester: 90 hrs

Objectives:

- To know about instruments to study nano materials
- To learn about methods to fabricate nano structures
- To understand the properties of nano materials
- To have a knowledge of quantum structures

Unit I **(18 hours)**

Electron microscope – Electron microscopy – General consideration for imaging – Analytical and imaging techniques – Sample preparation – Disadvantages of electron microscopes – Transmission electron microscope – Background – High resolution Transmission electron microscopy – Preparation and visualization of samples – Imaging simulation – Particle size analysis – Scanning electron microscope – detection of secondary electrons - detection of Backscattered electrons - Secondary electron imaging – Microscope imaging – Scanning probe microscopy – Imaging structures – The SPM as a robot – Sensing

Unit II **(18 hours)**

Atomic force microscopy – Introduction – Theory – Piezoelectric ceramic transducer – AFM instrumentation – Imaging modes – Measuring images with AFM – Resolutions in Atomic force microscope - Probe surface interactions - Surface contamination – Electrostatic forces – Surface material properties – Vibrating sensing mode – Torsion modes – Mechanical surface modification – Electrical surface modification - Atomic force microscopy for nanoparticles – Qualitative analysis – Techniques – Direct growth by Chemical vapour deposition of AFM tips – CVD MWNT tip preparation - CVD SWNT tip preparation – Sample preparation – Nanolithography – Adhesive mask technique – Photolithography – resolution in projection systems – Limitations – Perspectives – Electron beam lithography – Electron energy deposition in matter – Spatial-phase-locked Electron beam lithography

Unit III **(18 hours)**

Fabrication of nanostructures – Milling – Lithographic processes – Lift-off process – Vapour phase deposition methods of fabrication – Plasma-assisted deposition methods of fabrication – DC glow discharge – Magnetron sputtering – Vacuum arc deposition – Nanofabrication by scanning probe techniques – By Scanning force probes – Electrical structure generation by SFM – By Scanning tunneling microscope – Growth and characterization techniques – Molecular beam epitaxy – MBE apparatus – MOVPE – Liquid phase methods – Colloidal methods – Fabrication by sol-gel methods – basic process – The experimental – Conclusions – Electro deposition

Unit IV **(18 hours)**

Properties of individual nanoparticles – Metal nanoclusters – Magic numbers - Theoretical modeling of nanoparticles – Geometric structure – Electronic structure – Reactivity – Fluctuations – Magnetic clusters – Bulk to Nanotransition – Carbon nanostructures – Carbon molecules – Carbon clusters – Carbon nanotubes – Applications of carbon nanotubes

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Unit V   **(18 hours)**

Quantum wells, Wires and Dots – Preparation of quantum nanostructures – Size and dimensionality effects – Excitons – Single electron tunneling – Applications – Superconductivity – Microelctromechanical systems – Nanoelectromechanical systems

Books for Study:

1. Instrumentations and Nanostructures by A.S. Bhatia, NuTech books, 2009
   Unit I – Page 1 – 26, Page 52 – 64
   Unit II – Page 65 – 86, Page 124 – 151
   Unit III – Page 219 – 249
2. Introduction to Nanotechnology by Charles P. Poole Jr and Frank J. Owens, Wiley Student edition, Reprint 2008
   Unit IV – Page 72 – 89, Page 103 – 132
   Unit V – Page 226 – 256, Page 332 - 345

COURSE : II M.Sc. PHYSICS	**PROJECT**	Hours : 6
SEMESTER : IV	**CORE LAB 4**	Credit : 5

Subject Code: P1PH4PV

- Project will be done by the final year students in the fourth semester under the guidance of respective guides.
- For projects internal marks (max 40) will be awarded by the respective guide and external marks (max 60) will be awarded in the external examinations(internal examiner 30 marks & external examiner 30 marks) held at the end of the semester
- Minimum number of Pages for M.Sc. Project thesis should be 40

Course Name: Bachelor of Science

Discipline   : Chemistry

Course scheme

Sem	Part	Subject	Hrs	Cr	Int+Ext=Total	Code	Revision
III	I	Tamil / Hindi	6	3	25+75 = 100	U1PT31/ U1PH31	Revised
	II	English III	6	3	25+75 = 100	U1PE31	Revised
	III	Core Subject III – Inorganic and Physical Chemistry	4	4	25+75 = 100	U1CHC31	Revised
	III	Core Lab II – Semi-micro Inorganic Qualitative Analysis	2	-	---	---	-
	III	Allied I (Maths / Oils & Fats)	6 / 4	4/3	25+75 = 100	U1MAA3X3/ U1CHA31	Revised/ Revised
	III	Allied Lab II – Food analysis	2	-	---	---	-
	III	Allied II (Physics)	4	4	25+75 = 100	U1PHA3X1	No Change
	III	Allied II Lab(Physics)	2	-	---	---	-
IV	I	Tamil / Hindi	6	3	25+75 = 100	U1PT41/ U1PH41	**Revision**
	II	English IV	6	3	25+75 = 100	U1PE41	Revised
	III	Core Subject IV – Organic and Physical Chemistry	4	4	25+75 = 100	U1CHC41	Revised
	III	Core Lab II – Semi-micro Inorganic Qualitative Analysis	2	2	40+60 = 100	U1CHC4P1	Revised
	III	Allied I (Maths / Oils & Fats)	6 / 4	4/3	25+75 = 100	U1MAA4X4/ U1CHA41	-
	III	Allied Lab II – Food analysis	2	2	40 + 60 = 100	U1CHA4P1	Revised/ Revised
	III	Allied II (Physics)	4	4	25+75 = 100	U1PHA4X2	-
	III	Allied II Lab(Physics)	2	2	40 + 60 = 100	U1PHA4PX	No

							Change

Semester III – Part III – Core Subject – Inorganic and Physical Chemistry
Hours per week: 4   Credits: 4
Subject Code: U1CHC31

Objectives:
- To acquire knowledge about the metallurgy of some metals and also to study the preparation, properties and uses of some important inorganic compounds.
- To study the importance of nuclear reactions.
- To understand the fundamentals of co-ordination chemistry and liquid state.
- To apply rules of distribution to solvent extraction and purification of solvents.

Unit I: General principles of metallurgy   (12 hours)
Physicochemical methods involved in metallurgy – concentration, calcination, reduction, roasting, zone refining, solvent extraction, hydrometallurgy and electrochemical methods with reference to gold, nickel, calcium, copper and manganese.

Preparation, properties and uses of some important compounds – titanium dioxide, ammonium molybdate, vanadium pentoxide and chloroplatinic acid.

Unit II: Nuclear chemistry   (12 hours)
Mass defect and binding energy, packing fraction, stability of nucleus - Soddy's group displacement law – law of radioactivity – neutron-proton ratio. Artificial radioactivity, nuclear fission – nuclear fusion – emission of energy – Stellar energy and hydrogen bomb. Nuclear reactors. Separation of isotopes. Detection and measurement of radioactivity – GM counter. Applications of radioisotopes in agriculture, medicine and industry – Radio carbon dating.

Unit III: Coordination chemistry   (12 hours)
Introduction, nomenclature – geometrical and optical isomerism in complexes. Werner's theory, Sidgwick theory, EAN rule. VB theory – low spin and high spin complexes – magnetic properties – limitations of VB theory. Crystal Field theory (CFT) – octahedral and square planar complexes – colour of coordination complexes.

Unit IV: Liquid state   (12 hours)
Nature of cohesive forces in liquids – Trouton's rule and its significance. Physical properties and chemical constitution: Molar volume and its application.

Surface tension – influence of temperature on surface tension – Parachor – atomic and structural parachors – applications. Viscosity – viscosity measurement – Ostwald's viscometer – influence of temperature on viscosity- relation to chemical constitution – molecular viscosity – atomic and structural viscosity – Rheochor.

Molar refraction – liquid crystal – vapour pressure-temperature diagrams – types of liquid crystals – arrangement and applications of liquid crystals.

Unit V: Distribution law   (12 hours)

Nernst distribution law- explanation of distribution law- limitations of distribution law – applications of distribution law – Henry's law – determination of equilibrium constant from distribution coefficient – solvent extraction. Desilverization of lead – determination of association, dissociation and solubility – distribution indicators.

Reference Books
Units I – III
1. Satyaprakash's Modern Inorganic Chemistry, R.D.Madan, S.Chand & Co., New Delhi, 2005.
2. Principles of Inorganic Chemistry, B.R.Puri, L.R.Sharma and K.C.Kalia, Milestone Publishers, New Delhi, 2011.
3. Concise Inorganic Chemistry, Fifth edition, J.D.Lee, Blackwell Science Ltd., Oxford University Press, 2000.
4. R. Gopalan Textbook of Inorganic Chemistry, Universities Press Pvt. Ltd., 2012.
Units IV and V
1. Principles of Physical Chemistry, B.R.Puri, L.R.Sharma and S.Pathania, Vishal Publishing Co., New Delhi, 2005.
2. Textbook of Physical Chemistry, P.L.Soni, Sultan Chand & Sons, New Delhi, 2008.
3. Essentials of Physical Chemistry, Arun Bahl, B.S.Bahl and G.D.Tuli, S.Chand & Co., New Delhi, 2004.
M.V. Sangaranarayanan and V. Mahadevan Textbook of Physical Chemistry, Universities Press Pvt. Ltd., 2011

Semester IV – Part III – Core Subject – Organic and Physical Chemistry
Hours per week: 4   Credits: 4
Subject Code: U1CHC41

Objectives:

- To have an expertise knowledge in the preparation of substituted benzene and heterocycles.
- To enable students to gain structural knowledge of different carbohydrates and crystal structures.
- To prepare the students the concepts of basic mathematics for understanding and deriving the physical chemistry equations on spectroscopy concepts.

Unit I: Structure of benzene, aromaticity and orientation   (12 hours)
Structure of benzene, resonance energy of benzene. Aromaticity – Huckel rule. Mechanism of aromatic electrophilic substitution reactions – halogenation, nitration and sulphonation of benzene – Friedel-Crafts alkylation and acylation. Directive influence of substituents – ortho-para and meta directing groups – effect of substituents on reactivity – theory of directing effects – theory of activating and deactivating effects.

Unit II: Heterocyclic compounds   (12 hours)
Classification of heterocyclic compounds – Preparation, properties, uses and structure of 5-membered heterocycles – pyrrole, furan, thiophene. 6-Membered heterocycles – pyridine – preparation, properties and structure of pyridine. Condensed ring heterocycles – preparation, properties and uses of quinoline and isoquinoline.

Unit III: Carbohydrates   (12 hours)

Definition – classification – monosaccharides – properties and uses of glucose and fructose – configuration of glucose – Haworth structure – conversion of glucose to fructose and vice versa. **Disaccharides:** Sucrose – Distinction between sucrose, glucose and fructose. **Polysaccharides:** Starch and cellulose (structure only) α-amylose.

Unit IV: Solid state   (12 hours)

Isotropy and anisotropy – symmetry in crystal systems – space lattice – unit cell – Bravais lattice – seven crystal systems – laws of crystallography – law of constancy of interfacial angle, law of symmetry, law of rational indices – Miller indices – symmetry elements in a crystal.

X-Ray diffraction – Bragg's equation – experimental method of determination of interplanar spacing.

Types of crystals: Ionic ($NaCl$ and $CsCl$), molecular (water), covalent (diamond and graphite) and metallic crystals.

Conductors, insulators and semiconductors – Frankel and Schottky defects (elementary ideas only).

Unit V: Mathematical concepts   (12 hours)

Curve sketching, linear graphs, slopes, dependent and independent variables – polynomial, exponential and trigonometric functions, derivative of a function – differentiation formulas – maxima and minima – partial differentiation – the Euler reciprocal relation – integration (only definition) and its formulas – matrices – multiplication – determinants – complex numbers.

Reference Books

Units I – III

1. P.L.Soni and H.M.Chawla, Textbook of Organic Chemistry, Sultan Chand & Sons, New Delhi, 2007.
2.B.S.Bahl and Arun Bahl, Advanced Organic Chemistry, S.Chand & Co. Ltd., New Delhi, 2003.

Units IV and V

1. Principles of Physical Chemistry, B.R.Puri, L.R.Sharma and S.Pathania, Vishal Publishing Co., New Delhi, 2005.
2. Textbook of Physical Chemistry, P.L.Soni, Sultan Chand & Sons, New Delhi, 2008.
3. Essentials of Physical Chemistry, Arun Bahl, B.S.Bahl and G.D.Tuli, S.Chand & Co., New Delhi, 2004.
4. V. Sangaranarayanan and V. Mahadevan Textbook of Physical Chemistry, Universities Press Pvt. Ltd., 2011

Part III – Core Lab II – Semi-micro Inorganic Qualitative Analysis
Hours per week: 2 Credits: 2

Subject Code: U1CHC4P1

Objectives:

- To practice the identification of various anions and cations present in minerals in the presence of eliminating anions.

Semi-micro inorganic qualitative analysis

Analysis of a mixture containing two anions, of which one is an interfering anion and two cations.

Anions: Carbonate, sulphate, nitrate, fluoride, chloride, bromide, iodide, oxalate, borate, phosphate and chromate.

Cations: Lead, bismuth, copper, cadmium, iron (II and III), aluminium, chromium, zinc, manganese, cobalt, nickel, barium, strontium, magnesium and ammonium.

Course Name : Master of Science

Discipline : Chemistry

Course scheme:

Sem	Part	Subject	Hr	Cr	Int+Ext = Total	Code	Revision
III	III	Core Subject VII – Organic chemistry III	5	4	25+75= 100	P1CHC31	Revised
	III	Core Subject VIII – Inorganic chemistry III	5	4	25+75= 100	P1CHC32	Revised
	III	Core Subject IX – Physical chemistry III	5	4	25+75= 100	P1CHC33	Revised
	III	Core lab IV – Organic chemistry practical II	4	-	---	---	-
	III	Core lab V – Inorganic chemistry practical II	4	-	---	---	-
	III	Core lab VI – Physical chemistry practical II	3	-	---	---	-
	III	Major Elective 2 – Medicinal and Pharmaceutical Chemistry / Polymer Chemistry	4	4	25+75= 100	P1CHE31/ P1CHE32	Interchanged and Revised
IV	III	Core Subject X – Organic chemistry IV	5	4	25+75= 100	P1CHC41	Revised
	III	Core Subject XI – Inorganic chemistry IV	5	4	25+75= 100	P1CHC42	Revised
	III	Core Subject XII – Physical chemistry IV	5	4	25+75= 100	P1CHC43	Revised
	III	Core lab IV – Organic chemistry practical II	4	4	40+60 =100	P1CHC4P1	Interchanged & Revised
	III	Core lab V – Inorganic chemistry practical II	4	4	40+60 =100	P1CHC4P2	Interchanged & Revised
	III	Core lab VI – Physical chemistry practical II	3	3	40+60 =100	P1CHC4P3	Interchanged & Revised
	III	Major Elective 3 – Computer Applications / Introduction to Nanoscience	4	4	25+75= 100	P1CHE41/P1CHE42	No Change/ Revised
	III	Project: (Report + viva)		4	100 (Internal)	P1CH4PV	No change

Semester - III - Part – III - Core Subject VII - Organic Chemistry III

Hours per week: 5   Credits: 4

Subject Code: P1CHC31

Objectives:

- To plan and execute organic synthesis
- To get mastery over photochemical, oxidation, reduction and rearrangement reactions.
- To revise the structure of carbohydrate, proteins and nucleic acids.

Unit I: Synthetic methods I (15 hours)

Planning a synthesis – molecular history – Relay approach – starting materials – molecular size – convergent approach – carbon skeletal complexity (Robinson annulations, Michael addition, Diels-Alder reaction) – Functionality, steric crowding – geometrical isomerism – problems of optical isomerism control of asymmetry during construction of poly asymmetric molecules – protecting (blocking) groups – activating groups – Umplong synthesis – transition metal complexes in organic chemistry – Homogeneous hydrogenation.

Unit II: Organic photochemistry and pericyclic reactions (15 hours)

Organic photochemistry : Basic principle – $n \rightarrow \pi^*$ and $\pi \rightarrow \pi^*$ transitions – allowed and forbidden transitions – internal conversion – intersystem crossing – Jablonski diagram (Fluorescence and Phosphorescence). Photochemistry of olefins – *cis–trans* isomerisation – Paterno – Buchi reaction – Norrish type I and type II reactions – photo reduction of ketones – Di - π methane rearrangement – photo oxidation – photosensitization.

Pericyclic reactions : Conservation of orbital symmetry – Electrocyclic reactions – Cyclo addition reactions and Sigmatropic rearrangements – application of correlation approach, Frontier Molecular Orbital approach, Huckel – Mobius approach and perturbation molecular orbital approach to the above reactions.

Unit III: Molecular rearrangement (15 hours)

Mechanism of the following rearrangement reactions–Demzanov, Beckmann, Hofmann, Wolff, Baeyer–Villiger, Stevens, Sommelet–Hauser, Favorskii, Benzil–benzilic acid, Claisen, Cope, Fries, Dienone – phenol rearrangement.

Free radical rearrangement reactions – Barton, Sand Meyer, Gomberg–Bachmann, Ullmann, Pschorr and Hundsdiecker reaction.

Unit IV: Carbohydrate, proteins and nucleic acid (15 hours)

Carbohydrate: Ring structure of the monosaccharides – methods for determining the size of sugar rings – chemistry, configuration and conformation of lactose and cellobiose – chemistry of starch and cellulose.

Proteins and Nucleic acids: Classifications of proteins – peptides – structural elucidation synthesis of peptides – structural elucidation of Glutathione and Oxytocin – An elementary treatment of enzymes, coenzymes and nucleic acids – Genetic code – DNA and determining the base sequence of DNA.

Unit V: Oxidation and reduction (15 hours)

Elimination of hydrogen and aromatization reactions – catalytic dehydrogenation – mechanism, applications and stereochemical aspects of the following oxidation – reduction reactions; Oxidation reactions involving CrO_3, SeO_2, Lead tetracetate, periodic acid, N – bromosuccinimide, H_2O_2 – Oppenauer oxidation.

Catalytic hydrogenation – Reactions involving $LiAlH_4$, triisobutoxyalumino hydride, DIBAL and $NaBH_4$ – Birch reduction – Meerwein–Pondorf–Verley reduction – Wolff–Kishner reduction - Hydroboration – selectivity in oxidation and reduction – Huang–Minlon reduction.

Reagents in organic synthesis: Gilman's reagent, lithium dimethyl cuprate (LDC) , lithium diisopropyl amide (LDA), dicyclohexylcarbodiimide (DCC), *1,3*–dithiane, trimethylsilyl iodide, DDQ.

Reference books :

1. R.E. Ireland , Organic Synthesis , Prentice – Hall of India Pvt. Ltd., 1975.
2. R.T. Morrison and R.N. Boyd, Organic Chemistry , Prentice – Hall of India, New Delhi, 6th Edn., 2001.
3. M.B. Smith, Organic Synthesis , McGraw – Hill , International edn., New Delhi, 1994.
4. W.Carruthers and Iain Coldhain, Modern Methods in Organic Synthesis, 4th Edn., Cambridge University Press , U.K., 2008.
5. F.A.Carey and R.J.Sundberg, Advanced Organic Chemistry: Part B, V Edn., Springer, New York, 2007.
6. C.H. Depuy and O.L. Chapman, Molecular Reactions and Photochemistry, Prentice Hall, 1972.
7. S.M. Mukherji and S.P. Singh, Reaction Mechanism in Organic Chemistry, McMilan India Ltd., 1978.
8. R.B. Woodward and R. Hoffmann, The Conversion of Orbital Symmetry, Verlog Chemie Gmbh and Academic Press , 1971.
9. H.H. Jaffe and M. Orchin, The Importance Antibonding Orbitals, Oxford and IBH, 1967.
10. A.J. Bellamy, An Introduction to Conservation of Orbital Symmetry, Longman, 1974.
11. J. March, Advanced Organic Chemistry, John Wiley & sons, 4th Edn., New York , 1992.
12. I.L. Finar, Organic Chemistry , Vol. II , 5th Edn., Pearson Education Ltd., New Delhi, 2011.
13. S.F. Dyke, The Carbohydrates, Interscience Publishers Ltd., London, 1960.
14. I.L. Finar, Organic Chemistry , Vol. II , 5th Edn., Pearson Education Ltd., New Delhi, 2011.
15. J.L. Jain, Fundamental of Biochemistry, 4th Edn., S.Chand & Company Ltd., New Delhi, 1998.
16. A.L. Lehninger , Principle of Biochemistry, W.H.Freeman and Company, New York, 2005.
17. R.O.C. Norman, Organic Synthesis, 3rd Edn., 1993.
18. W.Carruthers and Iain Coldhain, Modern Methods in Organic Synthesis, 4th edn., Cambridge University Press , U.K., 2008.
19. S.H.Pie, J.B.Herndrickson, D.J.Cram and G.S.Hammond, Organic Chemistry, McGraw Hill Kogakusha Ltd., Tokyo , 4th Edn., 1980.
20. H.O. House, Modern Synthetic Reactions, W.A. Benjamin Inc. California, 2nd Edn., 1972.

Semester III – Part III – Core Subject VIII – Inorganic Chemistry III
Hours per week: 5   Credits: 4
Subject Code: P1CHC32

Objectives:
- To understand the various bio-inorganic compounds.
- To get an insight into the crystal structure of various types of inorganic crystals.
- To be competent with electronic spectra, NMR, EPR spectra of inorganic compounds.

Unit I – Bioinorganic Chemistry I   **(15 hours)**

Porphyrin ring system – metalloporphyrins – cytochrome-C – dioxygen binding transport and utilization - hemoglobin and myoglobin – structure and work function – physiology of blood -

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Chlorophyll – structure – photosynthetic sequence – Corrin ring system – Vitamin B_{12} and Vitamin B_{12} coenzymes – Nitrogen fixation *in-vivo* and *in-vitro*.

Essential and trace elements in biological system – Molecular mechanism of ion transport across membrane – natural and synthetic ionophores – sodium and potassium pump.

Unit II– Bioinorganic Chemistry II   **(15 hours)**

Metalloenzymes – Enzymes in dioxygen management – superoxide dismutase, peroxidases and catalases – oxygeneases and monooxygeneases. Zinc enzymes – structure and function - Carboxypeptidase A – Carbonic anhydrase and Alcohol dehydrogenase – structural role of zinc and zinc constellations.

Non-heme iron proteins – iron-sulphur proteins – Copper containing proteins – classification – blue copper protein – structure and function.

Chelate therapy – detoxification of metal poisoning in functional groups of enzyme – anticancer activity of cis-platin – interactions of cis-platin with DNA. Gold compounds as anti-arthritic agents.

Unit III –Electronic spectra and Photochemistry   **(15 hours)**

Electronic spectra of transition metal complexes and photochemistry – d-d transition – Charge transfer transition – selection rules – mechanism of breakdown of selection rules – bandwidths and shapes – Jahn-Teller effect – Tanabe-Sugano diagram – evaluation of 10Dq and β for octahedral and tetrahedral complexes of d^3, d^6, d^7 and d^8 configurations

 Photoredox and photosubstitution reactions occurring in Co(III) and Cr(III) complexes – photochemistry of ruthenium polypyridyls.

Unit IV– NMR and EPR spectroscopy of Inorganic compounds   **(15 hours)**

NMR : Introduction – application of ^{31}P, ^{19}F and ^{15}N-NMR spectroscopy used in structural problem – evaluation of rate constants – NMR of fluxional molecules – NMR of paramagnetic molecules – contact shifts and shift reagents.

Principle of EPR – presentation of the spectrum – hyperfine splitting – evaluation of g and A tensors – factors affecting the magnitude of g values – zero field splitting – Kramer's degeneracy – anisotropy and hyperfine splitting constant – Application of EPR in transition metal complexes – Jahn-Teller distortion studies in Cu(II) complexes – evaluation of spin – orbital coupling constant.

Unit V – Solid state Chemistry   **(15 hours)**

Crystal defects – point, line and plane defects – colour centres – Formation of non-stoichiometric oxides – Electronic structure of solids – Free electron and band theory – Band structure of metals, different types of semiconductors, insulators – superconductivity – types of superconductors. Cooper pair – Meissner effect - Hall effect – High temperature superconductors – photovoltaic effect– Semiconductors in solar energy conversion.

Unit cell structure of zinc blende, wurtzite, fluorite, antifluorite, rutile and cesium chloride – structure of graphite and diamond – spinels normal and inverse types and pervoskite structure.

Reference books

1. K.Hussain Reddy Bioinorganic chemistry New Age Publishers New Delhi, (2009).
2. K.F.Purcell and J.C.Kotz , Inorganic Chemistry, W.B. Saunders Company,(1977
3. L.Stryer, Biochemistry, IV Edn., Freemann and Company, New York (1995).
4. D.L Nelson & M.M.Cox, Lehninger Principles of Biochemistry , 5th edition Freemann and Company, New York (2011).

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5. J.E. Huheey, E.A. Keiter and R.L. Keiter, Inorganic Chemistry Principles of Structure   and Reactivity (4th edition): Pearson Education Inc.,2006.

6. F.A.Cotton and G.Wilkinson, Advanced Inorganic Chemistry (6th edition), John Wiley&Sons, New York, 2006.

7. J.D. Lee, Concise Inorganic Chemistry , 5th edition, Blackwell Science, 2000.

8. D.F.Shriver, P.W.Atkins and C.H.Langford, Inorganic Chemistry, 3rd edition, Oxford Univ. Press, 1999.

9. R.S. Drago, Physical methods in Inorganic Chemistry , Van Nostrand Reinhold Co., New York (1965).

10. E.B.A. Edsworth, D.W.H. Ranklin and S. Gadock Structural methods in inorganic chemistry, ELBS Edn., (1988).

11. R. L. Dutta and A. Syammal, Elements of magnetochemistry, 2nd edition, EWP Pvt. Ltd., New Delhi (1993).

12. Azaroff, Introduction to Solids, Tata-McGraw Hill (1977).

13. M.G. Arora Solid state chemistry Anmol Publishers New Delhi, (2001).

14. D. K. Chakrabarty Solid state chemistry New Age Publishers New Delhi, (2010).

15. A.W. Adamson and F.D. Fleischer, Concepts of Inorganic Photochemistry, John Wiley – Inter Science.

Semester - III - Part – III - Core Subject IX - Physical Chemistry III
Hours per week: 5   Credits: 4
Subject Code: P1CHC33

Objectives:

- To study electrochemistry in depth.
- To be in competent with microwave, infra-red and electronic spectra.
- To perceive statistical thermodynamics.

Unit I: Electrochemistry I (15 hours)

Conductivities of ions- conductance of strong and weak electrolytes- Determination of equivalent conductance of weak electrolyte at infinite dilution- Kohlrausch's law and its applications- Theory of electrolytic conductance- inter-ionic attraction- ionic atmosphere- thickness of ionic atmosphere- The Debye-Huckel-Onsager conductance equation- its derivation and experimental verification- deviations and modifications- Debye Falkenhagen and Wein effects – mean ionic activity and activity coefficients of strong electrolytes- Debye-Huckel limiting law- Applications of conductance measurements- Determination of solubility of a sparingly soluble electrolytes- Determination of dissociation constant of a weak acid- conductometric titrations.

Unit II: Electrochemistry II (15 hours)

The role of electrodes- the electrochemical potential- Types of electrodes- the gas/inert metal electrode- ion/insoluble salt/ metal electrode- oxidation-reduction electrode- liquid junction potential and membrane potential – Electro chemical cells- kinds of cells- notation- electrochemical cell reactions – EMF of cells- Nernst equation- Application of EMF measurements- determination of equilibrium constant, dissociation constant, solubility product and potentiometric titrations.

Types of overpotential- Effect of overpotential on the rate of an electro-chemical reaction- Butler-Volmer equation- Tafel equation- Current potential curves- hydrogen over voltage- Application of electrochemical processes- power generation and storage- Fuel cells- storage batteries and dry cells.

Unit III: Statistical Thermodynamics (15 hours)

Aims of statistical thermodynamics- definition of state of a system- ensembles (micro, macro and grand canonical)- Boltzmann distribution law and its derivation- Boltzmann-Planck equation- partition functions- thermodynamic properties from partition functions- partition function and equilibrium constant- Quantum statistics- Fermi-Dirac and Bose-Einstein statistics- photon gas and electron gas according to such statistics- population inversion- Einstein's and Debye's theories of heat capacities of solids. Nuclear spin statistics- statistical basis of entropy of H_2 gas - ortho and para nuclear states- calculation of residual entropy of H_2 at 0 K in terms of ortho - para ratio.

Unit IV – Molecular Spectroscopy I (15 hours)

Born-Oppenheimer approximation- energy of radiations corresponding to various kinds of spectroscopy

Microwave spectroscopy- rotational classes of molecules - rotational spectra of rigid diatomic molecules- effect of isotopic substitution- relative intensity of rotational spectral lines- Stark effect in microwave spectra - Information derived from rotational spectra.

Infrared spectroscopy- energy of a diatomic molecule based on harmonic and anharmonic oscillator model- selection rules- diatomic vibrating rotator - vibrations of polyatomic molecules- fundamental vibrations and their symmetry with illustration (H_2O and CO_2) - overtone, combination and difference frequencies - influence of rotation on the spectra of polyatomic molecules - concept of group frequencies - Fermi resonance- Fourier transform infrared spectroscopy.

Unit V: Molecular spectroscopy II **(15 hours)**

Raman spectroscopy- Quantum and classical theories of Raman scattering- Rotational Raman spectrum of diatomic molecules- rotation-vibration Raman spectrum- Mutual exclusion principle- Laser Raman spectroscopy.

Electronic spectra of diatomic and polyatomic molecules- intensity of vibrational electronic spectra - Franck-Condon principle- rotation fine structure of electronic vibrational spectra- the Fortrat parabola- Dissociation and predissociation spectra.

Recommended Books

1. D.R. Crow, "Principles and Application of Electrochemistry", Chapmann Hall, London (1988).
2. J.O.M. Bockris and A.K.N. Reddy, "Modern Electrochemistry" Vol. I & II, Plenum Press, New York (1970).
3. L.Antropov, "Theoretical Electrochemistry" Mir Publications, Moscow (1972)
4. S.Glasstone, An Introduction to Electrochemistry.
5. B.Viswanathan, S. Sundaram, R. Venkataraman, K. Rengarajan and P.S. Raghavan, "Electrochemistry-Principles and Applications" S. Viswanathan Printers and Publishers Pvt., Ltd., (2007)
6. B.R. Puri, L.R. Sharma and M.S. Pathania, Principles of Physical Chemistry (Millennium Edn,) Vishal Publishing Co., (2003)
7. J. Rajaram and J.C. Kuriakose, Kinetics and mechanisms of chemical transformations Applications of Femtochemistry, Macmillan India Ltd., (2008).
8. H.K. Moudgil, Textbook of Physical Chemistry, PHI Learning Pvt., Ltd., New Delhi (2010).
9. D.A. McQuarrie and J. D. Simon, Molecular Thermodynamics, Viva Books Pvt., Ltd., New Delhi (2004).
10. F.W. Sears and G.L. Salinger, Thermodynamics, Kinetic Theory and Statistical Thermodynamics" 3rd Edn., Narosa Publshing House, New Delhi (1991).
11. B.R. Puri, L.R. Sharma and M.S. Pathania, Principles of Physical Chemistry (Millennium Edn,) Vishal Publishing Co., (2003)
12. J. Kestin and J.R. Dorfman, A course in Statistical Thermodynamics, Academic Press, New York (1971).
13. R.P.H. Gasser, W.G. Richards, Entropy and Energy levels, ELBS Edn., Oxford University Press (1974).
14. C.N.Banwell and E.M.McCash, Molecular Spectroscopy, Tata McGraw Hill, 4th Edn., (1995).
15. G. Aruldhas, "Molecular Structure and Spectroscopy", 2nd Edn., Prentice-Hall of India Pvt., Ltd., New Delhi (2007).
16. R.S.Drago, Physical Methods in Chemistry, W.B. Saunders Co., London (1977).
17. D.C. Harris and M.D. Bertolucci, Symmetry and Spectroscopy-An Introduction to Vibrational and Electronic Spectroscopy, Oxford University Press, New York (1978).
18. G.H.Barrow, Introduction to Molecular Spectroscopy, McGraw Hill.
19. R.Chang, Basic Principles of Spectroscopy, McGraw Hill, London (1976).
20. B.F. Straughan and S. Walker (eds.), Spectroscopy, Vol. 1, 2 and 3, Chapman & Hall, London (1976).
21. B.R. Puri, L.R. Sharma and M.S. Pathania, Principles of Physical Chemistry (Millennium Edn,) Vishal Publishing Co., (2003)

Semester - III - Part – III – Major Elective III

Medicinal and Pharmaceutical Chemistry
Hours per week: 4   Credits: 4

Subject Code: P1CHE31

Objectives:
- To get mastery overall the fundamentals of medicinal chemistry.
- To study the synthesis, mechanism, action and applications of various types of drugs.

Unit I: Fundamentals of Medicinal Chemistry **(12 hours)**

Definitions of Medicinal Chemistry, Pharmacology, drugs – Nature and sources of drugs, roots of administration of drugs – General principle of Drug action – drug action at an active site – factors affect the catalyst action like activation energy – catalytic role of enzymes

Receptor – Drugs – receptor bonding, Drug action at receptor – theories receptor – QSAR – Hansh approach, Craig plot – bioisosteres.

Unit II: Prodrugs, Agonist & medicinally useful antibiotics and hormones **(12 hours)**

Prodrugs, classification, design, bioprecursor and application. Structural features and mode of action of β-lactum antibiotics. agonist, design of agonist and its requirements – antagonist, design of antagonist – partial agonist. Biosynthesis of insulin and thyroid hormones

Unit III: Some important Chemotherapeutic agents. **(12 hours)**

Antineoplastic Agents: Classification, synthesis and assay eg: Chlorambucil, Busulphan, Methotrexate, 5-Flurouracil, Ifosfamide, and Cisplatin

Antitubercular drugs: Classification, synthesis and assay eg: Isoniazid, Rifampicin(assay only), Ethionamide, Pyrazinamine, Thiacetazone and *P*-Aminosalicylic Acid

Antimalarial drugs: Classification, synthesis and assay eg: Chloroquine, Mefloquine, Proquanil, Pyrimethamine and Amodiaquine

Unit IV: Synthesis, mechanism of action and uses of antihypertensive, antiviral and diuretics drugs. **(12 hours)**

Antihypertensive drugs: Methyldopa, Hydralazine, Propranolol, Nifedipine, Captopril.
Antiviral drugs: Acyclovir, Methisazone, Amantadine, Didanosine, Delaviridine
Diuretics: Furesemide, Acetazolamide, Chlorothiazide

Unit V: Synthesis, SAR and therapeutic uses of anti-inflammatory and CNS drugs.

(12 hours)

Anti-inflammatory drugs: Aspirin, Paracetamol, Phenylbutazone, Ibuprofen, Mefenamic Acid
CNS - Stimulant drugs: Amphetamine, Caffeine, Theobromine, Theophylline, Nikethamide.
CNS - depressant drugs: Phenelzine, Imipramine, Desipramine, Nortiptyline, Amitriptyline.

Suggested readings:
1. An introduction to Medicinal Chemistry, Graham L. Patrick, OXFORD UNIVERSITY PRESS, 1995.
2. Text book of Medicinal Chemistry, Volume I & II, K. Ilango and P.Valentina, Keerthi Publishers, 2007.
3. Medicinal Chemistry, D.Sriram and P.Yogeeswari, Pearson Education publishers, xxxxx.
4. Medicinal Chemistry, G.R.Chatwal, Himalaya Publishing House, 2002
5. A text book of Pharmaceutical Chemistry, Jeyashree Ghosh, S.Chand Publishers, xxxx.

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6. Medicinal Chemistry, Ashutosh Kar, New Age International Publishers, 2007.
7. *British Pharmacopoeia*

Semester - III - Part – III – Major Elective IV - Polymer Chemistry
Hours per week: 4   Credits: 4
Subject Code: P1CHE32

Objectives:
- To study the classifications and properties of different polymers
- To learn the various polymerization techniques.

Unit I: Classification of polymers and chemistry of polymerization   (12 hours)

Classification of polymers: Linear polymers, non-linear or branched polymers, cross – linked polymers, homo chain and hetero chain, homopolymers, co-polymers, block polymers and graft polymers.

Chemistry of polymerization: Types of polymerization – mechanism – chain, growth, free radical, ionic, co-ordination, ring opening, mathematical, group transfer, polyaddition and polycondensation polymerizations.

Unit II: Individual polymers   (12 hours)

Monomers required for general methods of preparation, repeat units and uses of the following polymers and resins – polyethylene, polystyrene, polyacrylonitrile, polymethylacrylate, PVC, polytetrafluoro ethylene, polyisoprenes, polybutadienes and polychloroprene, polyesters, polycarbonates, polyimides, polyamides (Kelvar), polyurethanes, polyethylene glycols, phenol-formaldehyde, urea-formaldehyde, melamine-formaldehyde and epoxy resins – silicone polymers.

Unit III: Properties of polymers   (12 hours)

Intrinsic properties – processing properties – article properties – basic idea of isomerism of polymers – configuration of polymer chain – geometrical structure – syndiotatic, isotatic and atatic polymers.

Glass transition temperature – Definition – factors affecting glass transition temperature – relationships between glass transition temperature and (a) molecular weight, (b) melting point and (c) plasticizer – importance of glass transition temperature – heat distortion temperature.

Molecular weight and size of polymers: Number average, weight average, sedimentation and viscosity average molecular weights – molecular weights and degree of polymerization – poly dispersity – molecular weight distribution in polymers – size of polymer molecules – kinetics of polymerization.

Unit IV: Polymerization techniques, degradation and uses of polymers   (12 hours)

Polymerization techniques: Bulk, solution, suspension, emulsion, melt condensation and interfacial polycondensation polymerizations.

Degradation: Types of degradation – thermal, mechanical, ultrasonic and photo degradation – photo stabilizers – oxidative degradation – antioxidants – hydrolytic degradation. Uses of polymers in electronics and biomedicine.

Unit V: Polymer processing   (12 hours)

Polymer processing – plastics (thermo and thermosetting), elastomers, fibres, compounding, plasticizers, colorants, flame retardants.

Compression and injection mouldings – film extrusion and calendaring – die casting and rotational casting – thermoforming – reinforcing.

Suggested readings:

1. V.R.Gowariker, N.V.Viswanathan and Jayadev Sreedhar, "Polymer Science", Wiley Eastern Ltd., New Delhi, 1986.
2. G.Odian, "Principles of Polymerization", 2nd edn., John Wiley and Sons, New York, 1981.
3. D.W.van Krevelen and P.J.Hoftyrager, "Properties of Polymers", Elsevier, New York, 1976.
4. B.K.Sharma, "Polymer Chemistry", Goel Publishing House, Meerut, 1989.
5. P.J.Flory, "Principles of Polymer Chemistry", Cornell Uni. Press, Ithaca, 1953.
6. F.W.Billmeyer, "Textbook of Polymer Science", 3rd edn., John Wiley and Sons, New Your, 1984.
7. Harry R.Allcock, F.W.Lampe and J.E.Mark, "Contemporary Polymer Chemistry", 3rd edn., Pearson, Prentice Hall, New Delhi, 2005.
8. J.A.Brydson, "Plastics Materials", 7th edn., Butterworth – Heinemann Publishers, New Delhi, 1999.

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9. R.J.Crawford, "Plastics Engineering"3rd edn., Butterworth – Heinemann Publishers, Singapore, 1999.

Semester - IV - Part – III - Core Subject X - Organic Chemistry IV
Hours per week: 5   Credits: 4
Subject Code: P1CHC41

Objectives:

- To get mastery over retrosynthesis.
- To study the structural elucidation of terpenes and streoids.
- To learn ORD, CD and chromatographic techniques.
- To get the basic knowledge in green chemistry.

Unit- I: Synthetic methods II   (15 hours)

Carbon–carbon bond forming reaction - Functional group interconversions diastereoselectivity – enantioselectivity – stereoselectivity – regioselectivity – retrosynthetic analysis – disconnection approach – basic principles – one group disconnection – two group C-X disconnections-1,2-, 1,4- and 1,5-di functionalized compounds – A schematic analysis of the total synthesis of the following compounds. 2,4–dimethyl–2–hydroxypentanoicacid, trans-9-methyl-1-decalone and isonootkatone

Unit-II: Chirooptical and analytical techniques   (15 hours)

ORD and CD – Principle – Cotton effect - type of ORD curves – axial α-haloketone rule – octant rule – applications to determine the configuration and conformation of simple monocyclic and bicyclic ketones – comparison of ORD and CD .

Chromatographic techniques:

Principle and Application of Column, TLC, Paper, GLC, HPLC, Exclusion and ion exchange Chromatography.

Unit- III: Terpenoids and steroids   (15 hours)

Terpenoids: Classification – Structural elucidation of α-pinene, camphor, zingiberene and cadinene, Biosynthesis of terpenoids

Steroids: Classification – Conformational aspects of A/B cis and A/B trans steroids, Chemistry of Cholesterol – male sex hormones – testosterone – female sex hormone – oestrone and progesterone – A basic idea about adreno cortical hormones

Unit- IV: Heterocyclic compounds and alkaloids   (15 hours)
Heterocyclic compounds:

Classification – Five and six membered heterocyclics – heterocyclics containing more than one hetero atoms. – Structure and synthesis of imidazole, thiazole, oxazole, pyridazine, pyrimidine, pyrazine, purine and uracil.

Alkaloids:

General methods of structural determination – Hofmann, Emde and VonBraun degradations, structural elucidation and synthesis of quinine, nicotine, and reserpine.

Unit- V: Green chemistry   (15 hours)

Principles of green chemistry – Planning a green synthesis in laboratory – general interest for solvent free processes – solvent free techniques – microwave synthesis. Introduction and characteristics of microwave heating – interaction of microwave radiation with the material – difference between conventional heating and microwave heating – applications and advantages of microwave heating over conventional heating

Reference books:

1. Robert E. Ireland, Organic Synthesis, Prentice – Hall of India Pvt. Ltd.1975

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2. Stuart Warren, Organic Synthesis, The disconnection approach, wiley student edition.
3. William Carruthers and Laincoldham, Modern methods of organic synthesis. Cambridge University press IV edition.
4. Francis A.Carey, Richard J. Sundberg, Advanced organic chemistry. Part-B Reactions and Synthesis, springer V edition
5. I.L.Finar, Organic chemistry, Vol.I, VI edition
6. I.L. Finar, Organic Chemistry, Vol.II, VI edition
7. E.L Eliel, Stereochemistry of Carbon Compounds, Mc Graw Hill.
8. O.P Agrawal. Organic Chemistry Natural Products Volume I, Goel Publishing House, Meerut
9. O.P. Agrawal Organic Chemistry Natural Products Volume II, Goel Publishing House Meerut
10. Gurdeep R. Chatwal, Organic Chemistry of Natural Products volume I , Himalaya Publishing House.
11. Gurdeep R. Chatwal, Organic Chemistry of Natural Products volume II, Himalaya Publishing House.
12. K.R. Desai, Green Chemistry (microwave synthesis)) Himalaya Publishing house.
13. A.K. Ahluwalia, Green Chemistry (Environmentally Benign Reactions) Aru Books India,
14. R. Sanghi and M.M. Srivastava, Green Chemistry (Environmental Friendly Alternatives), Narosa Publishing House.

Semester IV – Part III – Core Subject XI – Inorganic Chemistry IV
Hours per week: 5   Credits: 4
Subject Code: P1CHC42

Objectives:
- To study a overall review of nuclear chemistry
- To gain a detailed knowledge of lanthanides and actinides.
- To learn about the elecroanalytical, thermoanalytical and spectroanalytical methods.

Unit I – Nuclear Chemistry   **(15 hours)**

Types of nuclear reactions – spallation, fragmentation, transfer reactions - Buckshot hypothesis, fission and fusion – transmutation reactions - Nuclear Q value – Capture cross section – Threshold energy and excitation function.

Nuclear fission – mass distribution of fission products – liquid drop model for nuclear fission. Nuclear fusion - thermonuclear reaction in stars.

Nuclear reactor and its components: Nuclear materials – fissile and fertile isotopes - production of feed material for nuclear reactors – Nuclear waste disposal and radiation protection. Breeder reactor – Atomic power projects in India.

Unit II – Chemistry of lanthanides and actinides   **(15 hours)**

Lanthanides – occurrence, extraction from ores – separation procedure – ion exchange method – solvent extraction method. Physical chemical properties – electronic configuration – common oxidation state – lanthanide contraction and its consequences – colour of lanthanide ions – spectral and magnetic properties of lanthanides.

Actinides – separation of actinide elements – separation of Pu from fission products – electronic configuration – oxidation state – spectral and magnetic properties –comparison of lanthanides and actinides.

Unit III - Electroanalytical and Thermoanalytical methods   **(15 hours)**

Electroanalytical Techniques: Electrogravimetry: Theory of electrogravimetric analysis-electrolytic separation and determination of metal ions. Coulometry: Electrolytic cell-working

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electrodes-auxiliary electrode and reference electrode – coulometric titrations. Voltammetry: Cyclic voltammetry – stripping voltammetry – chronopotentiometry. amperometry: amperometric titrations.

Thermoanalytical methods: Instrumentation- applications of thermogravimetry-Differential thermal analysis and Differential scanning colorimetry.

Unit IV - Spectroanalytical methods   **(15 hours)**

Laws of absorption and quantitative law of luminescence – principles and applications of colorimetry and spectrophotometry, fluorimetry, nepheleometry and turbidimetry – emission spectroscopy and flame spectroscopy-atomic emission and atomic fluorescence spectroscopy. optical rotatory dispersion and circular dichroism of metal complexes.

Unit V –IR and Raman spectra and Mossbauer spectroscopy   **(15 hours)**

Application of IR and Raman spectra in the study of coordination complexes – application of metal carbonyls and nitrosyls – geometrical and linkage isomerism – detection of inter and intramolecular hydrogen bonding – stretching mode analysis of metal carbonyls.

Mossbauer spectroscopy: Mossbauer effect resonance absorption – Doppler effect Doppler velocity – Experimental technique of measuring resonance absorption – isomer shift – effect of quadruple nucleus – magnetic hyperfine splitting – Application of Mossbauer spectroscopy in the study of iron and tin complexes.

Reference books

1. J.E. Huheey, E.A. Keiter and R.L. Keiter,   Inorganic Chemistry Principles of Structure and Reactivity (4th edition): Addison-Wesley Publishing Company, New York, 1996.
2. F.A.Cotton and G.Wilkinson, Advanced Inorganic Chemistry (5th edition), John Wiley & Sons, New York, 1988.
3. J.D. Lee, Concise Inorganic Chemistry , 5th edition, Blackwell Science, 2000.
4. D.F.Shriver, P.W.Atkins and C.H.Langford, Inorganic Chemistry, 3rd edition, Oxford Univ. Press, 1999.
5. H.J. Arnikar Essentials of Nuclear Chemistry, 4th edition, New Age Publishers New Delhi, (2009).
6. S. Glasstone, Source book on Atomic energy, 3rd edition, East West Press, (1967).
7. H.D. Mathur and O.P. Tandon, Chemistry of Rare Elements, IV Edn., S.Chand & Co.,1986.
8. T.Moller, The Chemistry of Lanthanides, Chapman and Hall London (1963).
9. D.A. Skoog and D.M. West Principles of Instrumental Analysis, 2nd edition Saunders Publishers, New York, (1980).
10. 10 H. Willard L. Merit and J.A. Dean Instrumental Methods of Analysis, 7th edition, Wadsworth Pulishing Company, USA (1986).
11. J. G. Dick, Analytical Chemiostry, Tata-McGraw Hill, New Delhi, (1993).
12. R.S. Drago, Physical methods in Inorganic Chemistry , Van Nostrand Reinhold Co., New York (1965).
13. K. Veera Reddy Symmetry and Spectroscopy of Molecules 2nd edition New Age Publishers New Delhi, (2010).

Semester - IV - Part – III - Core Subject XII - Physical Chemistry IV
Hours per week: 5   Credits: 4
Subject Code: P1CHC43

Objectives:

- To learn the physical chemistry background for various spectral techniques.
- To study the properties of colloids and surface chemistry

- To get a detailed knowledge in photochemistry.
- To study the role of physical aspects of some biological process

Unit I: **Spin Resonance Spectroscopy** (15 hours)

Magnetic properties of nuclei- Resonance condition - NMR instrumentation- Relaxation processes- Bloch equations- chemical shift - spin-spin splitting, relaxation times, line shape and line width analysis. Experimental techniques in NMR- double resonance technique- ENDOR, Overhauser effect, FT-NMR spectroscopy.

EPR- Principle of EPR- total Hamiltonian- Hyperfine structure- EPR of hydrogen atom- splitting in isotropic systems involving more than one nucleus- EPR spectra of free radicals in solution- methyl radical, benzene anion, p-benzosemiquinone radical anion, p-nitrobenzoate dianion and naphthalene anion.

Unit II: **NQR and Photoelectron Spectroscopy.**   **(15 hours)**

Nuclear Quadrupole Resonance (NQR) spectroscopy- The quadrupole nucleus-Principle of NQR- Transitions for axially and non-axially symmetric systems-Applications of NQR- Halogen, minerals and nitrogen- group frequencies-hydrogen bonding.

Photoelectron Spectroscopy- XPS- chemical shifts- Koopmans'theorem- UVPES- X-ray fluorescence- Auger process and its applications.

Theory – XPS – UV-PES – instrumentation-evaluation of ionization potential – Chemical identification of element – Koopmans's theorem – Chemical shift – UPS – XPES of N_2, O_2 and HCl – evaluation of vibrational constants from UPS – spin – orbital coupling – Auger spectroscopy – principle and its application

Unit III: **Colloids and Surface Chemistry**   **(15 hours)**

Colloids: Different colloidal systems- characteristics of true solutions, colloidal solutions and suspensions- General properties of colloidal systems-coagulation, flocculation or precipitation of colloidal solution- Protective colloids- Gold number- Hardy-Schulze rule-Hofmeister series- Electrokinetic phenomena including electro-osmosis and electrophoresis- Emulsions- Gels - Importance and applications of colloids.

Surface Chemistry: Introduction- Adsorption of gases on solids- physisorption and chemisorption- adsorption isotherms- Freundlich- Langmuir- BET – Temkin adsorption isotherms- Adsorption on liquid surface- surface tension- Gibbs adsoption isotherm- surface area determination

Unit IV: **Photochemistry**   **(15 hours)**

Physical properties of the electronically excited molecules- excited state dipole moments, acidity constants (pKa^*-values) and redox potentials. Intermolecular deactivation of excited states- photosensitized reactions- Photophysical kinetics of intermolecular processes- Stern-Volmer equation and its applications- Excimer and excited state dimers.

Tools and techniques in photochemistry - light sources and their standardisation- chemical actinometry- conventional photolysis procedure. Measurements of emission characteristics- emission and excitation spectra- measurement of quantum efficiency- determination of decay constants or radiative lifetimes. photochemical conversion and storage of solar energy.

Unit V: **Biophysical Chemistry**   **(15 hours)**

Basic concept of non-equi1ibrium thermodynamics – Onsager reciprocal relationship- Bioenergetics and metabolism-catabolism-anabolism-Energy relationship between catabolic and anabolic pathways- High energy metabolites - ATP and its role in bioenergetics – phosphoryl group transfers and ATP- Role of singlet oxygen in biology- Biophysical applications of Mossbauer effect- Mossbauer effect in heamoglobin- Molecular recognition- an introduction to supra-molecular chemistry.

Recommended Books

1.   G. Aruldhas, "Molecular Structure and Spectroscopy", Prentice-Hall of India Pvt., Ltd., New Delhi (2001).
2.   G.R. Chatwal, S.K. Anand, Spectroscopy (Atomic and Molecular), Himalaya Publishing House, Mumbai, (2009).
3.   P.Atkins, J. De Paula, Atkins' Physical Chemistry, Oxford University Press, New York, (2006).
4.   G.K. Vemulapalli, Physical Chemistry, PHI Learning Pvt., Ltd., New Delhi (2009).
5.   R.S.Drago, Physical Methods in Chemistry, W.B. Saunders Co., London (1977).
6.   E.B.Becker, High Resolution NMR, 2nd edn,"Academic Press, (1990).
7.   E.A.V. Ebsworth, D.W.H. Rankin, S.Cradock, "Structural Methods in Inorganic Chemistry", English Language Book Society / Black well Scientific Publications, (1987).

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8. B.Viswanathan, S. Sundaram, R. Venkataraman, K. Rengarajan and P.S. Raghavan, "Electrochemistry-Principles and Applications" S. Viswanathan Printers and Publishers Pvt., Ltd., (2007).

9. D.A. Skoog, D.M. West and F.J. Holler, "Fundamentals of Analytical Chemistry", 7th Edn., Sannnders Colllege Publishing, New York (1996).

10. D.A.Skoog, F.J.Holler and T.A.Nieman, "Principles of Instrumental Analysis", 5th Edn., Harcourt College Publishers (1998).

11. D.J.Shaw, Introduction to Colloid and Surface Chemistry, Butterworth & Co. (Publishers) Limited (1968).

12. B.R. Puri, L.R. Sharma and M.S. Pathania, Principles of Physical Chemistry (Millennium Edn,) Vishal Publishing Co., (2003).

13. A.W. Adamson, Physical chemistry of surfaces, 5th Edn., John-wiley & Sons, New York (1990).

14. D. Attwood and A.T. Florence, Surfactant systems- Their chemistry, pharmacy and biology, Chappmann and Hall, New York (1983).

15. K.K. Rohatgi-Mukherjee, Fundamentals of photochemistry, Wiley Eastern New Age International (P) Limited, Publishers, (1986).

16. J. Rajaram and J.C. Kuriakose, Kinetics and mechanisms of chemical transformations Applications of Femtochemistry, Macmillan India Ltd., (2008).

17. N.J. Turro, Modern Molecular photochemistry, Benjamin Cummings, (1965).

18. C. Kutal, Photochemical conversion and storage of solar energy, Journal of Chemical Education, **60**, (1983) p. 882-887.

19. J. Rajaram and J.C. Kuriakose, Thermodynamics for students of chemistry, Shoban Lal Nagin Chand & Co., (1986).

20. D.A. McQuarrie and J. D. Simon, Molecular Thermodynamics, Viva Books Pvt., Ltd., New Delhi (2004).

21. M.M. Cox, D.L. Nelson, "Lehninger Principles of Biochemistry" 5th Edn., W.H. Freemman & Co., (2008).

22. Dickson, Dominic P.E. and Frank J. Berry, eds. Mössbauer Spectroscopy. Cambridge University Press, New York: 1986.

23. U. Gosner and R.W. Grant, "Mossbauer Effect in Hemoglobin and Some Iron-Containing Biological Compounds." *Biophysical Journal* (5) (1965) p. 823-844.

24. Michael I Oshtrakh, "Mossbauer Spectroscopy in Biomedical Research", *Faraday Discussions,* **126** (2004) p.119-140.

Semester - IV - Part – III – Major Elective V - Computer Applications
Hours per week: 4   Credits: 4
Subject Code: P1CHE41

Objectives:
- To study the basics and applications of VB in chemistry.
- To learn about the basic concepts of communication systems.
- To get an idea about the applications of internet in chemistry.

Unit I: Basic concepts of VB   **(12 hours)**

Introduction to Visual Basic – the integrated development environment – the menu bar, the tool bar, the project explorer, the tool box, the properties of window, the form designer, the form layout, the immediate window, the elements of the interface – programming an application common properties, common methods and common events – customizing the environment.

Working with forms: The appearance of form – the start up form – loading, showing the hiding forms – elementary concepts of drag and drop operations.

Basic active X controls: Elementary concepts of the text box control, the List box and ComboBox controls.

Variables – declaring variables – variable types – strings, numeric and data variables scope and life forms of variables – constants.

Unit II: The Language forms and basic active controls   **(12 hours)**

Control flow statements: If … Then …. Else.

Loop Statements: Do….. Loop, For….Next and While – Wend-nested control statement – the exit statement.

Arrays: Declaring arrays – specifying arrays – multidimensional arrays.

Procedures: Subroutines, functions, calling procedures – arguments – arguments passing mechanism – using optional arguments – functions returning arrays

Unit III: Applications of VB in Chemistry   **(12 hours)**

Writing Simple programs in Chemistry

1. Calculation of molecular weight of organic compound,
2. Ionic strength of an electrolyte,
3. Different velocities of a gas,
4. NMR frequency values of nuclei,
5. Average rate constant,
6. Unit cell dimension,
7. Thermodynamic parameters
8. Reduced mass
9. Empirical formula of an organic compound containing C, H, and O
10. Normality , molality and molarity of a solution
11. 7Half life period of a radioactive material
12. Surface tension and
13. Temperature in Kelvin scale into Celsius scale and *vice - versa*

Practical: (Class work only)

Construction of programs in VB language, compiling, debugging and making executive files, printing the output.

Running simple VB programs in chemistry to calculate / determine the above problems.

Unit IV: Basic concepts of communication systems   **(12 hours)**

Communication systems: Satelites – RADAR – optical fibers – advantages and disadvantages – ISDN – distributed systems – advantages and disadvantages.

Telecommunication: analog and digital signals – types and needs of modulations – MODEMS – telecommunication software.

Computer networks: an overview – communication processors – protocols – network architecture.

Practicals (Class work only)

1. Salient features of windows and MS Word for typing texts and equations in Chemistry – tabular columns – advanced concepts.

2. Basic concept of creating and accessing databases using MS access.

3. Significance of Chemdraw – drawing chemical structures and pasting them in the text.

Unit V: Basic concepts of internet and applications in chemistry **(12 hours)**

Internet: History of internet – the working way of internet – getting connected to internet – internet protocols – internet addressing – domain names – internet services.

WWW: Web pages – home pages – web browsers – search engines – internet chat – chatting on web.

E-mail: Introduction – working way – mailing basics – e-mail ethics – advantages and disadvantages – creating e-mail – receiving and sending e-mails.

Intranet: Characterisation – advantages – drawbacks – need for intranet – extranet.

Application of internet in chemistry: Websites in literature survey in Chemistry – popular websites in chemistry – databases in chemistry – URLS – WAIS – downloading the attachment / PDF files – opening, browsing and searching a website – literature searching online.

Practical (Class work only)

Creating e-mail id, sending and receiving e-mails, attachment files, pDF files. Opening, browsing and searching a website – downloading – literature survey in chemistry – online searching.

Suggested Readings:

1. Evangelos petroutsos, Mastering "Visual Basic 6" BPB publication, First Indian Edition, New Delhi, 1998, pp 1-51, 99 -174, 177-180, 209-211, 227-262.
2. David Jung, Pierre Boutquin, John D. Conley III, Loren Eidahl, Lowell Mauer and Jack Pudum, "Visual Basic 6 super bible" First Indian Edition, Techmedia, New Delhi, 1999.
3. Gary Cornel, "Visual Basic 6" Tat-McGraw Hill, New Delhi, 1998.
4. Barbara Kasser, " Using the internet" Fourth edition, EE Edition, New Delhi, 1998.
5. K.V.Raman. " Computers in Chemistry" Tata-McGraw Hill publishing Company, New Delhi, 1993.
6. Alexis Leon and Mathews Leon, "Fundamentals of Information Technology", (Chapters 17-19 & 21-23), Leon Vikas, Chennai (1999).

Semester - IV - Part – III – Major Elective VI - Introduction to Nanoscience
Hours per week: 4   Credits: 4
Subject Code: P1CHE42

Objectives:

- To get knowledge about synthetic methods and properties of nanomaterial.
- To study the characterization of nanomaterial.

Unit I: General Introduction **(12 hours)**

Forms of Matter – crystal structures – electronic properties of atoms and solids – Surface energy and surface tension – Defining nanodimensional materials – 0D, 1D and 2D nanostructures – size dependence of properties – Special properties resulting from nanodimensionality – potential uses of nanomaterials.

Unit II: Synthesis of Nanomaterial **(12 hours)**

General approaches – Nucleation process – Size of the crystal – Influence of nucleation rate on the size of the crystal – Chemical methods – Sol-gel techniques – Control of grain size – Co-precipitation – Hydrolysis – Sonochemical method – Colloidal precipitation – Bottom up and top down approaches – kinetically confines synthesis of nanoparticles .

Unit III: Principle and Applications **(12 hours)**

Spectrometry, XRD, SEM, TEM, AFM – Application to nanomaterials characterization.

Unit IV: Optical Properties of nanomaterials **(12 hours)**

UV-Vis, IR absorption – photoluminescence and stimulated emission – nonlinear optical mixing – photoconductivity.

Magnetic properties: Concepts of dia-, para-, and ferro-magnetism – Exchange correlation – Exchange interaction.

Electrical Properties: Electrical conductivity – Hall Effect – Charge carrier density – Activation energy; Electronic properties – Field emission properties.

Unit V: Biological nanomaterials **(12 hours)**

Sizes of building blocks – proteins – DNA double nanowire – Enzymes – Protein synthesis – Micelles and vesicles – Biomimetic nanostructures – Worm micelles and Vesicles from block copolymers.

Suggested Readings

1. C.P. Poole Jr., F.K. Owens, Introduction to Nanotechnology, John Wiley & sons, 2003.
2. M.D. Ventra, S.Evoy, J.R. Heflin, Jr., (Eds) Introduction to Nanoscale Science and Technology, Kluwer Academic 2004.
3. G. Cao., Nanostructures and nanomaterials: synthesis, properties and applications, Imperial College press.
4. C.N.R. Rao, A. Muller, A.K. Cheetham (Eds), The Chemistry of Nanomaterials: Synthesis, Properties and Applications, Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim, 2004.
5. P.Knauth, J. Schoonman (Eds), Nanostructured Materials: Selected Synthesis Methods, Properties and Applications, KLUWER ACADEMIC, 2002.

Part III – Core Lab IV – Organic Chemistry Practical
Hours per week: 4 Credits: 4
Subject Code: P1CHC4P1

Quantitative Analysis and Organic Preparations

Objectives:

- To prepare some organic compounds (2 stages) and to practice the separation of mixtures of organic compounds by chromatographic techniques.
- To estimate some organic compounds with reference to their functional groups.

1. Quantitative analysis:
   (a) Estimation of glucose by Lane and Eynon method and Bertrand method.
   (b) Estimation of glycine
   (c) Estimation of formalin
   (d) Estimation of methyl ketone
   (e) Estimation of unsaturation (cinnamic or maleic acid)
   (f) Determination of equivalent weight of an acid
   (g) Chromatographic methods: Column, paper and TLC.

2. Organic preparations:
   (a) *p*-Bromoaniline from acetanilide
   (b) *p*-Nitroaniline from acetanilide
   (c) m-nitrobenzoic acid from methyl benzoate
   (d) Benzoin $\rightarrow$ benzil $\rightarrow$ benzilic acid
   (e) Sym-Tribromobenzene from aniline
   (f) 2-Phenylindole from phenyl hydrazine and CH_3COPh
   (g) Benzophenone $\rightarrow$ benzpinacol – pinacolone (Photochemical reaction – class work only)

(h) Acetophenone $\rightarrow$ chalcone $\rightarrow$ chalcone epoxide

(i) Glycine $\rightarrow$ N-phenylglycine – N-nitroso-N-phenylglycine

(j) Benzophenone $\rightarrow$ oxime $\rightarrow$ anilide

(k) Hydroquinone $\rightarrow$ diacetate $\rightarrow$ - 2,5-dihydroxy acetophenone

(l) Benzoquinone $\rightarrow$ benzoquinone – anthracene adduct $\rightarrow$ dihydroxy triptycine

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Part III – Core Lab V – Inorganic Chemistry Practical
Hours per week: 4 Credits: 3
Subject Code: P1CHC4P2

Quantitative analysis and Inorganic Preparation

Objectives:

- To practise quantitative estimation of more than one cation opting volumetric and grametric estimations.
- To practise the preparation of simple co-ordination compounds.
- To study the basics of photo colorimetric estimation of metals.

Quantitative estimation of a mixture containing two metal ions (volumetric and gravimetric estimations)

Estimation of Cu^{2+} and Ni^{2+}
Estimation of Cu^{2+} and Zn^{2+}
Estimation of Fe^{2+} and Cu^{2+}
Estimation of Fe^{2+} and Ni^{2+}
Estimation of Ca^{2+} and Mg^{2+}
Estimation of Ca^{2+} and Ba^{2+}
Analysis of ores and alloys (course work only)

Quantitative estimation of a mixture containing three metal ions. One metal ion is to be estimated volumetrically and others by gravimetrically (course work only)

Photocolorimetric estimation of metal ions (course work only)

Inorganic Complexes Preparation

Preparation of atleast 10 (ten) inorganic complexes.

For examination a mixture will be given from which one caption is to be estimated volumetrically and the other gravimetrically.

Part III – Core Lab VI – Physical Chemistry Practical
Hours per week: 3 Credits: 4
Subject Code: P1CHC4P3

Objectives:

- To study the validity of adsorption isotherm.
- To train the students to arrive at rate constant of a reaction.

VIRUDHUNAGAR HINDU NADARS' SENTHIKUMARA NADAR COLLEGE

(An Autonomous Institution Affiliated to Madurai Kamaraj University)

[Re-accredited with 'A' Grade by NAAC]

Virudhunagar – 626 001

- To quantitatively estimate ions by potentiometric methods.
- To get acquainted with UV- Visible and IR experiments.

I. **Adsorption Experiments**
   1. Adsorption of oxalic acid on charcoal
   2. Adsorption of acetic acid on charcoal

II **Kinetic experiments**
   1. Kinetics of alkaline hydrolysis of ester by conductivity method

III **Potentiometric methods**
   1. Precipitation titration: Ag^+ *vs* halide mixture
   2. Redox titrations: a) permanganate *vs* iodide ion
      b) ceric ammonium sulphate *vs* ferrous ion
      c) permanganate *vs* ferrous ion
      d) dichromate *vs* ferrous ion.
   3. Determination of dissociation constant of weak acids
   4. Determination of pH of buffer solutions
   5. Determination of solubility product of sparingly soluble salts.

IV **Titrations using pH meter**
   Determination of first, second and third dissociation constants of phosphoric acid.

V **Experiments based on UV-Visible and Infrared spectrophotometers**.

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Course Name: Bachelor of Science

Discipline   : Botany

Course scheme

Sem	Part	Subject	Hr	Cr	Int+Ext	Tot	Code	Revision
III	Part I	**Tamil III/Hindi**	6	3	25+75	100	U1PT31/ U1PH31	Revised
	Part II	**English III**	6	3	25+75	100	U1PE31	Revised
	Core - III	**Fungi, Lichen & Plant pathology**	4	4	25+75	100	U1BYC31	Revised
	Core Practical - III	**Lab:Fungi, Lichen & Plant pathology**	2	2	40+60	100	U1BYC3P1	Revised
	Allied (a) - III	**Chemistry**	4	2	25+75	100	U1CHA3X3	Revised
	Allied (a) - Practical III	**Lab:Chemistry**	2	-	-	-	---	No Change
	Allied (b) - I	**Zoology**	4	2	25+75	100	U1ZYA3X1	Revised
	Allied (b) - Practical I	**Lab:Zoology**	2	-	-	-	---	-

Sem	Part	Subject	Hr	Cr	Int+Ext	Tot	Code	Revision
IV	Part I	**Tami IV/Hindi**	6	3	25+75	100	U1PT41/ U1PH41	Revised
	Part II	**English IV**	6	3	25+75	100	U1PE41	Revised
	Core - IV	**Pteridophytes & Gymnosperms**	4	5	25+75	100	U1BYC41	Interchanged and Revised
	Core Practical - IV	**Lab: Pteridophytes & Gymnosperms**	2	2	40+60	100	U1BYC4P1	Revised
	Allied (a) - IV	**Chemistry**	4	2	25+75	100	U1CHA4X4	Revised
	Allied (a) - Practical IV	**Lab:Chemistry**	2	4	40+60	100	U1CHA4PX	No change
	Allied (b) - II	**Zoology**	4	2	25+75	100	U1ZYA4X2	Revised
	Allied (b) - Practical II	**Lab:Zoology**	2	4	40+60	100	U1ZYA4PX	Revised

Year	Part	Subject	Hour	Credit	Int=Total	Code
I & II	Part V	NSS/ NCC/ Physical Education – Sports	-	1	100	U1NS1/ U1NC1/ U1PS1

SYLLABUS FOR EACH PAPER:

Third Semester
CORE – III – Fungi, Lichen and Plant pathology

Hours/week: 4   **Subject Code:** U1BYC31

Credit: 4

Course objectives:
- ➢ To study the morphology and reproduction of major classes of fungi.
- ➢ To study fungal, bacterial and viral diseases and control measures.
- ➢ To know about the classification of fungi and lichens.
- ➢ To acquire knowledge about the role of fungi.
- ➢ To acquire knowledge on the diseases caused by fungi in human beings.
- ➢ To make the students know about the types, structure and reproduction in lichens.

UNIT – I   **(12-hours)**

General characters and classification of fungi based on Alexopoulos and Mines. Role of fungi as food, medicine and growth regulators. Role of fungi in industries. Diseases in humans-Dermatophytes, Aspergillosis.

UNIT – II   **(12-hours)**

Occurrence, structure, reproduction and life cycle of the following:
- a) Phycomycetes – *Rhizopus*
- b) Ascomycetes - *Aspergillus*
- c) Basidiomycetes - *Agaricus*
- d) Deuteromycetes- *Alternaria*

UNIT – III   **(12-hours)**

General characters , types , somatic structures – soredia and isidia, economic importance of Lichens. Structure and reproduction of *Usnea.*

Unit – IV   **(12-hours)**

Classification of plant diseases ,Symptoms of plant diseases- bacterial, fungal and viral , Control of plant diseases – Fungicides and biocontrol- Forecasting of plant diseases.

UNIT – V   **(12-hours)**

Study of the etiology, symptoms and control measures of the following diseases:
1) Citrus canker 2) Tikka disease of Groundnut 3) Red rot of Sugarcane
4) Wilt of Cotton 5)Bunchy top of Banana

Text Books:

➢ Text book of Fungi O.P Sharma, 1998. Tata McGrew Hill Publishing Co. New Delhi.

➢ Plant Pathology – B.P Pandey, 2001. S. Chand & Company.

➢ Text Book of Microbiology- R. C. Dubey, D.K. Maheshwari, 2008. S. Chand & Company Limited, New Delhi.

Reference Books:

➢ Dubey, R.C. and Maheswari, D.K. 2000. A Text Book of Microbiology. S.Chand & Co Ltd. New Delhi.

➢ Kumar, H.D. and Swati Kumar, 1999. Modern Concepts of Microbiology. Vikas Publishing House Pvt, Ltd. New Delhi.

➢ Mehrotra, R.S. 2000. Plant Pathology. Tata McGrew Hill Publishing Co. New Delhi.

➢ Rangaswamy, G. 1992. Disease of crop plants in India. Prentice Hall of India, New Delhi.

➢ Vashishta, P.C and Gill, P.C. 1998. Plant Pathology. Pradeep Publications, Jalandhar.

➢ Introductory Mycology – C.J Alexopoulos, Charles W. Mims, M.Blackwell,2002. 4th Edition. Wiley India Pvt. Ltd. New Delhi.

➢ Plant Pathology – R.S Mehrotra, 2nd Edition, 2003. Tata McGrew Hill Publishing Co. New Delhi

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Core Practical – III Fungi, Lichen and Plant Pathology

Hours/week: 2   **Subject Code:** U1BYC3P1
Credit: 2

1. Make suitable temporary micro preparations of A & B. Submit the slides for valuation. Identify, draw diagram and give reasons.   2 x 10   = 20
2. Comment on the etiology of C and D   2 x 7 ½ = 15
3. Identify, draw diagrams and write critical notes E,F and G   3 x 5   = 15
4. Submission of observation note book   10

Practical syllabus:

➢ Observation of slides – *Rhizopus, Aspergillus*

➢ Study of external and internal structure of the basidiocarp in *Agaricus*.

➢ Study of the infected region of the groundnut leaves.

➢ Study of external and internal morphology of *Usnea.*

➢ Study of the etiology of bacterial, fungal and viral diseases prescribed in the syllabus.

Key and Scheme of Valuation

1. A-Fungi, B-Lichen

     Slide – 3 marks; identification-1 mark, diagram -3 marks, notes-3 marks

2. C and D – Pathology (specimen or photograph)

Identification – 1 mark , diagram 2 ½ marks, causal organism – 1 mark,

symptoms – 2 marks, control measures – 1 mark

3. E & F –Fungi, G – Lichen

Identification – 1 mark, diagram – 2 marks, notes – 2 marks.

Fourth Semester
Core-1V   Pteridophytes and Gymnosperms

Hours/week: 4   **Subject Code: U1BYC41**
Course objectives:
- ➢ To understand the salient features and the importance of Pteridophytes.
- ➢ To provide knowledge about the structure and reproduction in Pteridophyte and Gymnosperms.
- ➢ To impart knowledge about the fossil ferns..

Credit: 5
Unit I   **(12-hours)**

General characters, Classification of Pteridophytes(G.M Smith).
Structure and reproduction of *Psilotum* (Developmental sex organs need not be discussed)
        Economic importance of Pteridophytes
Unit II   **(12-hours)**
     Structure and   reproduction of the following: (Development of sex organs need not be discussed)
        a) Lycopodiales –*Lycopodium*
        b) Equisetales – *Equisetum*
        c) Marsiliales – *Marsilea*
Unit III   **(12-hours)**
        Classification of Gymnosperms(Chamberlin).
        Structure and reproduction of *Pinus* (Development of sex organs need not be discussed)
Unit IV   **(12-hours)**
        Structure and reproduction of *Gnetum* (Development of sex organs need not be discussed)
        Economic Importance of Gymnosperms.
Unit V   **(12-hours)**
        General classification of geological era – Fossilization and types of fossils – Brief study of the following
        a) Psilotales – *Rhynia*
        b) Cycadofilicales – *Lyginopteris*
Text Books:
Dr.Annie Ragland and Prof .V.Kumaresan (2002)– Pteridophytes Gymnosperms & Paleobotany.
Pandey B.P(2006). A text book of Botany (Bryophyta, Pteridophyta & Gymnosperms)

Reference Books:

Sporne. K.R(1975) – Morphology of Pteridophytes.

Parihar, N.S(1965) - An Introdution to Embryophyta Vol II (Pteridophytes)

Chopra, G.L(1992) – Gymnosperms.

Sporne K.R(1965) – The Morphology of Gymnosperms.

Shukla and Misra (1986) – Essential of Paleobotany.

Core Practical – IV – Pteridophytes and Gymnosperms

Hours/week: 2   **Subject Code: UIBYC4P1**

Credit: 2

1. To make suitable micro preparation of the types prescribed in Pteridophytes, Gymnosperms.
2. To observe and identify the macroscopic specimens.
3. To observe and identify the fossil slides included in the syllabus.
4. Preparation of Permanent Slide (Two slides)

Pteridophytes and Gymnosperms

Question Pattern   **Max Marks- 60**

Time: 3 Hours

1. Make Suitable temporary micro preparation of "A" and "B".
   Mount it in glycerin and submit the slides for valuation.
   Draw diagrams, identify and give reasons   **2 x 10= 20 marks**
2. Identify   the geological era, draw diagrams and write notes on 'C'   **1X 6= 6 marks**
3. Write critical notes on D, E, F and G   **4 X 6 =24 marks**
4. Submission of two permanent slides   **5 marks**
5. Submission of record note book   **5marks**

Key and Scheme of valuation:

1. A and B – Pteridophyte , Gymnosperms.
   Slide – 4marks, identification – 1mark, Diagram – 2marks and Notes – 3 marks
2. C – Fossil slide
   Identification – 1mark, Geological era – 1 mark, Diagram – 2marks and Notes – 2 marks.
3. D,E, F & G –   D,E- Pteridophytes
                    F,G- Gymnosperm
   Identification – 1mark, Diagram – 2marks and Notes – 3 marks
4. Submission of two Permanent slides - 5marks
5. Submission of Record note book   -5marks

Course Name: Master of Science

Discipline   : Botany

Course Scheme:

Semester	Part	Subject	Hour	Cr	Int+Ext= Total	Code	Revision
III	Core 11	**Microbiology, Fungi and Plant Pathology**	6	4	25+75=100	P1BYC31	**Revised**
	Core 12	**Biotechnology**	5	4	25+75=100	P1BYC32	**Revised**
	Core 13	**Biochemistry**	6	4	25+75=100	P1BYC33	**Revised**
	Core 14	**Lab V – Microbiology, Fungi and Pl. Pathology and Biotechnology**	4	3	40+60=100	P1BYC3P1	**Revised**
	Core 15	**Lab VI - Biochemistry**	4	3	40+60=100	P1BYC3P2	**Revised**
	Elective II	**Biodiversity &Conservation**	5	5	25+75=100	P1BYE31	
IV	Core 16	**Plant Physiology**	5	4	25+75=100	P1BYC41	**Revised**
	Core 17	**Bioinformatics and Biostatistics**	5	4	25+75=100	P1BYC42	**Revised**
	Core 18	**Developmental Botany**	5	4	25+75=100	P1BYC43	
	Core 19	**Lab VII –Plant Physiology**	4	3	40+60=100	P1BYC4P1	**Revised**
	Core 20	**Lab VIII-Bioinformatics and Biostatistics, Developmental Botany**	5	3	40+60=100	P1BYC4P2	**Revised**
	Project	**Project work**	6	5	40+60=100	P1BY4PV	**New**

Third Semester
Core 11 - Microbiology, Fungi and Plant pathology

Hours/week: 6   **Subject Code: P1BYC31**

Credit: 4

Course objectives

    1. To know the contributions of microbiologists.

    2. To learn about the structure of bacterial cell, growth of bacteria and bacterial culture techniques.

    3. To understand Bergey's manual of bacterial classification.

    4. To understand factors affecting microbial growth.

    5.To acquire knowledge on the characteristics of viruses.

    6. To study the morphology and reproduction of major classes of fungi.

    7. To study fungal, bacterial and viral diseases and control measures.

Unit I   **(18-hours)**

    Early development of microbiology – contributions of Anton Van Leeuwenhoek, Louis Pasteur, Joseph Lister, Robert Koch and his postulates. General characteristics of bacteria -

morphological, cultural, biochemical and serological characteristics. Ultra structure of Bacterial cell, capsule, flagella, pili, cell membrane, nucleoid, mesosome, ribosomes, plasmids – Cell wall chemistry and biosynthesis.Endospore-structure,sporulation and its significance.

Unit II (18-hours)

Bergey's classification of Bacteria, Nutritional types of Bacteria, Growth and multiplication of bacteria, Bacterial growth curve, generation time, Batch culture, Continuous culture and Synchronous culture. Methods of measurement of bacterial growth. Factors affecting bacterial growth,.

Unit III (18-hours)

Viruses – Classification based on the morphology of Plant Viruses. Structure and multiplication - Bacteriophages and Cyanophages. Viroids and Prions.Structure and Properties of HIV

Unit IV (18-hours)

General characteristics of fungi. Classification of fungi based on Alexopoulos and Mims Study of somatic and reproductive structures of the following classes: Zygomycetes, Ascomycetes, Basidiomycetes & Deuteromycetes. Significance of fungi. Fungal Barcoding(Brief account).

Unit V (18-hours)

Classification and symptoms of plant diseases. Mechanism of infection. Defence mechanism through – structural changes, production of secondary metabolites (phenolics and phytoalexins), plant defence genes (Tomato Pto gene, Tobacco gene, Rice Pi-ta gene) and RNA silencing. Plant diseases: Downy mildew of Grapes, Banana leaf spot, Rust diseases of wheat, Citrus canker, Tomato spotted wilt and Root knot by Meloidogyne.

Text Books:
- The Fungi. (2nd Edition)2010 . Geeta Sumbali Narosa Publishing house, New Delhi.
- Text book of Fungi O.P Sharma, 1998. Tata McGrew Hill Publishing Co. New Delhi.
- Plant Pathology – B.P Pandey, 2001. S. Chand & Company.
- Plant Pathology – P.D Sharma, 2006. Narosa publication, New Delhi.
- Text Book of Microbiology- R. C. Dubey, D.K. Maheshwari, 2008. S. Chand & Company Limited, New Delhi.
- Foundation in Microbiology 2nd Edition by Kathleen Talaro &Arthur Talaro 1996. Brown Publishers, USA.

Reference Books:
- Atlas, M. and Bartha, R.2000. Microbial Ecology. Addison Wesley Longman, Inc, New York.
- Black, J.G. 1999. Microbiology – Principles and Explorations. Prentice Hall, New Jersey.
- Brock, T.D., 1996, Biology of Micro-organisms, Prentice Hall.
- Casida, L.E. 1997, Industrial Microbiology. New Age International Publishers, New Delhi.
- Dubey, R.C. and Maheswari, D.K. 2000. A Text Book of Microbiology. S.Chand & Co Ltd. New Delhi.
- Kumar, H.D. and Swati Kumar, 1999. Modern Concepts of Microbiology. Vikas Publishing House Pvt, Ltd. New Delhi.

- Lydyard, P.M. et al 1999. Instant notes in immunology. Viva books Pvt.ltd. New Delhi
- Pelezar, M.J Chan, E.C.S and Krieg, N.R.1993. Microbiology-concepts and Applictions. McGrew Hill, Inc. Newyork.
- Stainer, R.Y et al., 1990. The Microbial World. Prentice Hall.
- Mehrotra, R.S. 2000. Plant Pathology. Tata McGrew Hill Publishing Co. New Delhi.
- Rangaswamy, G. 1992. Disease of crop plants in India. Prentice Hall of India, New Delhi.
- V Singh, R.S.1991. Plant Disease. Oxford IBH. New Delhi.
- Singh, R.S.1994. Introduction to the Principles of Plant Pathology. Oxford IBH. New Delhi.
- Vashishta, P.C and Gill, P.C. 1998. Plant Pathology. Pradeep Publications, Jalandhar.
- Wheeler, B.E 1972. An Introduction to Plant Disease. John Wiley & sons. Newyork.
- Alexopoulos, C.J., Mims, C.W., Blackwell, M.1996. Introductory mycology. John Wiley & sons. Newyork.
- Introductory Mycology – C.J Alexopoulos, Charles W. Mims, M.Blackwell,2002. 4th Edition. Wiley India Pvt. Ltd. New Delhi.
- Plant Pathology – George, N Agrios, 2005. Academic Press California, USA.
- Plant Pathology – R.S Mehrotra, 2nd Edition, 2003. Tata McGrew Hill Publishing Co. New Delhi.
- Microbiology 9th Edition , 2008- J.Tortora., R.Funkel. Case Published by Dorling Kindersley Pvt. Ltd. South Asia

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CORE 12- Biotechnology

Hours/week: 5   **Subject Code: P1BYC32**

Credit: 4

Course objectives:

1. To provide students with a solid foundation in the rapidly expanding field of biotechnology

2. To enhance the knowledge about the applications of modern biotechnology for the industrial production with waste minimization and reduced energy consumption.

Unit I   **(18-hours)**

Scope – definition, multidisciplinary approach of biotechnology. Recombinant DNA technology – molecular tools – nomenclature and characteristics of Restriction enzymes – ligases and DNA modifying enzymes. Plasmid vectors – properties and classification – pBR 322, pUC 18, M13 phage vectors, cosmids (pJB 8), cloning genes using M13 vectors. Genomic library and cDNA library – construction, screening libraries by colony, Plaque hybridization.

Unit II   **(18-hours)**

Methods of gene delivery – *Agrobacterium* and CaMV mediated gene transfer, direct gene transfer using PEG, Electroporation, biolistics, microinjection and liposome mediated. *Agrobacterium* and genetic engineering in plants – Ti plasmid (Octopine and Nopaline) – Disarmed Ti plasmid vectors –Ri plasmid. Incorporation of T-DNA into the nuclear DNA of plant cells – role of virulent genes. PCR and its types

Unit III   **(18-hours)**

Industrially important microorganisms – screening of industrial microorganism- Primary screening, crowded plate technique, enrichment culture technique- secondary screening –

improvement of industrial strains. Production media- Fermentation-submerged fermentation (SM) and Solid state fermentation (SSF). Types of fermentor. Industrial production of penicillin, citric acid, glutamic acid, vitamin B12 and SCP.

Unit IV **(18-hours)**

Micropropagation – somatic hybridization, cybrids, artificial seeds and somaclonal variation. Transgenic plants –Bt cotton, golden rice, Flavr Savr Tomato, agricultural biotechnology – Cultivation and Mass Production Biofertilizers – BGA, Mycorhiza, Bacterial *Rhizobium, Azatobacter*, Bioinsecticides- virus, bacteria and fungus agents.

Unit V **(18-hours)**

Application of rDNA technology,PCR techniques, DNA finger printing – DNA vaccines – plant as edible vaccines- Hybridoma - Hairy root culture, Enzyme immobilization, conservation of germplasm *in vitro* strategies.

Text Books

1. Basic Biotechnology – Rev Fr Dr. S. Ignacimuthu, S.J., 1995. Tata Mc Graw Hill Publishing Company Ltd. New Delhi.
2. Plant Biotechnology – S. Ignacimuthu, 1997. Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi.
3. Elements of Biotechnology – P.K Gupta- Rastogi Publication. Meerut.
4. Biotechnology fundamentals and applications, S.S. Purohit 2003.- Published by Agrobios India.
5. A text Book of Biotechnology , R.C. Duby, 2006- S. Chand & Company Ltd, Ram Nagar, New Delhi.
6. Plant tissue culture, Kalyan Kumar De., 1992- New central book Agency P .Ltd, Calcutta.
7. Introduction to plant Tissue Culture, M.K Razdan., 2002. Oxford & IBH Publishing Co.Ltd. New Delhi.

Reference Books

1. Brown, C.M, 1987. Introduction to biotechnology. Blackwell Scientific Publications, Oxford, London.
2. Brown, C.M, Campbell, I. and Priest, F.G, 1990. Introduction to Biotechnology. Blackwell Scientific publications Oxford, London.
3. Brown, T.A, 1999. Genomes. John Wiley & Sons. Newyork.
4. Chawla, H.S. 2000. Introduction to plant biotechnology. Oxford & IBH Publishing Co. Pvt.Ltd. New Delhi.
5. Dixon, R.A and Gonzales, R.A (Eds.) 1994. Plant Cell Culture- A Practical Approach. Oxford University Press, Newyork.
6. Gamborg, O.L and Phillips, G.C. 1998. Plant Cell, Tissue and Organ culture. Narosa Publishing House, New Delhi.
7. Griffiths et al., 1999. Modern genetic Analysis. W.H. Freeman & Co. Newdork.
8. Gupta, P.K, 1999. Elements of Biotechnology. Rastogi Publications, Meerut.
9. Jefrey, M, Backer et al., 1996. Biotechnology – A Laboratory Course. Academic Press, Newyork.
10. Keshav Trehan, 1991. Biotechnology. Wiley Eastern Ltd, New Delhi.
11. Kumar, H.D. 2000. Modern Concepts of Biotechnology. Vikas Publishing House, Pvt. Ltd. New Delhi.

12. Pamela Peters 1993. Biotechnology – a guide to Genetic Engineering. Wim, C. Brown Publishers, USA.
13. Primrose, S.B, 1989. Modern Biotecnology. Blackwell Scientific Publications, Oxford, London.
14. Thorpe, T.A. 1981. Plant Tissue Culture. Academic Press, London.
15. Trivedi, P.C (Ed.) 2000. Plant Biotechnology – Recent Advances. Panima Publishing Co. New Delhi
16. Patel, A.H. 2001. Industrial microbiology, Mac Millan India Ltd.

CORE 13- Biochemistry

Hours/week: 6   **Subject Code: P1BYC33**

Credit: 4

Objectives

1. It is an interdisciplinary program that focuses on the chemistry of living systems
2. It analyzes the chemical combinations and reactions which take place in biological processes like the process of growth, metabolism, reproduction and heredity
3. .It also delves deep into the structures and functions of enzymes, proteins, carbohydrates, fats, and other numerous processes related to metabolism of the mankind

Unit I   **(18-hours)**

Chemistry of enzymes: classification and nomenclature of enzymes; IUB, isolation and purification of enzymes; concept of active site, mechanism of enzyme action; Michaelis menton equation and Km value. Enzyme modifier-activator, inhibitors, allosteric enzymes; regulation of enzyme action; isozymes-dignostic applications.

UNIT II   **(18-hours)**

Amino acids and proteins: biosynthesis of amino acids; properties and chemical reaction concerned with amino acids; proteins: primary, secondary, tertiary structure of protein, 3 D structure and protein folding, physiochemical properties of proteins.

UNIT III   **(18-hours)**

Metabolism of carbohydrates: chemical reactions and derivatives of monosaccharide; glycolysis-T.C.A. cycle, E.T. chain- ATP synthesis; gluconeogenesis- H.M.P Pathway. Glyconeogenesis

UNIT IV   **(18-hours)**

Metabolism of lipids: oxidation of palmitic acids and its bioenergetics; biosynthesis of any one fatty acid; unsaturation of fatty acids; biosynthesis of cholesterol; importance of cholesterol and plant lipids.glyoxylate metabolism.

UNIT V   **(18-hours)**

Chemistry of vitamins: vitamins as co-enzymes; chemistry and biosynthesis of hormones-thyroxine, catechalamines, steroidal hormones. intermediary metabolism; integration of metabolic pathways.

REFERENCES

1. Jain, J.L. 2000. **Fundamentals of Biochemistry**. S. Chand & Co. New Delhi.
2. Plummer, D.T. 1996. **An Introduction to Practical Biochemistry.** McGraw Hill.

TEXT BOOKS

1. Conn, E.E. and Stump P.K. et al., 1999. **Biochemistry**. John Wiley and Sons. New Delhi.

Core Practical – 14 Microbiology, Fungi, Plant Pathology & Biotechnology

Hours/week: 4   Subject Code: P1BYC3P1

Credit: 3

Microbiology, Fungi, Plant Pathology

Practical syllabus :
1. Sterilization method
2. Preparation of culture Media – Nutrient Agar (NA) and Potato Dextrose Agar (PDA)
3. Isolation of microbes from soil and water using serial dilution technique.
4. Staining of Bacteria – simple and gram staining.
5. Hanging drop technique.
6. Micro preparation and observation of the following fungi:
   Plasmodiophora, *Stemonitis*, *Synchytrium*, *Albugo*, *Mucor*, *Rhizopus*, *Pilobolus*, *Aspergillus, Pencillium, Xylaria, Peziza, Puccinia, Polyporus, Lycoperdon, Agaricus* and *Alternaria*.
7. Observation of infected plant specimens mentioned in the syllabus.

Biotechnology

Practical Syllabus:
1. Isolation of plant chromosomal DNA- CTAB method
2. Quantitative estimation of DNA.
3. Agarose gel electrophoresis and visualization of DNA.
4. Restriction endonuclease
5. Amplification of DNA using PCR - demonstration.
6. Plant tissue culture, suspension culture - Demonstration
7. Demonstration of isolation of plant protoplasts.
8. Demonstration and regeneration from Callus cultures.
9. Diagram of vectors, Southern blot and Western blot.

Microbiology, Fungi, Plant Pathology & Biotechnology

5. Make suitable temporary micro preparations of **A.** Submit the slide for valuation. Identify, draw diagram and give reasons.   8 marks
6. Write the procedure and perform the gram staining technique for the given culture. Submit the slide for valuation.   8 marks
7. Prepare a hanging drop of culture and show the slide for valuation (Need not write the procedure)   5 marks
8. Comment on the etiology of **B**   5 marks
9. Write critical notes on **C, D, E, F, G** & **H**   6 x 4 = 24 marks
10. Submission of Record note books   10 marks

Key and Scheme of Valuation

1. **A**-Fungi
   Slide -2 marks; Identification-1 mark, Diagram -2 marks, Notes-3 marks.
2. Gram staining - procedure - 4 marks, performance – 4 marks
3. Preparation of hanging drop of culture -5marks
4. **B**-Pathology (specimen / photograph)

Causal organism – 1 mark, diagram – 1 mark, symptoms – 2 marks, control measures – 1 mark.
5. **C** – Microbiology, **D** – Fungi, **E, F, G** and **H** – Biotechnology.
Identification – 1 mark, diagram – 1 mark, notes – 2 marks.

Core Practical – 15 Biochemistry

Hours/week: 4   **Subject Code: P1BYC3P2**
Credit: 3

1. Qualitative test for Carbohydrates (reducing sugar, Starch),Protein, amino acid (Tryptophan),Lipid (cholesterol)
2. Quantitative Estimation of Sugar, Starch, Protein and free amino acid by Calorimetric method
3. Quantitative estimation of Lipid by Gravimetric method.
4. Determination of p Ka value for acetic acid
5. Enzyme assay (amylase)
    a. Determination of Km value
    b.Effect of pH on enzyme activity.
    c..Effect of inhibitor on Enzyme activity

BIOCHEMISTRY

1. Major Experiments
    a) Determination of Km Value for the enzyme amylase   **15 Marks**
    b) Factors affecting enzyme activity (Inhibitors or pH)   **10 Marks**

2. Minor Experiments   **15Marks**

3. Determine the chemical nature of the give solution by Qualitative analysis   **9 marks**

4. Spotters "**A**" and '**B**"   **2 X 3 = 6 Marks**

5. Record   **5 Marks**

Key for evaluation
1   a) Procedure 3 marks, Experiment 7marks   Result and interpretation 5 marks
        b) Procedure 2 marks, Experiment 5marks   Result and interpretation 3marks
2   Procedure 3 marks, Experiment 7marks   Result and interpretation 5 marks

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Elective II   BIODIVERSITY AND CONSERVATION

Hours/week: 5   **Subject Code: PIBYE31**
Credit: 5
Objectives
1.To characterize biological traits that lead to a population becoming threatened, rare or invasive.
 2. To develop habitat management strategies that take account of drivers of biodiversity change in order to maintain threatened populations or assist populations to adapt.
3. To suggest priorities for habitat, ecosystem and landscape biodiversity conservation policy on the basis of dynamic ecosystems and the services they provide, including the perfection and maintenance of endangered habitat lists.

Unit-I   **(18-hours)**

Biodiversity: definition, concept, scope; levels of biodiversity :Genetic, species and ecosystem diversity; Magnitude of biodiversity-Global pattern of biodiversity (abiotic and biotic theories); Measures of biodiversity-alpha, beta and gamma diversity- key stone species and their significance in an ecosystem function-concept of Hot Spots distribution of hotspots in India and the world; values of biodiversity: economic, ecological and societal. Island biogeography theory.

Unit-II   **(18-hours)**

Methods of sampling: quadrat method, transect method, plot less method, pitfall method, sweep net method and all out searches. Diversity indices: Dominance indices- Berger and Parker-Simpson; Information- Statistic Indices- Brillouin- Shannon. Community similariy-Jaccard coefficient –Sorenson coefficient.

Unit-III   **(18-hours)**

Threats to Biodiversity –Habitat loss and fragmentation, Introduction of alien invasive specis- Disturbance and pollution- Harvesting and exploitations-GMOs and biodiversity; -Extinction of species- causes for species extinction- IUCN Red list categories. International efforts for conserving biodiversity-CITES, WTO, CBD, International treaty on Plant Genetic Resources.

Unit IV   **(18-hours)**

Conservation-need for conservation-*in situ* conservation –sanctuaries, national parks, biosphere reserves; *ex situ* conservation- Gene banks, seed banks, Pollen banks, and Cryopreservation –Role of indigenous people in conservation sacred species, sacred groves; Biodiversity conservation –human –animal conflicts.

Unit V   **(18-hours)**

Bio prospecting, Indigenous knowledge, Biopiracy, Impact of new technologies; biotechnology and genetic engineering, Intellectual property rights –GATT, WTO-Farmers and breeders right, TRIPS-Biodiversity act-2002

Text Books:
1. Krishnamurthy, K.V. 2003. An advanced Book on Biodiversity-Principles and Practice. Oxford and IBH publishing company, New Delhi.
2. Singh, J.S., Singh, S.P. and Gupta, S.R. 2010. Ecology, Environment and Resource Conservation. Anamaya Publishers, New Delhi.
3. Biodiversity- CPR Environmental Education Center, Chennai

Reference Books:
1. Peter Stiling. 2002. Ecology- Theories and Application. Prentice- Hall of India, New Delhi.
2. Miller, T. 2010. Environmental Science. Cengage Learning India Pvt. LTD, New Delhi

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CORE- 16 - PLANT PHYSIOLOGY

Hours/week: 5   **Subject Code: PIBYC41**
Credit: 4
Objectives

This subject is designed to investigate plant structure and function at the individual plant level and then apply this understanding to plant strategies and adaptations in different environments. By the end of the course, students will be expected to:
a) understand how plant structure relates to function;
b) understand how and why water and ions are transported through plants;
c) understand plant strategies in the capture of light;
d) recognize different methods plants use to sequester nutrients;
e) understand different plant strategies in the utilization of nutrients;
f) understand and give examples of plant adaptations to different environments and disturbances; like climate change scenarios and their impacts on plant physiology;

UNIT I   **(18-hours)**

Water relations – physico chemical properties of water; theories on membrane permeability; diffusion, osmosis and imbibition; plasmolysis and deplasmolysis- significance; water potential – definition, water potential gradient, soil-plant-air-continuum. Absorption of water: types of soil water, water absorbing parts of plants. Mechanism of water absorption, active and passive absorption, significance. Ascent of sap- Transpirational pull theory.

UNIT II   **(18-hours)**

Mineral salt absorption: mechanism of mineral salt absorption theory, passive absorption theory, apoplastic, mass flow theory, Donnan's equilibrium, active absorption theory – symplast, Carrier concept theory, protein lecithin and cytochrome pump hypothesis. Transpiration: types, significance, mechanism of stomatal opening and closing – theory of starch, glycolate,K^+ ions. Antitranspirants and guttation.

UNIT III   **(18-hours)**

Photosynthesis – excitement and ground state, electromagnetic spectrum, photosynthetic apparatus. PSI and PSII reaction centres, components of cyclic and non cyclic reactions. "Z" scheme, Emerson's enhancement and Red drop effect. CO_2 assimilatory pathways, C_3, C_4(three types NADP-ME, NAD-ME & PCK types). CAM pathway – interrelation and differences

UNIT IV   **(18-hours)**

Respiration –RQ – Aerobic, Anaerobic respiration, fermentation types, ETP complexes, cyanide resistant pathway. Photorespiration – Dual action of Rubisco – Glycolate (C_2 pathway) nitrogen metabolism- nitrogen cycle- N_2 fixation –Diazotrophs, symbiotic and enzymes involved in N_2 fixation

UNIT V   **(18-hours)**

Growth curve, bioassay, chemistry and physiological applications of phytohormones: auxin, gibberellins, cytokinins,ABA,ethylene and brassinosteroids. Role of light – photoperiodism – types and significance; vernalization, senescence and ageing mechanism (brief acount). Phytochromes – properties, mechanism of action and functions. Stress physiology – drought, salt, heat and radiation stress – adaptations in plants. Biological clock – circadian rhythm in plants (a brief account).

REFERENCES

1. Devlin and witham, 1997. **Plant Physiology**. CBS Publishers and Distributers, New Delhi.
2. Lincoln Taiz and Eduardo Zeiger, 1991. **Plant Physiology**. The Benjamin/ Cummings publishing Company, Inc.
3. Noggle and Fritz, 1999. **Introductory Plant Physiology**. Prentice hall, London.
4. Salisbury, F.B. and Ross. C. 2000. **Plant Physiology**. John Wiley & Sons, New Delhi.
5. Wilkins, M.B. (Ed) 1984. **Advanced Plant Physiology**. Pitman Publishing Co. New York.

CORE-17 - BIOINFORMATICS AND BIOSTATISTICS

Hours/week: 5   **Subject Code: PIBYC42**
Credit: 4

Course Objectives

1) Provide expertise in study design, including endpoint definition, sample size estimation and power calculation, randomization procedures, data collection from design, plans for report generation, interim reviews, and final analysis.

2) Provide analyses and informatics support for all biological research projects using contemporary statistical and computing methodologies by softwares.

3) The main aim of this core is to incorporate aspects of high-throughput and high-performance computing with knowledge discovery approaches through the application of neural-networks, probability and statistics to support and enhance each of the participating projects and the Molecular Analysis.

Unit-I   **(18-hours)**

Introduction to Bioinformatics: Definition, objectives. Introduction to Triple letter and single letter code for amino acids, Symbols used in nucleotides, Biological data formats. Retrieval and visualization of Sequence (Nucleotide and protein) and structure of protein. Applications of Bioinformatics in various fields.

Unit II   **(18-hours)**

Biological Databases- Primary, secondary and specialized databases. Nucleic acid databases-NCBI, DDBJ, and EMBL: Protein databases-PDB, PIR, and SWISSPROT. Structure elucidation - SCOPE and CATH. Sequence retrieval method from different databases. Sequence analysis- Local vs. Global; multiple sequence alignment; Dynamic programming – Smith Waterman / Needle man wunsch algorithm, Online search tools – BLAST / FASTA.

Unit III   **(18-hours)**

Genome and proteome analysis: genomics - structural, functional and comparative genomics, isolation of genes, Genome sequencing-Maxam Gilbert method, Sanger method. Genome mapping, Genome analysis-Microarray, proteomics-structural and functional proteomics: tools-proteomic analysis-2D PAGE, MS MALDI-TOF.

Unit-IV   **(18-hours)**

Biostatistics: Definition and scope-Descriptive and inferential statistics, Populations, Samples, Variables, Parameters, Collection of data, Sampling methods, organizing the data into summary tables and graphing the data.

Unit-V (18-hours)

Measures of central tendency-arithmetic mean mode and median, measures of dispersion-Mean deviation and standard deviation and standard error. Probability-addition and Multiplication theorems-normal distribution and binomial distribution. ANOVA (one way and two way), correlation and regression-Tests of Significance(t,f)-X^2 test and its applications.

TEXT BOOKS

1. Khan and Khan.1994.**Biostatistics**.Vikas Publising House Pvt.Ltd.New Delhi.
2. Shanmugavel.P.2006.Trends **in Bioinformatics**, Pointer Publishers,Jaipur,India

REFERENCES

1. Daniel WW, 1995.Biostastics.7th edition,John wiley and Sons,Newyork,USA
2. Bliss CI,1970.**Statistics in Biology**.Vol I and II,Mc Graw-Hill Inc.USA
3. Shanmugavel,P.2005.Principles **of Bioinformatics**.Pointer Publishers,Jaipur,India
4. Lehinger,A.L.Principles **of Biochemistry**.CBS Publishers and distributors,New Delhi,India
5. Stryer L.**Biochemistry.**4th Ed.W.H.Freeman and company,Nweyork
6. Attwood T.K. and Parry-Smith .1999.**Introduction to bioinformatics.**A W Longman Ltd.UK.
7. R.M.Twyman.2008.Principles **of Proteomics**.Taylor and francis.UK
8. David W Mount 2005.**Bioinformatics sequence and genome analysis**(2 nd edition) CBS Publishers.Newdelhi
9. Jean Michel Claveria and Cedric Notre dome 2006.**Bioinformatics-A beginners guide** – Wiley Dream tech-Newdelhi
10. Orpita Bosu and Simminder Kaur Thukral 2007. **Bioinformatics Databases, Tool and Algorithms.** Oxford University Press.
11. Mani, K. and Vijayaraj, N. 2004. **Bioinformatics a Practical Approach**. Aparna. Publications, Coimbatore.

CORE-18 - DEVELOPMENTAL BOTANY

Hours/week: 5 **Subject Code: P1BYC43**
Credit: 4
Objectives:
1. To understand the structure and development of male and female reproductive organs of angiosperns
2. To analyze the morphogenetic potentials pertaining to its development of various organs

UNIT I (18-hours)

A brief historical account, Microsporogenesis: Structure and function of anther wall layers, Tapetum and its types and ultrastructure; role of tapetum in pollen development. pollen wall development and structural variability.Pollen fertility and sterility, germination.Pollen-Pistil Interaction, structure and development of Male gametophyte.

UNIT II (18-hours)

Megasporogenesis: Crassinucellate and Tenuinucellate. Structure and development of female gametophyte (Monosporic, bisporic and Tetrasporic), ultrastructure of components of Embryosac- egg, synergids and antipodals. Nutrition of embryosac.

UNIT III   (18-hours)

Endosperm: classification, Structure and development, Ruminate endosperm, mosaic endosperm, endosperm haustoria, physiology and cytology of endosperm, Role of polarity in cell differentiation, Role of sucrose in vascular differentiation, symmetry, Morphogenetic factors- Physical, physiological and genetical, endosperm culture, embryo culture, anther culture, Haploid production.

UNIT IV   (18-hours)

Double Fertilization - germination of pollen, path of pollen tube, Heterospermy, differential behaviour of male gamete, discharge and movement of sperms. Syngamy and triple fusion, Role of synergids- filiform apparatus, Heterofertilization. Sexual Incompatibility-its genetic basis, molecular aspects, physiology and biochemistry, Barriers to fertilization, methods to overcome incompatibility, post-fertilization changes in a flower.

UNIT V   (18-hours)

Structure and development of typical dicot(*Ceratophyllum*) and monocot(*Najas*) embryos- structure and function of suspensor, Apomixis, Polyembryony-causes, classification and applications; Parthenocarpy – types and importance, plant galls- types, structure and development.

TEXT BOOK

- Maheswari, P. An *Introduction* to the *Embryology of Angiosperms*. McGraw Hill, New Delhi.

REFERENCE

- Bhojwani, S.S. and Bhatnagar, S.P. *The Embryology of Angiosperms***.** Vikas Publishing House, New Delhi.
- Shivanna, K.R. and Johri, B.M. *The Angiosperm Pollen structure and Function*, Wiley Eastern Ltd., Publications, 1989.
- Johri, B.M., Ambegaokar, K.B. and Srivastava, P.S. *Comparative Embryology of Angiosperms*, Vol. I & II, Springer Verlag.
- Kalyan Kumar De 1997 *An Introduction to Plant Tissue Culture*, New Central Book Agency, Calcutta.
- E.W.Sinnott 1960 *Plant Morphogenesis* McGraw-Hill, New York.

LAB-VII   PLANT PHYSIOLOGY

Hours/week: 4   **Subject Code: PIBYC4P1**
Credit: 3

1. Determination of Osmotic potential of Rhoeo cell sap by plasmolytic method
2. Determination of Water Potential of Potato tuber by Gravimetric method
3. Determination of Water Potential of Potato tuber by falling drop method
4. Effect of Detergent on membrane permeability.
5. Effect of Organic solvent (acetone) on membrane permeability
6. Effect of temperature on Membrane permeability
7. Determination of Anthocyanin
8. Determination of Stomatal Frequency and stomatal Index.
9. Effect of Leaf age on chlorophyll content

10. Effect of shade and direct sunlight on chlorophyll content.
11. Effect of Cytokinin on the delay of senescence in terms of chlorophyll content
12. Determination of proline from normal and water stressed plant

Plant Physiology

1.	Major Experiments	20 Marks
2.	Minor Experiments	15 Marks
3.	Interpretation of DATA	6 Marks
	(Conversation of table to graph or graph to table)	
4.	Experimental setup	6 Marks
5.	Spotters "A" and "B"	2 X 4 Marks =8 marks
6.	Record	5Marks

Key for evaluation

1) Procedure 5 marks, Experiment 10marks   Result and interpretation 5 marks

2) Procedure 3 marks, Experiment 7marks   Result and interpretation 5marks

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CORE-20 - BIOINFORMATICS AND BIOSTATISTICS

Hours/week: 5   **Subject Code: PIBYC4P2**
Credit: 3

Practicals

1. Computation of mean, median, mode, standard deviation. Frequency distribution, Histogram, frequency polygon, frequency curves and cumulative frequency curves, Graphic location of median and mode
2. Bar and pie Diagrams
3. Pearson co-efficient of correlation and Spearman rank correlation
4. Regression equations of X or Y on X estimation of X and Y values
5. Problems connected with probability rules
6. X^2 test problems-a) Test of Good ness of fit b) Test of independence
7. Calculation of probability using Binomial and normal distribution
8. t-test for significance of mean of a random sample b) testing significance between means of two samples (independent and period samples)
9. Biological Databanks-Sequence databases, structure databases, specialized databases; Data retrieval tools and methods; Database file formats
10. Molecular visualization –Rasmol, Cn3D, Swiss PDB viewer.
11. Database similarity searching and dynamic programming algorithms
    -Sequence similarity searching-NCBI BLAST, FASTA
    - Pair wise and Multiple sequence alignment –Clustal W
12. Analysis of protein and nucleic acid sequences- Dot matrix, Substitution matrix
13. Protein sequence analysis-ExPASY proteomic tools.

DEVELOPMENTAL BOTANY – Practical Syllabus

1. Study of microsporogenesis in sections of anthers.
2. Examination of pollen morphology
3. *In vitro* pollen germination in different concentration of sucrose solution
4. Identification of different types of embryos, endosperm types, types of pollen grains, anther growth stages and types using permanent slides
5. Study of ultra structure of female gametophyte with the help of slides and microphotographs.
6. Examination of haustorial endosperm (Cucurbitaceae) through dissections and staining.
7. Dissection and study of various stages of embryo development (*Tridax*)
8. Study the anatomy of ovary/ flower/ fruit wall / seed coat/ galled leaf, petiole, flower etc.
9. Training in paraffin wax method for preparation of serial sections from fixation to mounting of permanent slides.

LAB-VIII   BIOSTATISTICS AND BIOINFORMATICS AND DEVELOPMENTAL BOTANY

1. Work out the Problems given in "**A** "and "**B**"   (2 X 7 =14 Marks)
2. Represent the given data in "**C**" in a Pie-Diagram or in a Bar Diagram   (5 Marks)
   (as allotted by the examiner)
3. Dissect out the embryo/Endosperm haustorium of "**D**" and leave the slide for valuation (5 marks)
4. Make temporary micro preparation of "**E**", draw diagrams and write notes. Submit the slide for valuation. (4 marks)
5. Take microtome sections of "**F**" at 12micron thickness and submit the slide for valuation (5 marks)
6. Write critical notes on **G, H , I and J**   (4 X 3=12Marks)
7. Submission 5 permanent slides   (5 marks)
8. Submission of record note books   (10marks)

Key & Scheme of Valuation

1. Any simple problems from Chi-square "**A**"- Tabulation- 2; Calculation – 2 marks and Result and Inference- 3marks
 "**B**" Measures of central tendency Mean – 2 marks; Median – 2marks; Mode – 2marks and Standard deviation – 1 marks (*Polyalthia*)
2. Value as a whole "**C**"   5Marks
3. Submission of slide "**D**" – 5 marks Embryo (*Tridax*), Endosperm (Cucurbitaceae)
4. "**E**" Submission of slide -2Marks, Comment-2Marks (Any ovary, fruit wall, seed coat, plant galls)
5. "**F**" Demonstration -2 ; submission of slides -3Marks
6. Identification- 1mark, Comment-2 Marks (Spotters   from   **G & H** Bioinformatics, **I, & J** Developmental Botany)

PROJECT WORK   **SEMESTER-IV**

Credit-5   **Sub code-PIBY4PV**

Hours/week-6

Objectives:

The aim of project work (field/ lab work) is to inculcate students to learn adequate knowledge on research methodology in the subject and prepare them for pursuing research in experimental or computational areas of the subject. Students allotment by lot system. The project work or Field Study is to be undertaken under the guidance of a Teacher of the Department. The guiding teacher will make continuous internal assessment of the Project Work/ Field Study. No teacher shall be permitted to guide more than ***three*** students in a semester for Project Work/Field Study under his/her supervision. The project work will be evaluated by the external examiner.

- Project will be done by the final year students in the fourth semester under the guidance of respective guides.

- For projects internal marks (max 40) will be awarded by the respective guide and external marks (max 60) will be awarded in the external examinations.

- Minimum number of Pages for M.Sc. Project thesis should be 40

Course Name : Bachelor of Science

Discipline   : Zoology

COURSE SCHEME:

Semester	Part	Subject	Credit	Hours	Int+Ext=Total	Subject code	Revision
III	Part – I	Tamil/Hindi	3	6	25+75=100	U1PT31/ U1PH31	Revised
	Part – II	English	3	6	25+75=100	U1PE31	Revised
	Core – 4	Developmental Biology	4	4	25+75=100	U1ZYC31	Revised
	Core Lab	LAB:Developmental Biology	-	2		---	Revised
	Allied I – 3	Chemistry	4	4	25+75=100	U1CHA3X3	Revised
	Allied I – 3 Lab	Chemistry Practical	-	2		---	-
	Allied II – 1	Sericulture Paper – 1	4	4	25+75=100	U1ZYA31	New
	Allied II – 1 Lab	Sericulture Practical	-	2		---	-
IV	Part – I	Tamil/Hindi	3	6	25+75=100	U1PT41/ U1PH41	Revised
	Part – II	English	3	6	25+75=100	U1PE41	Revised
	Core – 5	Cell Biology	4	4	25+75=100	U1ZYC41	Revised
	Core Lab – 6	Developmental Biology & Cell Biology	2	2	40+60=100	U1ZYC4P1	Revised
	Allied I – 4	Chemistry	4	4	25+75=100	U1CHA4X4	Revised
	Allied I – 4 Lab	Chemistry Practical	2	2	40+60=100	U1CHA4PX	No change
	Allied II – 2	Sericulture Paper – II	4	4	25+75=100	U1ZYA41	New
	Allied II – 2 Lab	Sericulture Practical	2	2	40+60=100	U1ZYA4P1	New
Year I & II	Part – V	NSS / NCC /Physical Education-Sports	1	-	Int=100	U1NS1/ U1NC1/ U1PS1	

SYLLABUS FOR EACH PAPER:

SEMESTER – III

DEVELOPMENTAL BIOLOGY

CORE: 4   CREDITS: 4   Subject Code: U1ZYC31

Contact hours per Week – 4 hours

Contact hours per Semester – 60 hours

Objectives
- To introduce the students to a comprehensive account of the important concepts in developmental biology
- To know the mechanisms involved in the process of gamete formation

UNIT – I   **(6 Hours)**
Historical concepts of Embryology
1. Scope of Embryology
2. History of Embryology- Preformation theory, Epigenesis law, Baers law, Biogenetic law, and Germ plasm theory
3. Stages of Development: Egg, Zygote, Cleavage, Blastulation, Gastrulation and Organaogenesis

UNIT –II   **(18 Hours)**
Gametogenesis
1. Human male reproductive organ - Anatomical feature
2. Spermatogenesis
3. Types of vertebrate sperms
4. Structure of Human sperm
5. Human female reproductive organ- Anatomical features
6. Oogenesis
7. Classification of eggs
8. Structure of Egg – Amphioxus, Frog and Human
9. Fertilization – Definition and types of fertilization
10. Process – Chemotaxis, Fertilizin, Antifertilizin, Acrosomal, Cortical, Amphimixis, Physiological and Biochemical changes, Significance of fertilization
11. Parthenogenesis

UNIT – III   **(12 Hours)**
Cleavage, Blastulation and Gastrulation
1. Cleavage – Definition, Planes, patterns of cleavage, significance, factors controlling cleavage and Laws of cleavage
2. Blastuation – types of blastula and blastulation in frog egg
3. Gastrulation – Morphogenetic movements, gastrulation in frog egg and fate map of frog egg
4. Development of organs from three embryonic germinal layers

UNIT –IV   **(15 Hours)**
Organogenesis
1. Development of Brain in frog
2. Development of Heart in frog
3. Organiser concept and process of Induction
4. Gradients – Child Hypothesis, Double gradient theory, Biochemical gradients in Sea urchin eggs – Factors affecting gradients
5. Regeneration – Definition, Types, Regeneration of Salamander limbs, Factors affecting regeneration

UNIT – V   **(9 Hours)**
General Topics
1. Placentation in Mammals
2. Amphibian metamorphosis
3. Human Reproduction – Puberty, Menstrual cycle, Menopause, Pregnancy,

....

   Parturition and lactation
4. Birth Control – Definition, and its advantages, Contraceptive devices
5. Twins – Identical twins and Siamese twins
6. Nucleocytoplasmic interaction

Text books
1. Chordate Embryology. Verma.S and Agarwal,V,K S. Chand & Co New Delhi
2. Text Book of Embryology- N.A Arumugam, Saras Publication

Reference Books
1. An Introduction to Embryology, Balinsky, B.1. WB. Saunders Co Philadelphia
2. Developmental Biology, N.J.Berrrill,McDraw Hill New Delhi

SEMESTER: IV
CELL BIOLOGY

CORE: 4   **CREDITS: 4**   **Subject Code: U1ZYC41**
Contact hours per Week – 4 hours
Contact hours per Semester – 60 hours

Objectives
  ➢ To understand the cytological techniques
  ➢ To study the ultrastrucure of cellular organelles and their importance in cell physiology

UNIT – I   **(12 Hours)**
Microscopy
1. History of Light microscope - Jenssons, Hooks, Leuwenhock, and Wilson Barrel contribution in the discovery of microscope
2. Resolving power
3. Compound Microscope - Structure and Magnification. Light pathways in the microscope
4. Electron Microscope - Structure and Magnification
5. Phase contrast microscope and Florescence Microscopy

UNIT – II   **(12 Hours)**
Cytological Techniques

1. Histochemical preparation – Killing and Fixation of tissues – chemical fixation – fixation by freezing – Freezing drying – freezing substitution – freezing etching methods, Dehydration – Embedding and sectioning
2. Cytochemical Staining – Stains, Classification of stains, Mordant and lake, Mounting
3. Comparison of histochemical slide preparation between compound and electron microscope
4. Centrifugation- Sedimentation co-efficient, Centrifugation types – Ordinary, High speed, Differential centrifugation and Density gradient centrifugation

UNIT -III   **(15 Hours)**
Cell and its organelles
1. Ultrastructure of a typical animal cell - Protoplasm – Physical nature – Reticular, alveolar, granular, Fibrillar and colloidal theories
   Chemical organization of protoplasm – elements, water, organic and inorganic components
   Biological properties of protoplasm

2. Plasma membrane – Chemical composition, Fluid mosaic model, and functions
3. Endoplasmic reticulum – Ultrastructure, types and functions
4. Golgi complex – Ultrastructure, Morphology, Functions-secretion, membrane formation, protein process
5. Mitochondria – Ultrastructure, Mitochondrial enzymes, and Functions
6. Ribosomes and Lysosomes.

UNIT – IV   **(15 Hours)**
Nucleus & Chromosomes
1. Ultrastructure of Nucleus, cytochemistry, Nuclear membrane and Karyolymph.
2. Nucleolus – cytochemistry, fine structure, nucleolar cycle, nucleoplasm, and functions
3. Chromosomes – Typical structure, types of chromosomes, Giant chromosomes – Polytene and Lampbrush
4. Folded chromosome of E.coli
5. Cell cycle, Mitosis and Meiosis cell division

UNIT – V   **(6 Hours)**
Cancer Biology & Aging
1. Cancer- Characteristics, Types, theories of cancer formation - Mutation, Virus, Metabolic, Hormonal disturbance, and irritation theory. Diagnosis and treatment.
2. Cell to Cell Interaction- Cell adhesion and Intercellular communication
3. Aging- Causes, Subcellular changes during aging, programmed cell death

Text Book
1. Cytology- P.S. Verma & V.K. Agarwal, S.Chand & Co, New Delhi.
2. Cell Biology- S.Arumugam, Sara Publications

Reference
1. Cell Biology - De Robertis, E.D.Nowinski WB Saunders Co,Philadelphia
2. Cell Biology - Ambrose.E.J. and Dorothy, M.E Camlett press, Great Britain

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SEMESTER: IV
LAB:DEVELOPMENTAL BIOLOGY AND CELL BIOLOGY PRACTICAL
(To be done at the end of the Fourth Semester)
CORE LAB: 2   **CREDITS: 2**   **Subject Code: U1ZYC4P1**
Contact hours per week – 2 hours
Contact hours per semester – 30 hours
DEVELOPMENTAL BIOLOGY
1. Spermatogenesis – Cross section of vertebrate testes (Slide), Spermatogenesis Process Flow chart – Diagram
2. Types of Sperms - Human sperm smear (Slide) Enlarged Human Sperm (Diagram)
3. Oogenesis - Cross section of a mammalian Ovary
   Oogenesis process flow chart
4. Frog embryology - Cleavage
   Vertical section of Blastula
   Vertical section of Gastrula
   Neurula (Diagram)
5. Chick embryology - Identification of age - 24 Hours, 48 Hours, 72 Hours and 96 Hours

Development of Brain - Chick-Transverse section through Head
Development of Heart - Chick- Transverse section through thoracic region
Placenta - Cotyledonary and Discoidal placenta

LAB IN CELL BIOLOGY

1. Microscopy - Dissection microscope, Compound Microscope
2. Focusing a slide specimen using Compound Microscope
3. Mounting of Squamous epithelial cell
4. Identification of different epithelial cells
5. Chironomus larva - Mounting of Salivary gland Chromosomes (Demonstration)
6. Onion - Squash preparation of root tip to study Mitosis
7. Meiosis stages-slides
8. Cell organelles diagrams - Endoplasmic reticulum, Ribosomes, Mitochondria, Golgi complex and Nucleus

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SEMESTER: III
MULBERRY CULTIVATION AND FARM MANAGEMENT

ALLIED II: 1   **CREDITS: 4**   **Subject Code: U1ZYA31**
Contact hours per Week – 4 hours
Contact hours per Semester – 60 hours

Objectives
➢ To familiarize the students with the Taxonomy and Morphology of mulberry plant
➢ To understand the methods of cultivation of mulberry for economic rearing of silkworm

UNIT   I
(12 Hours)
Taxonomy distribution and Morphology of Mulberry
          Taxonomy of mulberry – Classification and varieties of mulberry-Distribution of mulberry plant – Leaf, Stem, Root, Flower and Fruit

UNIT   II
(12 Hours)
Propagation of Mulberry
          Seedling and vegetative propagation – Cutting, Grafting and Layering-Nurseries.

UNIT   III
(12 Hours)
Cultivation of Mulberry
          Climate- rainfall- soils- preparation of land, planting distance-selection of planting material- planting methods- Inter cultivation – mulching – Irrigation- Manures and Fertilizers – micronutrients- pruning – types of pruning – weeding.

UNIT   IV
(12 Hours)
Harvesting of Mulberry leaves

Methods of estimation of leaf yield – Leaf harvesting methods – Storage and preservation of harvested leaves - Nutritional composition of mulberry leaves - Economics of rain fed and irrigated farming.

UNIT – V
(12 Hours)
Diseases and pests of mulberry

Bacterial, viral, fungal and parasitic diseases – pests of mulberry - Lepidopteron pests, Jassids, Thrips, Mites and Beetles – Control measures

Text book
1. G.Ganga and J. Sulochana chetty, An Introduction to Sericulture., Second edition, OXFORD & IBH PUBLISHING Co PVT.LTD , New Delhi

Reference book
1. Dr. G. Rangaswami, Sericulture manual 1 – Mulberry cultivation, Food & Agriculture Organisation of the United Nations Rome 1976.

SEMESTER: IV
SILKWORM MORPHOLOGY AND SEED TECHNOLOGY
ALLIED II: 2   **CREDITS: 4**   **Subject Code: U1ZYA41**
Contact hours per Week – 4 hours
Contact hours per Semester – 60 hours

Objectives
➢ To give the students a broad understanding of about the life cycle of silkworm
➢ To provide a concise account of silkworm seed production

UNIT – I
(12 Hours)
Taxonomy, distribution and morphology of silkworm

Mulberry and Non-mulberry silkworms – Taxonomy, Classification and distribution- Life history- Morphology of Bombyx mori – Egg, Larva, Pupa , Adult.

UNIT – II
(12 Hours)
Anatomy of mulberry silkworms

Digestive system, excretory system, Circulatory system, Nervous system, Respiratory system, Reproductive system and Silk gland.

UNIT – III
(12 Hours)
Breeding of silkworm

Grainage - Reproduction in silkworm – Gametogenesis, Spermatogenesis, Oogenesis, Fertilization and Embryonic development – voltinism- Breeding, Hybrid, Silkworm races – Advantages – Types of mating.

UNIT – IV
(12 Hours)
Grainage operation

Stock maintenance - Selection of seed cocoons, protection – Moth emergence, copulation- Sex separation – Decoupling – Moth examination.

UNIT – V
(12 Hours)

Egg production

Oviposition – Sterilisation of the eggs – preservation and protection – Egg cards and loose egg – Artificial hatching – Acid treatment – Hot acid and cold acid treatment – Incubation of eggs.

Text book

1. G. Ganga & J.Sulochana chetty, An Introduction to Sericulture., Second edition, OXFORD & IBH PUBLISHING Co PVT. LTD, New Delhi.

Reference books

1. Dr. Berra Saratchandra , Principles & Techniques of Silkworm seed production, Discovery Publishing house, New Delhi.
2. Dr. S. Krishnaswami, Sericulture manual 2 – Silkworm rearing. Food & Agriculture organisation of the United Nations Rome 1970.

SEMESTER: IV
MULBERRY CULTIVATION AND FARM MANAGEMENT & SILKWORM MORPHOLOGY AND SEED TECHNOLOGY PRACTICAL
(To be done at the end of the Fourth Semester)
ALLIED II LAB: 1   CREDITS: 2   Subject Code: U1ZYA4P1
Contact hours per week – 2 hours
Contact hours per semester – 30 hours

MULBERRY CULTIVATION AND FARM MANAGEMENT

1. Morphology of mulberry plant
2. Propagation of mulberry – Asexual – cutting, Grafting and layering – Sexual – seedling
3. Soil sampling and types of soils
4. Selection and preparation of land
5. Methods of planting – Row system and Pit system
6. Methods of pruning
7. Weeding and Inter-cultivation
8. Methods of irrigation and application of manures and fertilizers
9. Harvesting and storage methods
10. Estimation of yield of mulberry leaves
11. Diseases and Pests of mulberry

SILKWORM MORPHOLOGY AND SEED TECHNOLOGY

1. Morphology of egg, larva, pupa and adult of *Bombyx mori*
2. Life cycle of mulberry silkworm
3. Life cycle of *Muga* silkworm
4. Life cycle of *Eri* silkworm
5. Life cycle of *Tasar* silkworm
6. Mounting of silk gland
7. Digestive system of silkworm larva
8. Identification of sex in silkworm
9. Mating and oviposition

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10. Egg preparation – Egg cards and loose eggs
11. Moth examination
12. Grainage centre

SEMESTER: III
INVERTEBRATA

ALLIED I: 1   **CREDITS: 4**   **Subject Code: U1ZYA3X1**
Contact hours per Week – 4 hours
Contact hours per Semester – 60 hours

Objectives
- ➢ To learn the diversity of organisms in a systematic manner
- ➢ To understand the form and functions of non-chordate animals

UNIT – **I**
(12 hours)
Taxonomy
1. Definition
2. principles of classification
3. Binomial nomenclature

UNIT – **II**
(12 hours)
Protozoa & Porifera
Protozoa:
1. *Paramecium* ––General organization, and Conjugation only
2. Protozoan diseases and their control (Plasmodium Life cycle in detail)
Porifera:
1. *Olynthus* – General organization, Reproduction and Development only.
2. Economic importance of sponges

UNIT – **III**
(12 hours)
Coelenterata & Helminthes
Coelenterata:
1. *Obelia* – Structure of Obelia colony, Medusa and Nematocyst.
2. Coral reefs **--**   formation and its types
Helminthes:
1. *Taenia solium* (Tape worm) – External characters, Digestive system, Excretory system, Reproductive system and Development (Life cycle).
2. Structure, Pathology and control measures of Ascaris .

UNIT – **IV**
(12 hours)
Annelida & Arthropoda
Annelida:
1. Earthworm – External morphology, Setae, Nephridia, Nervous system and Reproductive system only
2. Metamerism in Annelids

Arthropoda:

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1. Penaeus (Marine Prawn) –   External morphology, Appendages, Respiratory system, Reproductive system and Development.
2. Crustacean larvae and their significance

UNIT – V

(12 hours)

Mollusca & Echinodermata

Mollusca:
1. *Pila globosa* – External morphology, digestive system, Respiratory system,
2. Torsion in gastropods

Echinodermata:
1. Star fish – External morphology, Pedicellaria, Water vascular system only.
2. Larval forms in Echinodermata.

Reference books
1. Invertebrate zoology – T.C.Majupuria, (2001) PJradeep Publications. Jalandar.
2. A Manual of zoology – M. Ekambaranatha Iyer and T.N. Ananthakrishna. (2003 Reprint) S. Viswanathan publishers – Chennai.
3. Invertebrate Zoology – E. L. Jordon and P.S. Verma   (2005 Reprint) S. Chand and Company, 7361, Ram nagar, New Delhi – 110 055; ISBN 81-219-0367- X .
4. Invertebrare Zoology – R. L. Kotpal, (2005 Reprint) Third Edition published   by Rakesh Rastogi for rastogi publications, Meerat.
5. Invertebrate Zoology – P.S. Dhami and J.K. Dhami (2003) R. Chand and Company, New Delhi.

Text book
1. A text book of Invertebrata --   N. Arumugam et al., (2008) Saras publications, Kottar, Nagercoil.

SEMESTER: IV

CHORDATA

ALLIED I: 2   **CREDITS: 4**   **Subject Code: U1ZYA4X2**

Contact hours per Week – 4 hours

Contact hours per Semester – 60 hours

Objectives
➢ To study the structure and organization of vertebrates
➢ To understand the functional morphology and comparative anatomy of chordates

UNIT – I

(12 hours)

Phylum Chordata and Prochordates
1. General characters of Chordata and its outline classification upto class level
2. General characters of Prochordates and its outline classification
3. Amphioxus- External features, Modes of feeding, Digestive system, excretory system, Nervous system, and reproductive system
4. Affinities of Prochordates

UNIT – II

(12 hours)

Pisces and Amphibia
1. Shark :- External features , Digestive and reproductive system
2. Accessory respiratory organs in fishes
3. Parental care in amphibian

UNIT – III
(12 hours)
Reptilia
1. General Characters of Reptiles
2. Poisonous and Non-poisonous snakes – Identification, bitting Mechanism and First aid

UNIT – IV
(12 hours)
Aves
1. General characters of class Aves
2. Flightless Birds and their distribution
3. Migration in birds
4. Flight adaptation in birds

Unit – V
(12 hours)
Mammalia
1. Rabbit – External morphology, Nervous system, and Reproductive System only.
2. Dentition in mammals
3. Adaptation of aquatics mammals

Text Books
1. Ekambaranatha Ayya, M., & Ananthakrishana, T.N. – A manual of Zoology – (2005 Reprint) Volume II, Chordata; S. Visvanathan (Printers and Publishers) Pvt Ltd. Chennai.
2. Kotpal, R.L – Vertebrata, (2005 Reprint) Third Edition, published   by Rakesh kumar rastogi for Rastogi Publlishers, Ganapathi Shivaji road, Meerut- 250 002.

References
1. Alexander, R. MCN (1981) The   chordates –II International Edition- Cambridge University press, New Delhi.
2. Kent. C. George. – Comparative anatomy of Vertebrates. Mosby International Edition. Toppan printing, Japan, Library of Congress Catalogue, Card No: 65-15973.
3. Romer, R.S & Parson,T.S. (1986)- the Vertebrate Body, VII Edition, W.B.Saunders, Philadelphia.
4. E.L.Jordon and P.S.Verma – Chordate Zoology (2006 Reprint) published   by S.Chand and Co. 7361, Ram nagar, New Delhi – 110 055. ISBN: 81—219 – 1839 -9.
5. P.S.Dhami and J.K. Dhami., Chordate Zoology (2006 Reprint) – R.Chand and company. New Delhi.

SEMESTER: IV
LAB IN INVERTEBRATA AND CHORDATA

(To be done at the end of the II semester)

ALLIED I LAB: 1   **CREDITS: 2**   **Subject Code: U1ZYA4PX**

Contact hours per week	2 hours.
Contact hours per semester	30hours

DISSECTION
  DEMO

Earthworm: Nerve ring and nerve cord, Body Setae mounting

CHARTS

Honey Bee: Mounting of mouth parts and sting of honey bee

SPOTTERS

Invertebrates

Protozoa: Amoeba, Paramaceium, Euglena and palsmodium.
Coelenterata: Obelia colony, Obelia medusa, Jelly fish, Sea anemone.
Helminthes: Tape worm, Liver fluke, Redia and cercaris,
Nematodes: Ascaris and Wuchereria
Annelida: Earthworm, Nereis, Leech
Arthropoda: Prawn, Zoea larva, Mysis larva, Centipede.
Mollusca: Pila, Pearl oyester
Echinodermata: Star fish oral and aboral view

Chordates

Prochordata: Amphioxus, Balanoglossus, Asidian.
Pisces: Narcine, Echeneis, Hippocampus, Eel, Catla, Tilapia.
Amphibian: bufo, Rhacophorus, Ichthiophis, Salamander.
Reptilia: Cobra, Krait and viper, Dryophis and Ptyas.
Aves: Pectoral and Pelvic girdle of Pigeon, Archaeopteryx.
Mammals: Bat, Loris.

VIRUDHUNAGAR HINDU NADARS' SENTHIKUMARA NADAR COLLEGE

(An Autonomous Institution Affiliated to Madurai Kamaraj University)
[Re-accredited with 'A' Grade by NAAC]
Virudhunagar – 626 001.

Course Name : Master of Science
Discipline   : Zoology

Semester	Part	Subject	Credit	Hours	Int+Ext=Total	Subject code	Revision
III	Core – 11	Immunology	4	6	25+75=100	P1ZYC31	Revised
	Core – 12	Microbiology	4	6	25+75=100	P1ZYC32	Revised
	Core – 13	Evolution	4	6	25+75=100	P1ZYC33	Revised
	Elective – 2	Sericulture	4	6	25+75=100	P1ZYE31	Revised
	Core – 14	Lab: Immunology	3	3	40+60=100	P1ZYC3P1	Revised
	Core – 15	Lab: Microbiology	3	3	40+60=100	P1ZYC3P2	Revised
IV	Core – 16	Developmental Biology	4	6	25+75=100	P1ZYC41	Revised
	Core – 17	Animal Physiology	4	6	25+75=100	P1ZYC42	Revised
	Core – 18	Biotechnology	4	6	25+75=100	P1ZYC43	Revised
	Elective – 3	Aquaculture	4	6	25+75=100	P1ZYE41	Revised
	Core – 19	Lab: Developmental Biology	3	3	40+60=100	P1ZYC4P1	Revised
	Core – 20	Lab:Animal Physiology	3	3	40+60=100	P1ZYC4P2	Revised

SEMESTER: III
IMMUNOLOGY

CORE: 11   **CREDITS: 4**   **Subject Code: P1ZYC31**
Contact hours per Week – 6 hours
Contact hours per Semester – 90 hours

Objectives
➢ To give an overall knowledge of immune systems
➢ To familiarize the mechanisms involved in immune response
➢ To understand the infectious process of human diseases

UNIT – I   (15 Hours)
Basic concepts of Immunology
        Historical perspectives, Lymphoid lineage –T, B cells and its types, Null cells, Myeloid lineage – Neutrophil, Eosinophil, Basophil, Mast cell, mononuclear cell, Dendritic cell.
        Primary Lymphoid organs- Bone marrow, Bursa Fabricius, Thymus
        Secondary lymphoid organs - Spleen, Lymph node, MALT, GALT,
        Innate immunity
UNIT-II   (20 Hours)
Humoral Immune Response
        Primary and Secondary Immune response
        B cell generation, activation & differentiation, Expression of Immunoglobulin

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gene, Structure, Biological Properties and functions of IgG, M, A, D and E

Complement – Classical & Alternate pathways, Complement Fixation Test

Antigen – Antibody Interaction – Affinity, Avidity, Cross reactivity, Precipitation, Agglutination, Radioimmuno assay, ELISA, Western Blotting and Flow Cytometry

UNIT –III (20 Hours)

Cell Mediated Immune Response

T cell generation, activation & Differentiation

Expression of TCR genes – MHC Polymorphism – Antigen processing and presentation (Cytosolic and Endocytic pathways)

Cytokines - Structure and Functions

UNIT – IV (15 Hours)

Transplantation & Tumour Immunology

Transplantation – Graft rejection – mechanism, immune suppressive therapy – General and specific

Oncogenes and cancer induction, tumour antigen, immune response to tumour, tumour evasion of immune system, cancer immunotherapy

UNIT – V (20 Hours)

Human diseases, Immunity and Vaccines

Immune evasion by pathogens

Immunodeficiency diseases – AIDS, SCID, Bruton's disease, Digeorge syndrome, Chediak-Higashi syndrome

Hypersensitivity reactions - Asthma, Haemolytic disease of New born, Serum sickness, Contact dermatitis – Mechanism of reactions

Autoimmunity – Myasthenia gravis, Rheumatoid arthritis, Multiple sclerosis, Hashimoto's thyroiditis

Vaccine - Whole organism vaccines, Purified macromolecular vaccines, Recombinant vector vaccines, DNA vaccines, Synthetic peptide vaccines, multivalent and Subunit vaccines

Production of Monoclonal antibodies

Immunization schedule

Text Book:

1.**Kuby**- Immunology, 4 th edition, Goldsby R.A., Kindt T.J, Osborne B. A 2000 W.H. Freeman and Company.

Reference Books

1. **Ivan Roitt** - Essential Immunology, 9th edition 1994, Roitt I.M., Blackwell Science

2. **Eli Benjamini**, 1996 – Text Book on Immunology – A short course, 3rd edition.

3. **A.K. Chakravarthy**, - Immunology ,2000 Tata McGraw Hill

4. **James.T. Barrett**- Text Book of Immunology, 5th edition, IE International Edition

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SEMESTER: III

MICROBIOLOGY

CORE: 12 **CREDITS: 4** **Subject Code: P1ZYC32**

Contact hours per Week – 6 hours

Contact hours per Semester – 90 hours

Objectives:

- ➤ To learn the structure and physiology of microbes
- ➤ To understand the role of microorganisms in human environment
- ➤ To demonstrate the applied aspects of microbiology in food industry
- ➤ To study the impact of microorganisms in the health of human beings

Unit 1   **(18 Hours)**

Microbial cell structure and function

Differences between prokaryotes and eukaryotes

General characters and classification of bacteria

Structural features of virus, fungi, algae and protozoa

Ultra structure of bacterial cell

Sub cellular structures: cell envelope, Slime layer, Capsules, Cell wall, Pili, Flagella, Cell inclusions, Endospores, Liposomes, nucleoid

Growth of microorganisms: Nutrition – Nutrient media – Culture methods – Methods of measurement of growth – Growth curve – Factors influencing the growth of microorganisms

Unit II   **(18 Hours)**

Microbial Metabolism

Carbohydrate metabolism: EMP, HMP and ED pathway – Kreb"s Cycle – Glyoxylate cycle

Aerobic respiration: Substrate level and Oxidative phosphorylation – ATP generation

Anaerobic respiration: Sulphur compounds – Nitrate and Carbon dioxide as electron acceptors – Fermentation – Electron transport under anaerobic conditions

Photosynthesis in bacteria

Protein metabolism: Biosynthesis of purine and pyrimidine

Lipid catabolism: Beta oxidation

Unit III   **(18 Hours)**

Microbiology Ecology

Microbiology of Air: Sources of microorganisms in air

Microbiology of Water: Sewage treatment - primary, secondary & tertiary.

Microbiology of Soil: microbes involved in nutrient cycling - Carbon, Phosphorus, Sulfur and Nitrogen cycles

Bioremediation: Definition, In-situ and Ex-situ methods

Types – Phytoremediation – Bioleaching of copper and uranium

Biodegradation of oil spill

Unit IV   **(18 Hours)**

Food Microbiology

Fermented foods: Fermented milk, Beer and Vinegar

Food spoilage: Spoilage of milk and milk products, meat and meat products, Plant products by microorganisms

Food preservation: Pasteurization, Appertization, Low and High temperatures, Filtration, Chemicals and Irradiations

Methods of Microbiological examination of foods

Food borne Illness: Bacterial agents - Salmonella and Shigella, fungal agents – Aspergillus and Fusarium and viral agents – Polio and Hepatitis A & B.

Unit V   **(18 Hours)**

Medical Microbiology

Biology, infective processes and control of following diseases: Tuberculosis (Air Borne), Typhoid (water borne) Yellow Fever (Insect borne), Gonorrhea and Syphilis (Sexually transmitted diseases), Genitourinary disease (Mycoplasmal disease), Fungal diseases (Dermatophytoses and Candidiasis) – Toxoplasmosis (Protozoan disease) – Hepatitis B (Viral disease)

Text Books

1. General Microbiology, 7th Edition, Hans G. Schlegel, 1995, Cambridge University Press
2. Text Book of Microbiology, 5th Edition, Ananthanarayanan, Jayaram Paniker, 1997, Orient Longman

Reference Books

1. Food Microbiology, 4th Edition, Frazier W.C., Westhoff D.C., 1995, Tata McGraw Hill Pvt. Ltd.
2. Food Microbiology, 1995. Adams and Moss, New Age International Publishers, New Delhi.
3. Industrial Microbiology, Casida L.E., 1993, Wiley Eastern Ltd.
4. Microbiology, 5th Edition, Pelczar M.J., Chan E.C.S., Kreig N.R., 1998, Tata McGraw Hill Pub. Co. Ltd.
5. Microbiology, 4th Edition, Prescott, Harley, Klein, 1999, WCB McGraw Hill Co.
6. General Microbiology, 3rd Edition, Stainer R.Y., Doudoroff M, Addberg E.A., 1970, MacMillan India
7. Principles of Microbiology, 1997. 2nd International Edition, Ronald M Atlas, McGraw Hill.
8. Brock Biology of Microorganisms, 2006. Michael T.Madigan & John K.Martinko, 11th edition, Pearson Prentice Hall, Printed in USA.
9. Medical Microbiology, 1997. 15th Edition, David Greenwood, Richard Slack and John Peutherer, ELST Publishers.
10. Talaro, K. & Talaro, A. 1999. Foundations in Microbiology, Third edition, Dubuque, McGraw Hill.
11. Tortora G.J., Funke, B.R. & Case C.L.   1999. Microbiology: An Introduction, 6th edition, Benjamin/Cummings Publishing, Menlo Park California.

SEMESTER: III
EVOLUTION

CORE: 13   **CREDITS: 4**   **Subject Code: P1ZYC33**

Contact hours per Week – 6 hours
Contact hours per Semester – 90 hours

Objectives:

 ➢ To learn the origin of earth and process of evolution
 ➢ To understand the mechanism of formation of new species
 ➢ To study the socio-cultural aspects of human evolution

UNIT – I   **(18 hours)**

Evidences and Theories of Evolution

Origin of life – evidences for evolution from Biogeography, comparative anatomy, embryology, Physiology, biochemistry, palaeontology and genetics

Theories of evolution – Darwinism, Lamarckism, and Mutation theory of De Vries

UNIT – II   **(18 hours)**

Sources of variability and Isolation

Genetics basis of variation – mutation – neutralist hypothesis – hybridization and evolution – Role of isolating mechanism – pre mating and post mating problems of isolating mechanisms

Adaptive radiation – Darwin finches

Mimicry – types and their role in evolution

UNIT – III   (18 hours)
Origin of Species

Species concepts – Morphological and Biological speciation – Structure of Species, Genetics and Ecology of speciation, Factors influencing speciation, Modes of speciation – Allopatric and Sympatric speciation

UNIT – IV   (18 hours)
Modes of Evolution

Origin of higher categories – Simpson's definition, polyploidy – modes of origin of higher categories – mosaic mode – connecting link – quantum evolution –Simpson's adaptive grid – rates of evolution, punctuated equilibrium – Extinction and its causes

UNIT – V   (18 hours)
Origin and Evolution of Man

Fossil records of human evolution – recent findings in East and South Africa – Trends in human evolution – cultural evolution – Osteodentokerotic culture –Pebble tool culture – Paleolithic culture – Neolithic culture – Language   Self awareness and Death awareness – Sociobiology – Selfish gene – Altruism – kin selection

Text Books
1. Veer Bala Rastogi, 2006, Organic Evolution

Reference Books
1. Moody, P.A, 1978 Introduction to Evolution, Harper International.
2. Stebbins, G.L, 1979, Process of organic evolution, prentice Hall India.
3. Dodson, E.O, 1980, Evolution, Reinhold.
4. Bendall, D.D, 1983, Evolution from molecule to Man, Cambridge University Press.
5. Grese, M., 1983, Dimensions of Darwinism, Cambridge University Press.
6. Minkoff, E.C, 1984, Evolutionary Biology, Addison Wesley.
7. Montangu, 1980, Socio biology Examined, Oxford University Press.
8. Weiss, M.L.Mann, A.E, 1985, Human biology and behaviour – An Anthropological Perspective, 4th Edition, Little Brown &Co.

SEMESTER: III
SERICULTURE

ELECTIVE: 2	CREDITS: 4	Subject Code: P1ZYE31

Contact hours per Week – 6 hours

Contact hours per Semester – 90 hours

Objectives:
➢ To learn the biology of silkworm and mulberry
➢ To familiarize the technology of silkworm rearing
➢ To demonstrate the applied aspects of sericulture

UNIT – I   TAXONOMY AND BIOLOGY OF MULBERRY   (18 hours)

Taxonomic classification and varieties of mulberry- methods of propagation and cultivation – harvesting and storage of leaves – nutritional composition of mulberry leaves –pests and diseases of mulberry –control measures.

UNIT – II   TAXONOMY AND BIOLOGY OF SILKLWORM   (18 hours)

Taxonomic classification of mulberry silkworm – life cycle – morphology of egg larva pupa and adult-anatomy of silkworm larva – embryonic development of silkworm-hibernation of eggs-voltinism

UNIT – III REARING TECHNOLOGY   (18 hours)

Rearing house –rearing appliances .Brushing –rearing of young age and late age silkworms – Care during rearing –moulting and cleaning –optimum environmental condition- marketing –spinning –harvest, storage and marketing of cocoons –diseases of silkworm –mode of infection, symptoms and control measures. Silkworm pests and control measures.

UNIT – IV SEEDS T   (18 hours)

Grainage operation and egg production –stock maintenance –selection of seed cocoons production-procurement of seed cocoons –moth emergence –copulation- sex separation- decoupling –mother moth examination –oviposition –sterilization of the eggs- preservation and protection –egg cards and loose eggs. Artificial hatching –hot acid treatment and cold acid treatment –incubation of eggs

UNIT _ REELING AND ECONOMICS   (18 hours)

Reeling technology –cocoon stifling- cocoon boiling and brushing methods and advantages disadvantages-reeling operation reeling machines-objective of raw silk testing and parameters- sericulture farm management- economic of sericulture – Current status of sericulture in India and international level – Role of Biotechnology in Sericulture.

Text books:-
1. **G.Ganga and Sulochana chetty** 2010, An Introduction to Sericulture, Oxford and IBH Publishing.Co.Pvt.Ltd. New Delhi.

Reference Books:
1 **Rangaswami**, et.al, 1995, sericulture manual 1 Mulberry cultivation, FAO. Oxford and IBH Publishing.Co.Pvt.Ltd. New Delhi.
2. **Dilip De Sarker**, 1998 The Silkworm Biology, Genetics, And Breeding, Vikas Publishing House, New Delhi.
3. **Tribhuwar Singh**,et.al 2004 Principles and Techniques of Silkworm Seed Production, Discovery Publishing House, NewDelhi.
4. **S.Krishnaswami**, et.al, 1995 sericulture manual 2 Silkworm rearing, FAO. Oxford and IBH Publishing.Co.Pvt.Ltd. New Delhi.
5. Ullal, et.al 1994 Hand book of practical sericulture, 4th edition central silk board,Banglore.

6. **S.Krishnaswami**, et.al, 1995 sericulture manual 3 Silk reeling, FAO. Oxford and IBH Publishing.Co.Pvt.Ltd. New Delhi.

SEMESTER: III

LAB: IMMUNOLOGY

CORE: 14   **CREDITS: 3**   **Subject Code: P1ZYC3P1**

Contact hours per Week – 3 hours

Contact hours per Semester – 45 hours

1. Chick – Lymphoid organs and Histology of lymphoid organs
2. Preparation and Immunisation of Antigen
3. Bleeding and preparation of Antiserum
4. Preparation of Single Cell suspension (Chick and Goat)
5. Isolation and separation of T and B lymphocytes
6. Haemagglutination (sample collection from clinical lab only)
7. Isolation and Quantification of Immunoglobulin from serum
8. Qualitative Ouchterlony technique
9. Immunoelectrophoresis of Human serum & Antiserum
10. Measurement of Intracellular Reactive Oxygen Species production by Leucocytes (in Tilapia)
11. Spotters – Immunoglobulin G and A, 96 Well plate, Di george syndrome, Nude mouse.

SEMESTER: III

LAB: MICROBIOLOGY

CORE: 15   **CREDITS: 3**   **Subject Code: P1ZYC3P2**

Contact hours per Week – 3 hours

Contact hours per Semester – 45 hours

1. Modes of sterilization.
2. Preparation of culture media (Liquid and Solid) and agar slants for microorganisms.
3. Counting of Viable cells by serial dilution – Spread plate and Pour plate.
4. Motility determination
5. Standard qualitative analysis of water – MPN method
6. Estimation of Microflora of milk by Methylene Blue Reductions. (MBR)
7. Gram staining
8. Biochemical tests – IMViC and Catalase
9. Extracellular enzyme activities of microorganisms – Amylase/ Protease/ Lipase
10. Isolation of nitrogen fixing symbiotic bacteria from root nodule.

SEMESTER: IV

DEVELOPMENTAL BIOLOGY

CORE: 16   **CREDITS: 4**   **Subject Code: P1ZYC41**

Contact hours per Week – 6 hours

Contact hours per Semester – 90 hours

Objectives

➢ To get a basic knowledge of formation of new life

➢ To learn the complex processes involved in the development of organisms

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⮞ To understand the developmental aspects of malignancy

UNIT – I (20 Hours)
History and scope of Embryology

Historical perspectives – Theories – Preformation, Epigenesis, Baers law, Biogenetic law, Pangenesis, Germplasm, Mosaic and Regulative theory

Gametogenesis – Spermatogenesis – Anatomy of Human testis, Differentiation of Spermatozoa, Comparative study of Spermatozoa

Oogenesis – Anatomy of a vertebrate ovary, Differentiation of Ova, Nuclear activities of egg during growth phase.

UNIT – II (20 Hours)
Fertilization

Approach of spermatozoan to egg – Activation of egg – Changes in the egg cytoplasm – Blocks to polyspermy – metabolic activation of the egg – Fusion of genetic material

Fertilization in Chick – Ovulation, Maturation and fertilization of accessory layers around the fertilized ovum

UNIT –III (15 Hours)
Chick Development

Structure and Chemistry of hen's egg

Cleavage and Blastulation, Fate map of Discoblastula, Gastrulation movements, Formation of Primitive streak, Avian Morphogenetic movements, Neurulation and Tubulation

Development of Extra embryonic membrane in Chick

UNIT – IV (20 Hours)
Organogenesis

Primary organ rudiments, Organizer concept, Spemann's primary organizer, Neural induction, Induction and Differentiation of Brain, Eye, Ear, Limb, Kidney, in Chick.

Inductive tissue interactions in development

UNIT – V (15 Hours)
General Topics

1. Role of Cell death in development, Teratogenesis, Malignant growth, Neoplasia.
2. Menstrual cycle, Placental and Parturition hormones
3. Genetical aspects of development
4. Impotency, Sterility, Artificial insemination, Test-tube baby
5. Immunocontraception
6. Spontaneous abortion (types)

Text Book

1. Balinsky B.L., ,1981, An introduction to Embryology, 5th edition, Saunders college Publishing

Reference

1. Berrill, N.J, 1974. Developmental Biology, Tata McGraw Hill Publication
2. Bruce. M. Carlson, 2007. Foundation of Embryology. 6th edition, Tata McGraw Hill Publication
3. Leon. W. Browder, 1984. Developmental Biology, 2nd edition, CBS College Pub.

SEMESTER: IV
ANIMAL PHYSIOLOGY

CORE: 17   **CREDITS: 4**   **Subject Code: P1ZYC42**

Contact hours per Week – 6 hours
Contact hours per Semester – 90 hours

Objectives:
➢ To learn the structure and physiology of various organs
➢ To understand the functioning of organ systems in living being
➢ To demonstrate the role of hormones in physiological processes

UNIT – I   **(20 hours)**

Nutrition and Digestion

Nutritional requirement –components of adequate diet-Digestion – Intracellular & Extracellular digestion – Digestive enzymes - digestion of protein, carbohydrate & fat – Absorption at different regions- co-ordination of digestive activities & control of digestive secretions. Metabolism – metabolic rate- metabolism of protein, carbohydrate & fat

Respiratory quotient, Energy storage

Ectotherms & endotherms – mechanism of temperature regulation

UNIT – II   **(20 hours)**

Respiration, Circulation Excretion and Osmoregulation

Mammalian lung – respiratory pigments – transport of oxygen & carbon dioxide, oxygen as a limiting factor in environment – acclimation & acclimatization – physiological adaptation at high altitudes & in deep sea

Body fluids – patterns of circulation in vertebrates – pacemaker of myogenic heart – regulation of blood flow & blood pressure – valves & stopcock, elasticity of blood vessels& sustained pressure, peripheral resistance, vasomotor reflexes, vasoconstrictor & vasodilator substances

Excretion of nitrogenous wastes – ammonotelic, ureotelic & uricotelic animals

Osmoregulation – osmoregulators & osmoconformers, osmoregulation in aquatic, terrestrial & desert animals. Osmoregulatory organ – kidney – urine – formation – glomerular filtration – tubular reabsorption, tubular secretion- pH regulation by kidney, concentrating mechanism of nephron

UNIT – III   **(15 hours)**

Nervous system & Sense organs

Central nervous system – Autonomous nervous system, Neuron – structure- Transmission of signals in a single neuron – transmission of signals between neurons – membrane potentials – measuring membrane potentials – resting, action potentials – ionic basis of action potential – neurotransmitter substances – pharmacological effects of neurotransmitters.

Sense organ in vertebrates – chemoreceptor, mechanoreceptor, thermoreceptor, photoreceptor

UNIT – IV   **(15 hours)**

Muscle & Movement

Types of muscle – ultrastructure of striated muscle – contraction of sarcomere – sliding filament theory – cross bridge activity – role of calcium ion – cross bridge

attachment – excitation – contraction coupling – neuromuscular junction – insect flight muscle – physiology of electric organ

UNIT – V   (20 hours)
Endocrine glands and reproduction

Glandular secretions – endocrine & exocrine glands, endocrine systems – chemical types – regulation of hormone secretion – glandular hormones – neurohormones – mechanism of hormone action – metabolic & developmental of hormones – glucocorticoids & catecholamines, growth hormones, insulin, thyroxine, epinephrine & norepinephrine.

Hormones that regulate water & electrolyte balance – antidiureitic hormone, aldosterone, parathyroid hormone.

Reproductive hormone – male & female sex hormones, oestrous cycle in mammals – menstrual cycle – hormonal action in insect metamorphosis

References
1. Eckert Animal Physiology : Mechanisms & Adaptations, 4 th Edition, Randall D., Buurggren W., French K., 1997, W.H. Freeman and Company, New York
2. Animal Physiology: Adaptation and Environment, 4 th Edition , Knut Schmidt Nielson., 1994, Cambridge University Press.
3. Comparative Animal Physiology, 3 rd Edition, Prosser C.L., 1984, W B. Saunders Company.

Text Books
1. Text Book of Animal Physiology, 2 nd Edition, Nagabhushanam R., Kodarkar M.S., Sarojini R., 1999, Oxford & IBH
2. General & Comparative Physiology, 3 rd Edition Hoar W.S., 1984, Prentice Hall of India.

SEMESTER: IV
BIOTECHNOLOGY

CORE: 18   **CREDITS: 4**   **Subject Code: P1ZYC43**
Contact hours per Week – 6 hours
Contact hours per Semester – 90 hours

Objectives
➢ To familiarize the tools and techniques of genetic engineering to make or modify products or processes
➢ To explain the methods of production of genetically modified organisms for human welfare
➢ To find solution of problems concerning human activities including agriculture, industry, environment and healthcare

Unit I   (18 Hours)
Tools of Gene cloning

Cloning vectors: Properties of a cloning vector
Types of cloning vectors: plasmids (pBR322, pBR327, pUC); phages (lambda phage, M13); cosmids, Phagemids, viruses, BAC, YAC and MAC
Shuttle vectors and expression vectors
Enzymes for rDNA technology: Restriction enzymes and Ligases
cDNA Bank and Gene Bank
DNA Sequencing: Maxam and Gilbert's chemical degradation method, Sanger's dideoxynucleotide synthetic method

Gene mapping: DNA Microarray in Gene Mapping

Unit II   (18 Hours)
Methods of Gene cloning

Gene cloning in *E.coli*, Yeast, Plant and animal cells

Construction of chimeric DNA (Blunt end ligation, cohesive end ligation, homopolymer tailing, use of linkers)

Gene transfer methods: Transformation, Colony hybridization, Electroporation, Microinjection, Shot gun cloning, liposome mediated gene transfer, DEAE-Dextran, Viral vectors

Selection of clones - blue white selection method, colony hybridization, Plaque hybridization

Amplification - Multiplication, Expression and integration of the DNA insert in host genome

Recovery of cells

Unit III   (18 Hours)
Animal Cell Culture Techniques

Composition and Types of Culture media

Bioreactors: Design and Types

Establishment of Primary culture and cell line

Disaggregation of Tissue – Physical and Chemical method

Types of culture: Tissue culture, Organ culture, Embryo Culture

IVF and Embryo transfer in human and farm animals

Method of production of transgenic animals and their applications

Stem cells: Characteristics and applications

Unit IV   (18 Hours)
Industrial Biotechnology

Isolation of microbes for enzyme production

Methods of strain improvement for industrially important secondary metabolites

Downstream process: Centrifugation, Extraction, Purification, Product recovery

Fermenters: Design and Types

Applications of microbes in industrial biotechnology: Ore leaching, Cellulose utilization, Alcohol production and Antibiotic biosynthesis

Enzyme immobilization: Need for immobilization

Methods of immobilization: Coupling, Covalent Binding, Cross Linking, Adsorption, Entrapment, Microencapsulation

Applications of immobilized enzymes

Unit V   (18 Hours)
Biotechnology and Healthcare

Vaccine: Production of recombinant vaccine, DNA vaccine

Disease Diagnosis: DNA as Diagnostic and Therapeutic agent

Recombinant DNA in Medicine

rDNA and Environment: Biosensors, GMO in Bioremediation of Oil spill, heavy metals and tetrachloroethylene

Ethics of rDNA technology: Hazards of Biotechnology - Human safety - Animals and ethics, BRAI

Legal issues: IPR, Patent, Copyright, Trade secrets and Trademarks

Textbooks

1. Biotechnology: Principles and Applications, Rastogi S.C., 2009, Narosa Publishing House Pvt Ltd.
2. A Textbook of Biotechnology, Dubey R.C., S. Chand & Company Ltd
3. Elements of Biotechnology, Gupta P.K., 2003, Rastogi Publications

Reference books

1. Principles of Gene Manipulation, 5th Edition, Old R.W. and Primrose S.B., 1996, Blackwell Science
2. Molecular Biotechnology: Principle and Applications of Recombinant DNA, 2nd Edition, Glick B.R., Pasternack J.J., 1988, ASM Press
3. Biotechnology: Principles and Applications, Higgins E.J., Best D.J., Jones J., 1988, Blackwell Science
4. From Genes to Clones: Introduction to Gene Technology, Winnacker E.L., 1987, Panima Educational Book Agency
5. Recombinant DNA, 2nd Edition, James D Watson, Michel Gilman, Jan A Witkowski and Mark Zoller, 1992, W.H. Freeman

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SEMESTER: IV
AQUACULTURE

ELECTIVE: 3   **CREDITS: 4**   **Subject Code: P1ZYE41**

Contact hours per Week – 6 hours
Contact hours per Semester – 90 hours

Objectives
- To gain knowledge on sustainable aquaculture practices
- To understand the nutritional requirements of fish.
- To learn induced breeding technique and hatchery management of commercially important cultivable fishes

UNIT – I

Scope of aquaculture – basic qualification of candidate species – cultivable fresh water and marine species

Construction of ponds – site selection – soil and water types – types of ponds –preparation and management – aquatic weeds and their control – fertilization of ponds – status of aquaculture in India

UNIT – II

Brooders management – bundh breeding – Artificial breeding – induced spawning – application of synthetic hormones – transportation of fish seed –natural culture of fish feed organisms – phytoplankton (diatoms) Zooplanktons (Rotifers, cladocerons) Artemia, tubifex – artifical feed – feed formulations and management

UNIT – III

Ornamental fish culture – Introduction – Common ornamental fishes (Rosy barb, angel fish, gowrami,blackmolly, guppy, common gold fish)- construction of fish tank (base covering and stocking of fish), Breeding methods of ornamental fishes.

UNIT – IV

Animal husbandry cum aquaculture, agriculture cum aquaculture- Ectoparasite (Argulus and lernea), Bacterial, Viral and fungal diseases and their control measures

UNIT – V

Preservation – Drying, Salting, Smoking, Canning, Refrigeration- Marketing- Economics of fishery and its application in aquaculture – Fishery extension and Aquaculture

Text books:
1. Aquaculture, N. Armugam, 2010, Saras Publication, Nagercoil.
2. Concepts of Aquaculture, G. Santhanakumar and A.M.Selvaraj, 2005, Meenam Publications, Nagercoil.

Reference books:
1. Fish and Fisheries of India, Jingaran V.G 1997, Hindustan publishing Co., NewDelhi
2. A hand book of fish farming, Agarwal S.C 1994., Narandendra publishing house, Delhi
3. Freshwater Aquculture , Rath R.K 1993, Scientific Publishers, Jodhpur
4. Principles of Aquaculture, Zade , S.B, khune C., SiteS.R and Jigare R.V , Himalaya Publishing House, Mumbai
5. General and Applied Ichthyology (Fish and Fisheries), Gupta, S.K and Gupta P.C ., S.Chand publications – NewDelhi

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SEMESTER: IV
LAB: DEVELOPMENTAL BIOLOGY

CORE: 19	**CREDITS: 3**	**Subject Code: P1ZYC4P1**

Contact hours per Week – 3 hours
Contact hours per Semester – 45 hours

1. Invertebrate Oogenesis – Structure of Cockroach Ovary and Ovariole
2. Vertebrate Oogenesis – Rabbit - C.S. of ovary and Graffian follicle (Histological slides)
3. Spermatogenesis – Mounting of Bull Sperm
4. Developmental stages of Silkworm egg into larva
5. Chick Early developmental stages – Cleavage, Blastula, and Gastrula
6. Chick embryo – Identification of age – 24, 48, 72 and 96 Hours of age
7. Chick – Blastoderm mounting
8. Histology of Chick embryo – Development of Limb and Kidney (Transverse sections study)
9. Histology of Pig embryo – Development of Limb and Kidney (Transverse sections study)
10. Placental study – Pig and Human embryo

SEMESTER: IV
LAB :ANIMAL PHYSIOLOGY

CORE: 20	**CREDITS: 3**	**Subject Code: P1ZYC4P2**

Contact hours per Week – 3 hours
Contact hours per Semester – 45 hours

1. Effect of temperature on oxygen consumption in fish
2. Effect of temperature on opercular movement in fish
3. Effect of salinity on oxygen consumption in fish
4. Effect of salinity on opercular movement in fish
5. Salt loss in fish
6. Salt gain in fish
7. Qualitative examination of haemin crystals
8. Permeability of biological membranes

9. Sphygmomanometer   - Measurement of Blood pressure
10. Kymograph – properties of Skeletal muscle.

Course Name : **Bachelor of Science**
Discipline : **Computer Science**

Semester	Part	Subject	Hour	Credit	Marks Int+Ext	Total	Code	Revision
III	Part I	Tamil/ Hindi	6	3	25+75	100	U1PT31/ U1PH31	Revised
	Part II	English	6	3	25+75	100	U1PE31	Revised
	Core 7	Programming in JAVA	5	4	25+75	100	U1CSC31	No Change
	Core 8	Data Structures	4	4	25+75	100	U1CSC32	No Change
	Allied 3	Resource Management Techniques	4	4	25+75	100	U1MAA3C	No Change
	Core 9-Lab	Lab: Programming in JAVA	5	3	40+60	100	U1CSC3P1	No Change

Semester	Part	Subject	Hour	Credit	Marks Int+Ext	Total Marks	Code	Revision
IV	Part I	Tamil/ Hindi	6	3	25+75	100	U1PT41/ U1PH41	Revised
	Part II	English	6	3	25+75	100	U1PE41	Revised
	Core 10	Advanced JAVA Technology	5	4	25+75	100	U1CSC41	Revised
	Core 11	Computer Graphics	4	4	25+75	100	U1CSC42	No Change
	Allied 4	Numerical Methods	4	4	25+75	100	U1MAA4C	No Change
	Core12-Lab	Advanced JAVA Programming – Lab	5	3	40+60	100	U1CSC4P1	Revised

SEMESTER III
CORE 7 – PROGRAMMING IN JAVA

Contact Hours per week: 5hrs   Credits:4
Contact Hours per Semester: 65 hrs   Subject Code: U1CSC31
Objective:
        This subject helps the students to understand core JAVA features such as conditional and iterative execution methods, defining classes, invoking methods, using class libraries, Inheritance, Packages, Interface, Exception and File Handling.

UNIT I   **(11 HRS)**
Introduction: Type of Java Programs, Application Program, Applets, Servlets, Java Architecture, JDK tools, JSL, Comments, Command Line Argument, Interactive input, Java tokens, Keywords, Identifiers, Data types, Operators, Precedence, Punctuation Symbols.

UNIT II   **(15 HRS)**
Java statements, classes and objects: Input and Output statement, Control flow statement, Decision – making statements, Switch statement, Looping statements, Break, Continue, Class declaration, Naming convention, Object creation, Methods, New operator, Constructors, Finalizers, Access specifiers, Arrays.

UNIT III   **(15 HRS)**
Inheritance, Packages and Interface: Argument Passing, Call by Value, Call by reference, Polymorphism, Inheritance, Overriding methods, Runtime Polymorphism, Abstract class, User defined packages, Package creation, Package Usage, Interface, Creation of Interface, Using Interface.

UNIT IV **(14 HRS)**

String, Vector and Exception Handling: String introduction, Concatenation, Substring, String methods, String Buffer, Vector, Vector methods, Wrapper class, Exception Handling mechanism, Try Block, Catch Block, Types, Throw, Finally Block, User defined Exception.

UNIT V **(10 HRS)**

Multithreading and File Handling: Multithreading and Multitasking, Thread Life Cycle, Thread Methods, File class, Byte Stream Class Manipulation, Character Stream Class manipulation, Random Access File

Text Book:

Internet and Java Programming, 1e, By R. Krishnamoorthy and S. Prabhu, Publisher: New Age International

Unit I :	Chapters	4, 5 and 6
Unit II:	Chapters	7 and 8.1 and 8.15
Unit III:	Chapters	9 and 10
Unit IV:	Chapters	11 and 13
Unit V:	Chapters	14 and 15

Reference Book:

Programming with Java, E. Balagurusamy TMH, 4e

CORE 8 - DATA STRUCTURES

Contact Hours per week: 4 hrs   Credits:4

Contact Hours per Semester: 52 hrs   Subject Code: U1CSC32

Objective:

This subject focuses on the concepts, Operations and Applications of different Data Structures namely Array, Linked List, Stack, Queues, Graph and Tree. To get exposer on different Sorting & Searching Methods.

UNIT I **(10 HRS)**

Introduction and Overview: Definitions – Concept of Data Structure – Overview of Data Structures . Arrays: Definition – Terminalogy – One – Dimensional Array – Multidimensioal Array – Pointer Arrays. Linled Lists – Definitions – Single Linked List – Circular Linked List – Duble Linked List – Circular Double Linked List – Applications of Linked List.

UNIT II **(10 HRS)**

Stacks: Introduction- Definition – Representation of a Stack – Operations on Stack – Applications of Stacks. Queues: Introduction – Definition – Representation of Queues – Various Queue Data Structures –Applications of Queues.

UNIT III **(10 HRS)**

Tables: Rectangular Tables – Jagged Tables – Inverted Tables – Hash Tables. Graphs: Introduction – Graph Terminalogies – Representation of Graph – Operations on Graphs.

UNIT IV **(10 HRS)**

Trees: Basic Terminalogies – Definitions and Concepts – Representation of Binary Tree – Operations on Binary Tree – Types Of Binary Trees – Expression Tree – Binary Search Tree – Heap Trees – Threaded Binary Trees.

UNIT V **(12 HRS)**

Sorting : Basic Terminalogies – Sorting Techniques – Sorting by Insertion – Sorting by Selection – Sorting by Exchange – Sorting by Distribution – sorting by Merging – Simple Merge – Binary Merge. Searching: Basic Terminalogies – Linear Search Techniques- Linear Search with Array – Linear Search with Linked List - Linear Search with Ordered List - Binary Search – Non Linear Search Techniques – Binary Tree Searching – Binary Search Tree Searching.

Text Book:

Classic Data Structures, Debasis Samantha ,Second Edition, PHI
Chapters
Unit I – 1, 2, 3.1 to 3.6

Unit II – 4, 5.1 to 5.4
Unit III – 6, 8.1 to 8.4
Unit IV – 7.1 to 7.5.4
Unit V – 10.1 to 10.7.2, 11.1 to 11.2.4, 11.3.1,11.3.2

Reference Book:

"Data structures" Chitra, P.T.Rajan, Vijay Nichole imprints private Ltd.,2006

ALLIED 3 - RESOURCE MANAGEMENT TECHNIQUES

Contact Hours per week: 4 hrs   Credits:4

Contact Hours per Semester: 52 hrs   Subject Code: U1MAA3C

Objective:

To provide the student with the concept of Operations Research Techniques and problem solving in LPP, Simplex Method, Assignment Problem and Transportation Problem.

UNIT I   **(10 HRS)**

Development of OR – Definition of OR – Modeling – Characteristics & Phases – tools. Techniques & Methods – Scope of OR.

UNIT II   **(10 HRS)**

Linear Programming Problem – Formulation – Slack & Surplus Variables – Graphical Solution of LPP.

UNIT III   **(10 HRS)**

Simplex Method – Computational Procedure – Artificial Variables techniques – Big M method.

UNIT IV   **(10 HRS)**

Mathematical formulation of assignment problem – Methods for solving the assignment problems.

UNIT V   **(12 HRS)**

Mathematical formulation of transportation problem – Methods for solving the transportation problem.

Text Book:

Operation Research, S. D. Sharma, Kedar Nath Ram Nath & Co, 2004

       Unit I: Chapter 1 (1.1, 1.2, 1.4, 1.5, 1.8, 1.9, 1.10, 1.11)

       Unit II: Chapter 3 (3.1, 3.2, 3.3, 3.3.1, 3.3.2, 3.3.3, 3.3.4, 3.4, 3.5)

       Unit III: Chapter 5 (5.1, 5.2, 5.2.1, 5.3, 5.4, 5.5, 5.5.1, 5.5.2, 5.5.3, 5.5.4)

       Unit IV: Chapter 11 (11.2, 11.3 and 11.4)

       Unit V: Chapter 12 (12.2 to 12.8)

Reference Book:

1. Operation Research, Nita H. Shah, Ravi M. Gor and Hardik Soni, Prentice-Hall of India Pvt.Ltd, New Delhi, 2008.
2. Operation Research, R. Sivarethinamohan, Tata McGraw Hill, 2005.

CORE LAB 9 – PROGRAMMING IN JAVA

Contact Hours per week: 5hrs   Credits:3

Contact Hours per Semester: 65 hrs   Subject Code: U1CSC3P1

Objective:

To develop the skill to write a computer program to solve specified problems using pure object oriented concepts.

1. Using Command line arguments reverse the given number using arithmetic operators
2. Using Interactive Input, find Factorial value of any given number.
3. Using class and objects, write a program to find the sum of two complex numbers.
4. Using class and objects, write a program to compute internet usage time with the help of constructors.

5. Using subclass constructor, write a program to illustrate single inheritance.
6. Using Interface, write a program to demonstrate hybrid inheritance.
7. Illustrate string methods in a simple string manipulation program
8. Illustrate vector methods in a simple vector manipulation program.
9. Write a multi threaded program to print odd values and even values in two separate threads.
10. Illustrate thread methods in a three threaded program.
11. Illustrate Byte File usage in Java
12. Illustrate Char File usage in Java.

SEMESTER IV
CORE 10 – ADVANCED JAVA TECHNOLOGY

Contact Hours per week: 5hrs   Credits:4
Contact Hours per Semester: 65 hrs   Subject Code: U1CSC41

Objective:

This subject teaches the students to understand advanced concepts of JAVA technology such as Applet, Graphics, AWT, Event Handling, Java Script, Servlet, Networking and RMI

UNIT I: **(10 HRS)**

Applet and Graphics: Applet life cycle, Applet methods, Passing parameters to Applets, getDocumentBase() and getCodeBase(), Using images, Applet interfaces, Difference between Applet and Application Program, Drawing lines and different Shapes, Clipping.

UNIT II: **(15 HRS)**

AWT and Event Handling: Introduction, Component, Frame, Button class, Layout Management, Insets, Canvas, Label, Text field, Check Box, Check Box Group, Choice, List, Menu, Event handling, Adapter class.

UNIT III: **(14 HRS)**

HTML and Java Script: HTML Editors, Elements, Tags, Minimal HTML Document, Markup Tags, Java Script, Java Script and the Language, Java Script and Java, Strengths and Weakness of Java Script.

UNIT IV: **(15 HRS)**

Servlet: Introduction, DHTML, CGI script, Java Servlet, Servlet Container, Servlet Life Cycle, Servlet Interface, Generic Servlet Class, HttpServlet Class, HttpServlet Interface, getOutputStream method, SetHeader() method, parameter passing to servlet, More about Servlet Owner, Java Web Server and Cookies.

UNIT V: **(11 HRS)**

Networking and RMI: TCP/IP, UDP/IP, IP Address, DNS, Port, URL, Socket Programming using TCP/IP and UDP/IP, RMI packages, Programming using RMI.

Text Book:

Internet & Java Programming, 1e, R. Krishnamoorthy and S. Prabhu, Publishers: New Age International

UNIT I: Chapters   16 and 17
UNIT II: Chapters   19
UNIT III: Chapters   25
UNIT IV: Chapters   22
UNIT V: Chapters   18 and 21

Reference Book:

Java Complete Reference, Herbert Schildt, Tata Mc Graw Hill, 2008

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CORE 11 - COMPUTER GRAPHICS

Contact Hours per week: 4 hrs   Credits:4

Contact Hours per Semester: 52 hrs   Subject Code: U1CSC42

Objective:

        To learn the overview of graphics systems, output primitives and two dimensional geometric operations with viewing.

UNIT I: **(10 HRS)**

A Survey of Computer Graphics: Computer-Aided Design – Presentation Graphics – Computer Art – Entertainment – Education and Training – Visualization – Image Processing – Graphical User Interfaces. Overview of Graphics Systems: Video Display Devices – Raster Scan Systems – Random Scan Systems – Input Devices – Hard Copy Devices.

UNIT II: **(10 HRS)**

Output Primitive: Points and Lines - Line Drawing Algorithms - Circle Generating Algorithms - Ellipse Generating Algorithms - Filled Area Primitives.

UNIT III: **(10 HRS)**

Attributes of Output Primitives: Line Attributes - Curve Attributes - Color and Gray Scale Levels - Area Fill Attibutes - Character Attributes - Bundled Attributes - Inquiry Functions - Antialiasing.

UNIT IV: **(10 HRS)**

Two - Dimensional Geometric Transformations: Basic Transformations - Matrix Representations - Composite Transformations - Other Transformations - Transformations between Coordinate Systems.

UNIT V: **(12 HRS)**

Two- Dimensional viewing: The Viewing Pipeline - Viewing Coordinate Reference Frame - Window-to-Viewport Coordinate Transformation - Two-Dimensional Viewing Functions - Clipping Operations - Point Clipping - Line Clipping - Polygon Clipping - Curve Clipping - Text Clipping - Exterior Clipping.

Text Book:

        Computer Graphics - Donald Hearn, M. Pailine Baker, Prentice Hall of India Pvt. Ltd., New Delhi, 2nd edition, 1994

                UNIT I: Chapters   1.1 - 1.8,2.1 - 2.3,2.5,2.6

                UNIT II: Chapters   3.1 - 3.2, 3.5 - 3.7, 3.11

                UNIT III: Chapters   4.1 - 4.8

                UNIT IV: Chapters   5.1 - 5.5

                UNIT V: Chapters   6.1 - 6.11

Reference Book:

1. Computer Graphics, Pradeep K.Bhatia, I.K.International pvt ltd, 2008
2. Fundamentals of Computer Graphics, Peter Shirley, Michael Ashikhmin, Second Edition, 2005

NUMERICAL METHODS

Contact Hours per week: 4 hrs   Credits:4

Contact Hours per Semester: 52 hrs   Subject Code: U1MAA4C

Objective:

        To give better skills for solving mathematical problems by Numerical Methods in the area Algebraic Equation, Simultaneous Equation, Interpolation, Differentiation, Integration and Differential Equation

UNIT I   **(10 HRS)**

        Algebraic and Transcendental Equations: Introduction – Errors in Numerical Computation – Iteration Method – Bisection Method – Regular Falsi Method – Newpton Raphson Method – Horner's Method.

UNIT II   **(10 HRS)**

        Simultaneous Equations: Introduction - Simultaneous Equations – Back Substitution – Gauss Elimination Method – Gauss Jordan Elimination Method – Calculation of Inverse of a Matrix –

Crout's Method – Iterative Methods – Gauss Jacobi Iteration Method – Gauss Seidal Iteration Method – Relaxation Method - Newpton Raphson Method for Simultaneous Equations.

UNIT III (10 HRS)

Interpolation: Introduction – Newton's Interpolation Formulae – Central Difference Interpolation Formulae – Lagrange's Interpolation Formula – Divided Differences – Newton's Divides Differences Formula – Inverse Interpolation – Hermite's Interpolating Polynomial.

UNIT IV (10 HRS)

Numerical Differentiation and Integration: Introduction – Derivatives using Newton's Forward Difference Formula - Derivatives using Newton's Backward Difference Formula – Derivatives using Central Difference Formula – Numerical Integration – Gaussian Quadrature Formula – Numerical Evaluation of Double Integrals.

UNIT V (12 HRS)

Numerical Solutions of Ordinary Differential Equations: Introduction – Taylor's Series Method – Picard's Method – Euler's Method – Runge-Kutta Methods – Predictor Corrector Method – Milne's Method – Adams-Bashforth Method – Simultaneous First Order Differential Equations – Second Order Differential Equations.

Text Book:

1. Numerical Method, S.Arumugam, A.Thangapandi Isaac, A.Somasundaram, Second Edition, SCITECH Publications.

    Chapters:
    Unit I – 3
    Unit II – 4
    Unit III – 7
    Unit IV – 8
    Unit V – 10

Reference Book:

Mathews J.H. "Numerical Methods for Maths, Science and Engineering", PHI, New Delhi, 2001.

CORE LAB 12 - ADVANCED JAVA PROGRAMMING

Contact Hours per week: 5hrs   Credits:3
Contact Hours per Semester: 65 hrs   Subject Code: U1CSC4P1

Objective:

To develop the skill to write a computer program to solve specified problems using advanced features in JAVA

1. Write a program using Applet, to illustrate applet life cycle.
2. Write an applet program that receives interactive input using TextField and displays sum, difference of two integers.
3. Write an applet for growing text and an image
4. Using SetBackground and SetForeground methods, change colors of a shape in applet randomly.
5. Write a program to create a menu for a typical Banking system using AWT components.
6. Design a Scientific calculator using AWT.
7. Write a HTML to find sum of two numbers using JavaScript.
8. Write a HTML to check Password validity using JavaScript.
9. Illustrate Servlet methods in a simple program.
10. Illustrate the parameter passing usage in servlet program.

Course Name : **Master of Science**
Discipline : **Computer Science**

Semester	Part	Subject	Hour	Credit	Marks Int+Ext	Total	Code	Revision
III	Core 11	Open Source Technology	5	4	25+75	100	P1CSC31	New
	Core 12	Software Project Management	5	5	25+75	100	P1CSC32	Revised
	Core 13	Principles of Compiler Design	5	5	25+75	100	P1CSC33	New
	Core 14-Lab	Software Development Lab	5	3	40+60	100	P1CSC3P1	New
	Core 15-Lab	Open Source Programming	5	3	40+60	100	P1CSC3P2	New
	Elective 2	Wireless Communication/ Operating System Design	5	5	25+75	100	P1CSE31	New / Revised

Semester	Part	Subject	Hour	Credit	Marks Int+Ext	Total	Code	Revision
IV	Elective 3	Project & viva-voce	20	10	80+120	200	P1CS4PV	No change
	Core 16	Soft Computing	5	4	25+75	100	P1CSC41	Revised
	Core 17	Data Mining and Warehousing	5	4	25+75	100	P1CSC42	New

SEMESTER III
OPEN SOURCE TECHNOLOGY

Contact Hours per week: 5hrs   **Subject Code: P1CSC31**
Contact Hours per Semester: 65 hrs
Credit: 4
Objective:
- Understand Linux Programming and make them to develop applications using it.
- Understand the programming constructs of PHP Scripting Language
- Work with PHP and interact with MySQL database.
- Developing web pages using PHP and HTML forms.

Unit I   **(12 hours)**

Getting started - Introduction to UNIX, Linux and GNU - Programming Linux.

Shell Programming - basics - Pipes and Redirection - The Shell as a Programming Language – shell syntax

Working with files - Linux File Structure - System Calls and Device Drivers - Library Functions - Low-Level File Access - The Standard I/O Library

Unit II   **(12 hours)**

Working with files - Formatted Input and Output - File and Directory Maintenance - Scanning Directories - Errors - The / proc File System.

The Linux Environment - Program Arguments - Environment Variables - Time and Date - Temporary Files - User Information - Host Information - Logging Resources and Limits.

Terminals - Reading from and writing to the Terminal - Talking to the Terminal - The Terminal Driver and the General Terminal Interface - The termios structure - Terminal Output - Detecting Keystrokes.

Unit III   (14hours)

Why PHP & MySQL – What is PHP? – What is MySQL? – Reasons to love PHP and MySQL

Server - Side Web Scripting - Static HTML - Client-Side Technologies - Server-Side Scripting - What Is Server-Side Scripting Good for?

Syntax and Variables – Comments – variables – simple types – outputs

Control and Functions – Boolean expressions – branching – looping –terminating execution – using functions – function documentation – defining your own function – functions and variable scope – function scope

Unit IV   (13 hours)

Passing Information between Pages - GET Arguments - POST Arguments - Formatting Form Variables - PHP Super global Arrays.

String - Strings in PHP - String Functions.

Arrays and Array Functions - Creating Arrays - Retrieving Values - Multidimensional Arrays - Inspecting Arrays - Deleting from Arrays - Iteration.

Numbers - Numerical Types - Mathematical Operators - Simple Mathematical Functions - Randomness.

Unit V   (14 hours)

PHP/MYSQL Functions - Connecting to MySQL - Making MySQL Queries - Fetching Data Sets - Multiple Connections - Error Checking - Creating MySQL Databases with PHP - MySQL Functions.

Displaying Queries in Tables - HTML Tables and Database Tables - Complex mapping - Creating the sample Tables.

Building Forms from Queries - HTML Forms - Basic Form Submission to a Database - Self Submission - Editing Data with an HTML Form.

Textbook:

1) Neil Matthew and Richard Stones (2009). Beginning Linux Programming, 4/e; New Delhi: Wiley-India
2) Tim Converse and Joyce Park with Clark Morgan (2008). PHP 5 and MySQL Bible; New Delhi: Wiley-India

Unit I: Chapter 1, 2, 3(Text book 1)
Unit II: Chapter 3, 4, 5(Text book 1)
Unit III: Chapter 1, 2, 5, 6(Text book 2)
Unit IV: Chapter 7, 8, 9, 10(Text book 2)
Unit V: Chapter 15, 16, 17(Text book 2)

Reference Book:

Open Source Technology, Kailash Vadera, Bhavyesh Gandhi, Laxmi Publications

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SOFTWARE PROJECT MANAGEMENT

Contact Hours per week: 5hrs   **Subject Code: P1CSC32**
Contact Hours per Semester: 65 hrs
Credit: 5
Objective:

The aim is to facilitate an updated study of software project management with respect to the contemporary developments in the field.

UNIT I   **(13 hours)**

Introduction to software Project Management – Why software project management Important – what is a project – Software project Vs Other types of project – Contract Management and Technical project management – Activities covered by software project management – Plans, Methods and Methodologies – Stakeholders – The business case – Project success and failure – Management control – Traditional Vs Modern project management practices. Project Evaluation and Programme Management – Project Portfolio Management – Evaluation of Individual Projects – Cost-benefit Evaluation Techniques – Risk Evaluation – Programme Management – Managing the Allocation of Resources within Programmes – Strategic Programme Management – Creating a Programme – Aids to Programme Management – Some Reservation about Programme Management – Benefits Management

UNIT II   **(13 hours)**

An overview of Project Planning – Introduction to step Wise Project Planning – Step 0 : Select Project – Step 1: Identify Project Scope and Objectives – Step 2: Identify Project Infrastructure – Step 3 : Analyse Project Characteristics – Step 4 : Identify Project Products and Activities –Step 5: Estimate Effort for Each Activity – Step 6: Identify Activity Risks – Step 7: Allocate Resources - Step 8: Review/Publicize Plan – Step 9 and 10 : Execute Plan/Lower Levels of Planning. Selection of an Appropriate Project Approach – Choosing Methodologies and Technologies – Software Process and Process Models – choice of Process Models – Structure Vs Speed of Delivery – The Waterfall Model – The Spiral Model – Software Prototyping – Incremental Delivery – Atern/ Dynamic Systems Development Method – Rapid Application Development – Agile Methods – Extreme Programming – Scrum – Managing Iterative Process – Selecting the Most Appropriate Process Model.

UNIT III   **(13 hours)**

Software Effort Estimation – where does Estimate done – Problems with over and Under Estimates – The basics for software estimating – Software Effort Estimation Techniques – Bottom-up Estimating – The Top – down Approach and parametric models – Expert Judgement – Estimating by Analogy – Albrecht function point analysis – Function points MarkII – COSMIC Full Function Points – COCOMO II: A Parametric Productivity Model – Cost Estimation – Staffing patterns – Effect of schedule Compression – Capers Jones Estimating Rules of Thumb. Activity Planning – The objectives of Activity Planning – When to plan – Project Schedules – Projects and Activities – Sequencing and scheduling Activities – Network Planning models – Formulating a Network Model – Adding the Time Dimension – The Forward pass – The Backward pass – Identifying the critical path – Activity Float – Shortening the project duration – Identifying critical Activities – Activity on Arrow Networks. Risk Management –Risk – categories of Risk – A Framework for Dealing with the Risk – Risk Identification – Risk Assessment – Risk Planning – Risk Management – Evaluating Risks to the schedule – Applying the PERT Technique – Monte Carlo Simulation – Critical Chain Concepts.

UNIT IV   **(13 hours)**

Resource Allocation – The Nature of Resources – Identifying Resource Requirement – Scheduling Resources – Creating Critical Path – Counting the cost – Being specific – Publishing the Resource Schedule – Cost Schedule – The Scheduling Sequence. Monitoring and Control – Creating the Framework – Collecting the Data – Review – Project Termination Review – Visualizing Progress – Cost Monitoring – Earned Value Analysis – Prioritizing Monitoring – Getting the project Back to

Target – Change Control – Software Configuration Management. Managing Contracts – Types of Contracts – Stages in Contract placement – Typical Terms of a Contract – Contract Management – Acceptance.

UNIT V   (13 hours)

Managing People in Software Environment – Understanding Behavior – Organizational Behavior – Selecting the Right person for the job – Instruction in the Best Methods – Motivation – The Oldham-Hackman Job Characteristics Model – Stress – Health and Safety – Some Ethical and Professional Concerns. Working in Teams – Becoming a Team – Decision Making – Organization of Team Structures – Coordination Dependencies – Dispersed and Virtual Teams – Communication Genres – Communication Plans – Leadership. Software Quality – The place of Software quality in Project Planning – The Importance of Software Quality – Defining Software Quality – ISO 9126 – Product and Process Metrics – Product Vs Process Quality Management – Quality Management systems – Process Capability Models – Techniques to Help Enhance Software Quality – Testing – Software Reliability – Quality plans

Text book:

" Software Project Management " by Bob Huges, Mike Cotterell, Rajib Mall Fifth Edition, Special Indian Edition, Tata McGraw Hill Education Private Limited, 2009.

UNIT I : Chapter 1, 2
UNIT II   : Chapter 3, 4
UNIT III   : Chapter 5, 6, 7
UNIT IV   : Chapter 8,9,10
UNIT V   : Chapter 11, 12, 13

Reference Book:

" Effective Software Project Management ' by Robert K.Wysocki, Wiley Desktop Edition

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PRINCIPLES OF COMPILER DESIGN

Contact Hours per week: 5hrs   **Subject Code: P1CSC33**
Contact Hours per Semester: 65 hrs
Credit: 5

Objective:
  • To understand, design and implement a lexical analyzer.
  • To understand, design and implement a parser.
  • To understand, design code generation schemes.
  • To understand optimization of codes and runtime environment.

UNIT I   (13 hours)

Compilers And Translators-Why Do We Need Translators?-The Structure Of A Compiler-Lexical Analysis-Syntax Analysis-Intermediate Code Generation-Optimization-Code Generation-Book Keeping-Error Handling-Compiler-Writing Tools-Getting started. The role of the lexical analyzer-Simple approach to design of a lexical analyzer-Regular Expressions-Finite Automata-From regular expression to finite automata-Minimizing the number of states of a DFA-A language for specifying lexical analyzer-Implementing a lexical analyzer- The scanner generator as Swiss army Knife

UNIT II   (13 hours)

The Syntactic Specification of Programming Languages-Derivation and Parse Trees-Capability of context free Grammars. Parsers-Shift-reduce Parsing-Operator-precedence parsing-Top-down parsing-Predictive Parsers

UNIT III   (13 hours)

LR parsers-The canonical collection of LR(0) items-constructing SLR parsing tables-constructing canonical LR parsing tables-constructing SLR parsing tables-constructing LALR parsing tables-Using Ambiguous grammars- An automatic parse generator Implementation of LR parsing Tables-constructing LALR set of items. Syntax directed translation schemes – Implementation if syntax directed schemes-Intermediate Code-Parse Tree and Syntax Trees -Three-Address code, quadruples,

and triples-Translation of assignment statements-Boolean Expression-Statements that alter the flow of control-postfix translations-Translation with a top-down parser

UNIT IV   (13 hours)

The contents of a symbol tables-Data structure for a symbol table-Representing Scope information. Errors-Lexical-phase errors-syntactic-phase errors-Semantic errors. The principal sources of optimization-Loop optimization -The DAG representation of basic blocks-Value numbers and algebraic laws-Global data-flow analysis

UNIT V   (13 hours)

Dominators-Reducible Flow graphs -Depth-first search-Loop-invariant computations -Induction variable elimination-Some other loop optimization. Code Generation-Object Programs- A machine Model- A simple code generator-Register allocation and assignment-Code generation from DAG's-Peephole Optimization

Text Book:

" Principles of Compiler Design", Alfred V.Aho and Jeffrey D.Ullman. 25th Reprint, 2002.

        UNIT I: Chapter 1,3
        UNIT II: Chapter 4,5
        UNIT III: Chapter 6,7
        UNIT IV: Chapter 9,11,12
        UNIT V: Chapter 13,15

Reference Book:

        1. Allen I. Holub "Compiler Design in C", Prentice Hall of India, 2003.
        2. C. N. Fischer and R. J. LeBlanc, "Crafting a compiler with C", Benjamin Cummings, 2003.
        3. J.P. Bennet, "Introduction to Compiler Techniques", Second Edition, Tata McGraw-Hill, 2003.
        4. Henk Alblas and Albert Nymeyer, "Practice and Principles of Compiler Building with C", PHI, 2001.
        5. Kenneth C. Louden, "Compiler Construction: Principles and Practice", Thompson Learning, 2003

SOFTWARE DEVELOPMENT LAB

Contact Hours per week: 5hrs   **Subject Code: P1CSC3P1**

Contact Hours per Semester: 65 hrs

Credit: 3

Objective:

        This subject enables students to understand Project Life Cycle Phases Systematically in practical oriented problems by demonstrating various Desktop Applications and Windows Applications

Apply the following to the given application problems:

1. Project Planning
2. Software Requirement Analysis
3. Software Estimation
4. Software Design
5. Data Modeling & Implementation
6. Software Testing
7. Software Debugging

Desktop Based Projects:

        1. Library System
        2. Student Marks Analyzing System
        3. Text Editor.
        4. Create a dictionary.
        5. Telephone dictionary.
        6. Inventory System.

Web Based Projects:

1. Online Ticket Booking
2. Online Banking
3. Online Business
4. College Website
5. Online Library
6. Online Consultancy

OPEN SOURCE PROGRAMMING

Contact Hours per week: 5hrs   **Subject Code: P1CSC3P2**

Contact Hours per Semester: 65 hrs

Credit: 3

Objective:

- To Demonstrate how to use the following Shell commands
- To learn tracing mechanisms, user variables, Shellvariables, read-only variables, positional parameters, reading input to Shell script, command substitution, comments, and exportingvariables.
- To Write moderately complex Shell scripts

Lab List:

1. Write a menu- driven program for the following options
     i. List of files
     ii. Processes of Users
     iii. Today's Date
     iv. Quit out of Unix
2. Write a shell program which accepts the name of a file from the standard input and then performs the following test on it.
     i. File Existence
     ii. File Readable and Writable
3. Login as root and create groups as dba with id 501 & stud with id 555. Create the following list of users

User name	UID	GID	Working Shell	Secondary	Comments Group
Mac1	501	501	Bourne shell	555	Mac1 user
Mac2	502	501	C shell	NULL	Mac2 user
Mac3	503	501	BASH Shell	555	Mac3 user
User1	504	555	Bourne shell	NULL	User1 user
User2	505	555	BASH Shell	NULL	User2 user
Shut	--	--	--	NULL	Shutdown the system using the user id shut

   a. Examine the content of the /etc/passwd file.
   b. Examine the content of the /etc/shadow file. Name the text that is found in the second field for the users created.
   c. Set password for the users mac1, mac2, mac3 & shut.
   d. Select user2 from the list of users. Change the passwd aging information for user2 so that it matches the following information.
   e. Max inactive 2 days
   f. Expiry 4 days
   g. Now change the system date increase by 5 days
   h. Logout of login session. Attempt to log as user2. What happens?
   i. Change the shell for the user2 to Bourne shell.
   j. Delete user2 including his home directory and his comments.

     k.   Lock the user1 with the help of a single command.
4. Write a shell program to search for a given number from the list of numbers provided using binary search method
5. Write a shell program to find the position of substring in given string
6. Write a shell program to find the gcd for the 2 given numbers
7. Write a shell program to check whether a given string is palindrome or not.
8. Write a shell program to find the sum of the series sum=1+1/2+…+1/n
9. Write a shell program to count number of words, characters, white spaces and special symbols in a given text
10. Write a shell script to sort the given numbers in descending order using Bubble sort
11. Shell script to find occurrence of particular digit in inputted number
12. Write a program to generate fibonacci series for a given limit
13. Write a program to check whether the given number is prime or not.
14. Create an associative array with book details and dispaly it in a table.
15. Create a form with one text field and submit buttons for string length,string reverse,uppercase,lowercase,string replace . Display the result according to it.
16. Create a registration form which contains fields name,Roll No,Gender and a submit button All the details should be displayed in the server page when the user clicks the submit button.

WIRELESS COMMUNICATION

Contact Hours per week: 5hrs   **Subject Code: P1CSE31**
Contact Hours per Semester: 65 hrs
Credit: 5
Objective:
- To introduce the concepts of wireless / mobile communication using cellular environment.
- To make the students to know about the various modulation techniques, propagation methods, coding and multi access techniques used in the mobile communication.
- Various wireless network systems and standards are to be introduced.

UNIT I   **(13 hours)**
     Applications and reqirements of wireless services - History - types of services - requirements of services.Technical challenges of wireless communication - multipath propagation - spectrum limitations. Noise and interference limited systems - Introduction - noise lmited systems - interference limited systems

UNIT II   **(13 hours)**
     Propagation mechanisms - free space attenuation - reflection and transmission - diffraction - scattering by rough surfaces – waveguiding. Channel models - narrowband models - wideband models - directional models - determinisic channel modeling methods. Antennas - antennas for mobile stations - antennas for base stations

UNIT III   **(13 hours)**
     Structure of wireless communication link - transceiver block structure - simplified models. Modulation formats - basics - important modulation formats. Demodulation - demodulator structure and error probability in additive white gaussian noise channels - error probability in flat fading channels - error probability in delay and frequency dispersive fading channels

UNIT IV (13 hours)

Diversity - Introduction - microdiversity - macrodiversity and simulcast - combination of signals Speech coding - Introduction - sound of speech - stochastic models for speech - quantization and coding Equalizers - Introduction - linear equalizers - decision feedback equalizers

UNIT V (13 hours)

Multiple access and cellular principle - frequency division multiple access - time division multiple access - packet radio - duplexing - principles of cellular networks. Spread spectrum systems - frequency hopping multiple access - code division multiple access - cellular code division multiple access systems. Orthogonal frequency division multiplexing - Principle of Orthogonal frequency division multiplexing - implementation of transcievers - frequency selective channels. GSM - Global system for mobile communication - system overview - air interface - logical and physical channels - synchronization - coding - equalizer - circuit switched data transmission - stablishing a connection and handover - services and billing

Text book:

Andreas.F. Molisch, "Wireless Communications", John Wiley – India, 2006
> Unit I   : Chapter 1.1 to 1.3, 2.1, 2.2, 3
> Unit II   : Chapter 4.1 to 4.5, 7.2 to 7.5, 9
> Unit III : Chapter 10, 11.2, 11.3, 12
> Unit IV : Chapter 13.1 to 13.4, 15.1 to 15.4, 16.1 to 16.3
> Unit V   : Chapter 17.1 to 17.6, 18.1 to 18.3, 19.2 to 19.4, 24.2 to 24.10

Reference book:

1. Rappaport. T.S., "Wireless communications", Pearson Education, 2003.
2. Gordon L. Stuber, "Principles of Mobile Communication", Springer International Ltd.,2001.

OPERATING SYSTEM DESIGN

Contact Hours per week: 5hrs   **Subject Code: P1CSE31**
Contact Hours per Semester: 65 hrs
Credit: 5
Objective:

- To understand the concepts, structure and mechanism of operating systems.
- To understand the design principles and implementation of windows vista operating system

UNIT I (13 hours)

Computer system overview – basic elements - processor registers – instruction execution – interrupts – memory hierarchy – cache memory – I/O communication techniques. Operating system overview – operating system objectives and functions – evolution of operating systems – major acievements – developments leading to modern operating systems – microsoft windows overview

UNIT II (13 hours)

Process description and control – what is a process? – process states – process description – process control – execution of operating system – security issues. Threads, SMP, Microkernels – processes and threads – symmetric multiprocessing – microkernels – windows vista thread and SMP management. Concurrency: Mutual exclusion and Synchronization - Principles of concurrency – mutual exclusion:hardware support – semaphores – monitors – message passing – reader/writer problem

UNIT III (13 hours)

Concurrency:Deadlock and Starvation – principles of deadlock – deadlock prevention – deadlock avoidance – deadlock detection – an integrated deadlock strategy – dining philosophers problem – windows vista concurrency mechanisms. Memory management – memory management requirements – memory partitioning – paging – segmentation – security issues. Virtual memory – hardware and control structures – operating system software – windows vista memory management

UNIT IV   (13 hours)

Uniprocessor scheduling – types of scheduling – scheduling algorithms. Multiprocessor and Real time scheduling – multiprocessor scheduling – real time scheduling – windows vista scheduling

UNIT V   (13 hours)

I/O management and Disk scheduling – I/O devices – organization of I/O function – operating system design issues – I/O buffering – disk scheduling – RAID – disk cache – windows vista I/O. File management – overview – file organization and access – file directories – file sharing – record blocking –secondary storage management – file system security – windows vista file system

Text book:

William Stallings "Operating Systems - Internals and Design Principles", Sixth Edition, Pearson Education Ltd

UNIT I : Chapter 1.1 to 1.7, 2.1 to 2.5
UNIT II   : Chapter 3.1 to 3.6, 4.1 to 4.4, 5.1 to 5.6
UNIT III   : Chapter 6.1 to 6.6, 6.10, 7.1 to 7.5, 8.1, 8.2, 8.5
UNIT IV   : Chapter 9.1, 9.2, 10.1, 10.2, 10.5
UNIT V   : Chapter 11.1 to 11.7, 11.10, 12.1 to 12.7, 12.10

Reference book:

Charles crowley, "Operating system – A design oriented approach"

SOFT COMPUTING

Contact Hours per week: 5hrs   **Subject Code: P1CSC41**
Contact Hours per Semester: 65 hrs
Credit: 4
Objective:

Soft Computing refers to a collection of computational techniques in computer science, artificial intelligence, machine learning which attempt to study model and analyze very complex phenomena.

UNIT I   (13 hours)

Introduction - Neural Networks – Application scope of Neural Networks – Fuzzy logic – Genetic Algorithm – Hybrid Systems – Soft Computing. Artificial Neural Network – An Introduction – Fundamental Concept – Evolution of Neural Networks – Basic models of Artificial Neural Network – Important terminologies of ANNs – McCulloch-Pitts Neuron – Linear Separability – Hebb Network.

UNIT II   (13 hours)

Supervised Learning Network – Introduction – Perceptron Networks – Adaptive Linear Neuron – Multiple Adaptive Linear Neurons – Back Propagation Network.

UNIT III   (13 hours)

Introduction to classical sets and Fuzzy Sets – Introduction – Classical sets (Crisp Sets) – Fuzzy Sets – Classical Relations and Fuzzy Relations – Introduction – Cartesian Product of Relation – Classical Relation – Fuzzy Relation.

UNIT IV   (13 hours)

Genetic Algorithm – Introduction – Basic Operators and Terminologies in Genetic Algorithms – Traditional Algorithm Vs Genetic Algorithm – Simple Genetic Algorithm – General Genetic Algorithm – The Schema Theorem – Classification of Genetic Algorithm - Holland Classifier Systems – Genetic Programming – Applications of Genetic Algorithm.

UNIT V   (13 hours)

Application of Soft Computing – Introduction – A fusion Approach of Multispectral Images with SAR (Synthetic Aperture Radar) Image for Flood Area Analysis – Optimization of Traveling Salesman Problem using Genetic Algorithm Approach – Genetic Algorithm based Internet Search Technique

Text book:

"Principles of Soft Computing "by S.N.Sivanadam & S.N.Deepa. First Edition , Wiley India Edition.

UNIT I : Chapter 1, 2
UNIT II   : Chapter 3
UNIT III   : Chapter 7, 8
UNIT IV   : Chapter 15
UNIT V   : Chapter 16

Reference Book:

"Soft Computing and Its Applications " by R A Aliev & R R Aliev. Second Edition

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Data Mining & Warehousing

Contact Hours per week: 5hrs   **Subject Code: P1CSC42**
Contact Hours per Semester: 65 hrs
Credit: 4

Objective:

Data mining and warehousing are recent technologies that enable the discovery of interesting patterns from large collection of data. Data mining emphasizes human understandability of discovered patterns and scalability of its techniques to huge stores of data such as the World Wide Web

Unit I   **(13 hours)**

Introduction – Motivation – Data Warehousing and Data Mining Technologies – Data Models – Data Warehousing and OLAP: Users Perspective – Data Mining: Users Perspective – Related Disciplines – Other Issues – Future Trends.

Unit II   **(13 hours)**

Frequent Pattern Mining – Basic Problem Definition – Mining Association Rules – Applications – Variations – Interestingness – Frequent Itemset Mining (FIM) Algorithms – Current status of FIM Algorithm Comparison – Optimal FIM Algorithms – Incremental Mining – Conciseness of Results – Sequential Rules.

Classification – Basic Problem Definition – Applications – Evaluation of Classifiers – Other Issues – Classification Techniques – Optimal Classification Algorithm – Regression.

Unit III   **(13 hours)**

Clustering – Basic Problem Definition – Clustering: Applications – Measurement of similarity – Evaluation of Clustering Algorithms – Classification of Clustering Algorithms – Partitioning Methods – Hierarchical Methods – Density- Based Methods – Grid – Based Methods – Outlier Detection.

Pattern Discovery in Real World Data – Relational Data – Transactional Data – Multi-Dimensional Data – Distributed Data – Spatial Data – Data Streams – Time-Series Data – Text and Web Data – Multimedia Data

Unit IV   **(13 hours)**

Data Warehousing: The Data Model – Fundamentals – Data Warehouse Data characteristics – Data Warehouse Components – Approaches to Build Data marts and Data Warehouse – ETL – Logical Data Modeling – Schemas Design in Dimensional Modeling –OLAP – Storage and Chunks.

Unit V   **(13 hours)**

Data Warehousing: Query Processing – Materialized views – Materialized Views Selection – Materialized Views Maintenance and Consistency – Indexing – General Query Evaluation.

Case Studies – Study 1: Telecom content Warehouse – Study 2: OLAP for the Fast Food Industry – Study 3: Prototype Credit Data Mart for Bank – Study 4: Churn Modeling for a Bank – Study 5: Intrusion Detection using kNN Classification

Text book:

"Data Mining "by Vikram Pudi & P.Radhakrishna Oxford University Press

Reference Book:

"Data Mining Concepts and Techniques "by Jiawei Han, Micheline Kamber & Jian pei Third Edition Morgan Kaufmann Publishers

Unit I   : Chapter 1
Unit II : Chapter 2, 3
Unit III : Chapter 4, 5
Unit IV : Chapter 6
Unit V : Chapter 7, 8

Elective – 3 Project & Viva-Voce

Contact Hours: 20   Subject Code: P1CS4PV
Contact Hours Per semester: 300

- **Students have to submit their Project title and Abstract at the end of III-Semester.**

Project Evaluation

Start-up Review

Students have to present their Title of the project, Abstract and Module Description. The Proposed system should be specified.

Design Review

Students have to present their Data Flow Diagram, Database Design (ER, UML) and Screen Design.

Implementation and Validation Review

Students have to present their testing and Screenshots

Final Review

Students have to compile, run their project and explain it Future Enhancements.

- **Students have to submit their project report on First week of April.**

Course Name: **Bachelor of Science**
Discipline: **Information Technology.**
COURSE SCHEME:

Semester	Part	Subject	Hour	Credit	Int+Ext=Total	Subject Code	Revision
III	Part I	Tamil/ Hindi	6	3	25+75=100	U1PT31/ U1PH31	Revised
	Part II	English	6	3	25+75=100	U1PE31	Revised
	Core 7	Data Structures	5	4	25+75=100	U1NTC31	Revised
	Core 8	Object Oriented Programming With C++	4	4	25+75=100	U1NTC32	Revised
	Allied 3	Management Information System	4	4	25+75=100	U1NTA31	New
	Core -9 - Lab	Programming in C++ Lab	5	3	40+60=100	U1NTC3P1	Revised

Semester	Part	Subject	Hour	Credit	Int+Ext=Total	Subject Code	Revision
IV	Part I	Tamil/ Hindi	6	3	25+75=100	U1PT41/ U1PH41	Revised
	Part II	English	6	3	25+75=100	U1PE41	Revised
	Core 10	Database Management Systems	5	4	25+75=100	U1NTC41	Revised
	Core 11	Operating Systems	4	4	25+75=100	U1NTC42	Revised
	Allied 4	Resource Management Systems	4	4	25+75=100	U1MAA4N	No Change
	Core -12 Lab	Client Server Lab	5	3	40+60=100	U1NTC4P1	New

Semester III
CORE 7 - DATA STRUCTURES

Contact Hours per week: 5hrs   Subject Code: U1NTC31
Contact Hours per Semester: 65 hrs   Credit: 4
Objective:
1. Assess how the choice of data structures and algorithm design methods impacts the performance of programs.

VIRUDHUNAGAR HINDU NADARS' SENTHIKUMARA NADAR COLLEGE

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2. Choose the appropriate data structure and algorithm design method for a specified application.
3. Solve problems using data structures such as linked lists, stacks, queues, binary trees and graphs and writing programs for these solutions.

UNIT I: **(11 HRS)**

Introduction to Data structures: Overview – Need for data structures – Definitions – Data structures. Algorithm analysis: Introduction – Problem solving – Modular design – Implementation of algorithms. Arrays: Introduction – Range of an array – Primitive operations – Element access in array – Addressing functions – One dimensional array – Two dimensional array – Multi dimensional array – Matrices

UNIT II: **(15 HRS)**

Linked lists: Introduction – Memory allocation – Benefits – Limitations – Types – Basic operations – Single linked list – Simple algorithm on linked lists – Circular linked lists – Double linked list – Circular double linked lists – Sparse matrix representation – Polynomial representation – Polynomial addition. Stack: Introduction – ADT stack – Implementation of stack – Applications of stack

UNIT III: **(14 HRS)**

Queues: Introduction – Implementation of queues – Array based implementation – Linked lists based implementation – Circular queues – Dequeue. Trees: Introduction – Binary trees – Binary tree representation – Binary tree traversals – Recursive procedures – Expression trees

UNIT IV: **(15 HRS)**

Binary search trees: Introduction – Creating Binary search tree (BST) – Inserting into BST – Searching in BST – Ordered output in BST – Deletion in BST. Sorting: Introduction – Bubble sort – Insertion sort – Selection sort – Merge sort – Quick sort

UNIT V: **(10 HRS)**

Graphs: Introduction – Adjacency matrix representation – Adjacency list representation – Breadth first search (BFS) – Depth first search (DFS) – Dijkstra's algorithm

Text book:

"Data structures" Chitra, P.T.Rajan, Vijay Nichole imprints private Ltd.

        Unit I   : Chapter 1, 2, 3
        Unit II : Chapter 4, 5
        Unit III : Chapter 6, 7
        Unit IV : Chapter 8, 11
        Unit V : Chapter 12

Reference book:

1. "Schaum's Outline of Data Structures" Seymour Lipschutz, Mcgraw hill Ltd
2. "Classic Data structures" D.Samanta, Prentice Hall India Ltd

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CORE 8 - OBJECT ORIENTED PROGRAMMING WITH C++

Contact Hours per week: 4 hrs   Subject code: U1NTC32

Contact Hours per semester: 52 hrs   Credit: 4

Objective:

1. Understanding the Concepts of object-oriented Programming Language.
2. Solve problems using OOPs Concepts such as Class, Object, Inheritance, and Polymorphism for these solutions.

Unit I: **(12 hrs)**

       Principles of object oriented programming - Basic concepts of object oriented programming - Benefits of OOP

       Beginning with C++ - What is C++ - Applications of C++ - A simple C++ program - C++ statements - An example with class - Structure of C++ program - Creating a source file - Compiling and linking

       Tokens, expressions and control structures - Tokens - Keywords - Identifiers and constants - Basic data types - User defined data types - Derived data types - Symbolic constants - Type

compatibility - Declaration of variables - Dynamic initialization of variables - Reference variables - Operators in C++ - Scope resolution operator - Member dereferencing operator - Member management operator - Manipulators - Type cast operators - Expressions and their types - Special assignment expressions - Implicit conversions - Operator overloading - Operator precedence - Control structures

Unit II **(10 hrs)**

Functions in C++ - Main function - Function prototyping - Call by reference - Return by reference - Inline functions - Default arguments - const arguments - Function overloading - Friend and virtual function

Classes and objects - Specifying a class - Defining member functions - C++ program with a class - Making an outside function inline - Nesting of member functions - Private member functions - Arrays within a class - Memory allocation for objects - Static data members - Static member functions - Arrays of objects - Objects as function arguments - Friendly functions - Returning objects - const member functions - Pointers to members - Local classes

Unit III **(10 hrs)**

Constructors - Parameterized constructors - Multiple constructors in a class - Constructors with default arguments - Dynamic initialization of objects - Copy constructor - Dynamic constructor

Operator overloading and type conversions - Defining operator overloading - Overloading unary operator - Overloading binary operator - Overloading binary operator using friends - Manipulation of string using operators - Type conversions

Manipulating strings - Creating string objects - Manipulating string objects - Relational operations - String characteristics - Accessing characters in string - Comparing and swapping

Unit IV **(10 hrs)**

Inheritance: Extending classes - Defining derived classes - Single inheritance - Making private member inheritable - Multilevel inheritance - Multiple inheritance - Hierarchical inheritance - Hybrid inheritance - Virtual base classes - Abstract classes - Constructors in derived classes - Member classes: Nesting of classes

Pointers, Virtual functions, Polymorphism - Pointers - Pointers to objects - this pointer - Pointers to derived classes - Virtual functions - Pure virtual functions

Unit V **(10 hrs)**

Managing console I/O operations - C++ streams - C++ stream classes - Unformatted I/O operations - Formatted console I/O operations - Managing output with manipulators

Working with files - Classes for file stream operations - Opening and closing a file - Detecting end of file - More about open(): File modes - File pointers and their manipulations - Sequential input and output operations - Updating file: Random access - Error handling during file operations - Command line arguments

Text book:

Object oriented programming C++, Third Edition, E.Balagurusamy

Unit I   : Chapter 1.5, 1.6, 2, 3
Unit II   : Chapter 4.2 to 4.10, 5
Unit III   : Chapter 6, 7, 15
Unit IV   : Chapter 8, 9
Unit V   : Chapter 10, 11

Reference book:

- D. Ravichandran , Programming with C++, Second Edition Tata McGraw-Hill Publishing Company Limited.
- www.cplusplus.com
- Schaum's Outline of Programming with C++, John Hubbard, McGraw Hill Professional

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ALLIED 3 - MANAGEMENT INFORMATION SYSTEM

Contact Hours per week : 4 hrs   Subject code : U1NTA31
Contact Hours per semester : 52 hrs
Credit: 4

Objective:
        The revolution in business caused by the internet and its related technologies demonstrates that information systems and information technology are essential for success of today's business enterprise. Students should learn how to use and manage a variety of information technology to revitalize business process, improve managerial decision making and gain competitive advantage

UNIT – I   **13 Hrs**
        Introduction to Management Information System – Evolution of MIS – Need of MIS – Definition of MIS – Benefits of MIS – MIS Functions – Objective of MIS -Characteristics of MIS – Role of MIS – Information Flow in a Typical Manufacturing Company - Operating Elements of an Information system - Components of Information Systems – Three Dimensions of Information Systems – Management Information System means Computer? - Various Steps to be followed for conversion of Manual to Computer Based Information system – Database as a feature of MIS - The relationship between Decision-making and MIS- Management Misinformation systems - The logic of Management Information System -Integrating Managerial levels and Functional Areas by MIS - Major MIS Elements – Technology of MIS – Data Life cycle. Information Generators – Information System Levels – Horizontal and vertical Integration of an Information System – Framework Delineated by Robert Anthony – Feed back and control - Open and closed loop systems – MIS Organization – Five Types of Information system - Supports of Information Systems – Domains of MIS Types – Database Processing – MIS Vs Data Processing - MIS as a Federation of Subsystems – Synthesis of a Management Information Structure – MIS as a pyramid - Establishing an MIS - Working Smarter.

UNIT – II   **13 Hrs**
        Difference between TPS and MIS - How MIS works? – what is an Exception Report – Computer Information Systems – MIS and Information Resources Management – Concepts, Feature and Ingredients of IRM - MIS Vs IRM - Resistance to MIS - Implementing an MIS – Managing Information Systems and Organizational Chart – Modules of MIS – MIS Tools and selection – Basic conceptual Framework in area of MIS - Nolan's Stage Hypothesis - Dickson's systems Hierarchy. Data and Information – Data Processing - Data Processing Vs Information Processing - Management of Information - Nature of Information - Manager and Information – Use of Data - Data Representation – Master file and Transaction file - MIS Vs Data Processing. Characteristic of Information - Evaluating Information – Using Information Management in Control - Information's systems - Managers at different level of the organization have different Information needs - Sources of Information - Various functions of Management - Competitors activities as an important source of Information - Various needs of Different Managerial levels translated into an MIS - Difference between Planning and control Information - Determinants of value of Information – Information systems by organizing level - Five components of Information system - Personal Information system Components - Workgroup Information system Components - Organizational Information system Components - Hierarchy of Management activity - Formal Vs Informal Information System - Management Information support for Decision making   - Information System and Decision making - Structured, Programmable Decisions - Unstructured Non Programmable Decisions - Data bank/ Bases - Uses of Information - Relationship between data - Information and Control - Criteria of usefulness of Information - Decision Analysis Method for Information Requirements.

UNIT –III   **8 Hrs**
        Quality Information – Building Blocks for the Information System – Information System Concepts -   Feedback and control – Other System Characteristics - Systems Classification – Difference between Organizational System and MIS – Strategic Information Systems – Adaptive

system - Business as a System – Business Systems Planning - Business as an Information System - Business Goals and Objectives - Principal Functional Systems in a business – Product flow and Information Flows – Principal Documents Associated with Information flow – Information and the organization – Operation workers – Information workers – Information sources – Information System - Business function Information System.

UNIT – IV   **10 Hrs**

        Introduction - Symbols used in system architecture diagram - Types of TPS – Online TPS - Batch Transaction Processing - Architecture of Batch Transaction Processing – Operating Elements of Information system - Time Sharing – End-user Computing – Term End user Computing and Why it has Arisen - Components of an End-user Computing System – Four major Categories of End-user Computing Applications – Information centre - Types of TPS - Decision Support System – Definition of DSS - Understanding of DSS - Architecture of a DSS – Characteristics of DSS – Components of DSS – Structure of DSS – Fundamental DSS program Structure - Conceptual model of a DSS – Limitation of DSS – DSS users - Capabilities of DSS - Major Functions of DSS Applications – Task Environment – A Group Decision Support System and its Components of GDSS – Constructing DSS with a DSS Generator - DSS Generator - DSS tools - DSS software's - Resource pooling - Synergy - Group Decision- making.

UNIT – V   **8 Hrs**

        Knowledge system - Types of knowledge system - Expert System - Expert system and Management science (MS) - Difference between Expert systems and DSS - How DSS and ES Differ from Conventional Management System - Artificial Intelligence - Turing Test - Areas of Artificial Intelligence - Neural Network in Business : Artificial Intelligence's New paradigm - Some of the Task Domains of Artificial Intelligence.

Text Book:

        Management Information Systems Text and Applications by C.S.V Murthy Himalaya Publishing House, II Edition

                Unit-1 - Chapter 1 & 2

                Unit 2 - Chapter 3 & 4

                Unit 3 - Chapter 5

                Unit 4 - Chapter 11 & 12

                Unit 5 - Chapter 15

Reference book:

        Management Information system by James A. O'Brien Galgotia Publications pvt Ltd, IV Edition

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CORE 9 - PROGRAMMING WITH C++ LAB

Contact Hours per week: 5 hrs   Subject code: U1NTC3P1

Contact Hours per semester: 52 hrs

Credit: 3

Objective:

        To enhance the Students knowledge to solve problems using OOPs Concepts such as Class, Object, Inheritance, and Polymorphism for these solutions

1. Write a C++ Program to find the simple interest.
2. Write a C++ Program to find greatest in 3 numbers using If Condition
   Write a C++ Program to find whether given no is a prime no or not.
3. Write a C++ Program to sum of digit using Loop Statements
4. Write a C++ Program to use switch statement. Display Monday to Sunday.
5. Write a C++ Program to reverse a number using pointer.
6. Write a C++ Program to find the maximum number in array using pointer.
7. Write a C++ Program to find whether a string is palindrome or not.
8. Write a C++ Program to String Handling functions.
9. Write a C++ Program to Calculate arithmetic operation using object.

10. Write a C++ Program to Factorial of given number using function
11. Write a C++ Program to Prepare Student Mark sheet using method overloading
12. Write a C++ Program to Payroll Calculation using Multiple Inheritance
13. Write a C++ Program to find sum of two matrices.
14. Write a C++ Program to generate Armstrong Number using recursive function
15. Write a C++ Program to generate Adam Number using Constructor
16. Write a C++ Program to find Perfect numbers using Friend function
17. Write a C++ program to calculate E.B. Bill calculation using Structure.
18. Write a C++ program to calculate library detail using Union
19. Write a C++ program to show the Operator Overloading method.
20. Write a C++ Program to show Exception Handling
21. Write a C++ program to write and read a file.

SEMESTER IV
CORE 10 - DATABASE MANAGEMENT SYSTEMS

Contact Hours per Week: 5 hrs   Subject code: U1NTC41
Contact Hours per Semester: 65 hrs
Credit: 4

Objective:

The objective of this subject is to make the student to understand database management system over the demerits of file organizations and file structure system. This subject also aims to understand the RDBMS concepts with database architecture, data modelling- E-R modeling, data normalization, relational algebra and relational calculus and finally this subject emphasizes SQL, table, views, queries and functions.

UNIT I   **(12 hrs)**

Introduction to Database Management Systems(DBMS): Introduction-why a database-characteristics of data in a database-database management system-transaction management-concurrency control-recovery management- security management-language interface-storage management-data catalog management- why DBMS- types of Database Management Systems-hierarchical model-advantages-disadvantages-network model-advantages-disadvantages-relational model-advantages-disadvantages-Object-Oriented Model-advantages-disadvantages-Object-Relational Model-deductive/inference model-comparison between the various database models. Files, File organization and File structures: Introduction - operations of files - file storage organization-sequential file organization- sequential file processing - case study-efficiency of sequential file organization- advantages and disadvantages- direct file organization-direct file processing-case study-relative addressing-hashing-indexing-advantages and disadvantages-storage media-magnetic tape-tape as primary storage-tape as backup-magnetic disk-file organization-file volatility-file activity-file query-file size-data currency-file structure-record types-fixed length records-variable-length records-records having variable length fields-records having repeating fields-records having optional fields-file containing records of different record types-implementation of variable-length records.

UNIT II   **(12 hrs)**

Introduction to Relational Database Management Systems(RDBMS): Introduction-RDBMS terminology-the relational data structure-relational data integrity-domain constraints-entity integrity-referential integrity-operational constraints -relational data manipulation-Codd's rules-information rule-guaranteed access rule-systematic treatment of nulls rule-active on-line catalog based on the relational model-comprehensive data sub-language rule-view updating rule-high-level insert, update and delete- physical data independence-logical data independence-integrity independence-distribution independence-non-subversion rule. Database architecture and data modeling: Introduction-conceptual,physical and logical database models-external or logical level-conceptual level-physical level-database design-requirements analysis-information modeling-design constraints-structural constraints-type constraints-range constraints-relationship constraints-temporal constraints-functional dependencies. Entity-Relationship (E-R) Modeling: Introduction-E-R model-components of an E-R

model-entities-attributes-simple attribute-composite attribute-single-valued attribute-multi-valued attribute-derived attribute-E-R diagram conventions-relationships-degree-connectivity-cardinality-dependency-participation-composite entities-entity list-E-R diagrams (ERDs)-E-R modeling symbols

UNIT III   (12 hrs)

Data Normalization: Introduction - keys-relationships-First Normal Form(1NF) - Second Normal Form(2NF)-Third Normal Form(3NF)-Boyce-Codd Normal Form(BCNF)-Fourth Normal Form(4NF)-Fifth Normal Form(5NF)-Domain-key Normal Form(DKNF)-Denormalization. Relational Algebra and Relational Calculus: Relational algebra-relational algebraic operations-UNION, INTERSECTION and DIFFERENCE, CARTESIAN PRODUCT, SELECT, PROJECT, RENAME, JOIN, DIVISION-relational calculus-tuple relational calculus-expressions and formulas-existential and universal quantifiers-domain relational calculus.

UNIT IV   (14 hrs)

Introduction to Structured Query Language(SQL): Introduction - History of SQL - Characteristics of SQL-Advantages of SQL- SQL in action-SQL data types and literals- SQL data types: CHARACTER(n)-CHARACTER VARYING(n)- BIT(n) and BIT VARYING(n) - NUMERIC(p,q)-DECIMAL(p,q)-INTEGER-SMALLINT-FLOAT(p)-Literals-character string-bit string-exact numeric-approximate numeric-string data types-types of SQL commands-DDL-DML-DQL-DCL-DAS-TCS-Sql operators-arithmetic operators-comparison operators-relational operators - row comparison-IS [NOT] NULL-ANY,ALL and SOME-[NOT] EXISTS-[NOT] LIKE-ESCAPE clause-[NOT] IN- {NOT} BETWEEN-logical operators-set operators-operator precedence. Tables, views and indexes: tables-creating a table-modifying table-deleting a table-views-creating a view-data query and manipulation operations with views-the CHECK OPTION-views involving multiple tables-updateable and non-updateable views-advantages of views-using views-dropping a view-indexes - book index Vs table index-why use an index?-creating an index-types of indexes-composite indexes-unique indexes-clustered indexes-dropping an index-using indexes.

UNIT V   (15 hrs)

Queries and Subqueries: Queries-selecting all columns(SELECT *)-qualified retrieval-eliminating duplicates – select using DISTINCT-select using IN –select using BETWEEN-select using LIKE-ESCAPE clause-selecting computed values-selection involving NULLs-grouping while selecting-ordering while selecting-AND,OR and NOT-subqueries-what is a subquery?- execution of a subquery-nested subqueries-parallel subqueries-correlated subquery. Aggregate functions: Introduction-general rules-COUNT() and COUNT(*)-SUM()-AVG()-MAX() and MIN(). Insert, update and delete operations: Introduction-INSERT statement-single row INSERT-bulk inserts of data-UPDATE statement-DELETE statement.

Text Book

1. Alexis Leon & Mathews Leon , "Data base Management System" , Leon Vikas Publishing Chennai , 2002

UNIT I : Chapters : 5, 3
UNIT II : Chapters : 7, 8, 9
UNIT III: Chapters : 11, 12
UNIT IV: Chapters: 14 , 15
UNIT V: Chapters 17, 18, 19

Reference Books

1. Raghu Ramakrishnan & Johannes Gehrke, "Database management Systems", 2nd Edition, McGraw Hill International Edition, 2000
2. Silberschatz , Korth, Sudarshan, "Database system concepts" , 4th edition, McGraw Hill International Edition.

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CORE 11 - OPERATING SYSTEMS

Contact Hours per week: 4hrs
Contact Hours per Semester: 52 hrs   Subject Code: U1NTC42
Credit: 4

Objective:
The students should have acquired the following capabilities:
1. To acquire the knowledge on the role of an operating system.
2. Become aware of the issues in the management of resources like processor, memory and input-output.

UNIT I   **(10 hrs)**

Introduction - What is an Operating System? – Mainframe Systems-Desktop Systems-Multiprocessor Systems-Distributed Systems-Real Time Systems-Computing Environment. Computer System Structures - Computer System Operation- I/O structure-Storage Structure- Storage Hierarchy –Hardware Protection-Network Structure. Operating System Structure - System Components-Operating-System Services - System Calls - System Programs -System Structure- Virtual Machines-System Design and Implementation - Operating System Generation

UNIT II   **(10 hrs)**

Process - Process Concept - Process Scheduling   - Operations on Processes - Co operating processes- Interprocess Communication - Communication in Client Server Systems. Threads: Overview- Multithreading Models- Threading Issues. CPU Scheduling - Basic Concepts- Scheduling Criteria- Scheduling Algorithms- Multiple-Processor Scheduling- Real Time Scheduling- Algorithm Evaluation- Process Scheduling Models

UNIT III   **(10 hrs)**

Process Synchronization - Background - The Critical-Section Problem- Synchronization Hardware - Semaphores - Classic Problems of Synchronization - Critical regions - Monitors -OS Synchronization- Atomic Transactions. Deadlocks - System Model- Deadlock Characterization- Methods for Handling Deadlocks- Deadlock Prevention- Deadlock Avoidance- Deadlock Detection- Recovery From Deadlock

UNIT IV   **(12 hrs)**

Memory Management - Background -Swapping- Contiguous Memory Allocation- Paging- Segmentation- Segmentation with paging
Virtual Memory - Background   - Demand Paging - Process Creation- Page Replacement - Allocation of Frames   - Thrashing

UNIT V   **(10 hrs)**

File-System Interface - File Concept   - Access Methods - Directory Structure - File-System Mounting - File Sharing- Protection
File-System Implementation - File-System Structure - File-System Implementation   - Directory Implementation   - Allocation Methods - Free-Space Management - Efficiency and Performance - Recovery

Text book:
"Operating System Concepts" Sixth Edition Silberschatz, Galvin, Gagne, Wiley India Edition.
Unit I   : Chapter 1, 2, 3
Unit II : Chapter 4, 5, 6
Unit III : Chapter 7, 8
Unit IV : Chapter 9, 10
Unit V : Chapter 11, 12

Reference book:
"Operating systems", Second Edition, William stallings, PHI Learning
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ALLIED 4 - RESOURCE MANAGEMENT SYSTEMS

Contact Hours per week: 4hrs
Contact Hours per Semester: 52 hrs   Subject Code: U1MAA4N
Credit: 4

Objective:

To provide the student with the concept of Operations Research Techniques and problem solving in LPP, Simplex Method, Assignment Problem and Transportation Problem.

UNIT I   **(10 hrs)**

Development of OR – Definition of OR – Modeling – Characteristics and Phases of OR – tools, techniques and Methods of OR – Scope of OR

UNIT II   **(10 hrs)**

Linear programming Problem: Formulation – Slack and Surplus Variables – Standard form of LPP – Graphical Representation of LPP

UNIT III   **(10 hrs)**

Simplex Method – Artificial Variable techniques: Big M method (Only Problems)

UNIT IV   **(10 hrs)**

Mathematical Formulation of AP – Algorithm: Hungarian Method – Balanced and Unbalanced AP

UNIT V   **(12 hrs)**

Mathematical Formulation of Transportation Problem – Initial basic feasible solution: North West Corner Method and Vogel's Approximation Method – Optimum Solution of TP using MODI Method

Text Book:

Operation Research, S.D.Sharma
UNIT I: Chapter 1 – 1.1, 1.2, 1.4, 1.8, 1.9, 1.10, 1.11
UNIT II: Chapter 3 – 3.2, 3.5, 3.6, 3.3
UNIT III: Chapter 5 – 5.3, 5.5.4
UNIT IV: Chapter 12 – 12.2, 12.4, 12.6
UNIT V: Chapter 11 – 11.2, 11.8, 11.10, 11.11, 11.12

Reference Book:

1. Kanthi Swarup at all, "Operations Research", Sultan Chand & Sons, New Delhi, 1996.
2. Handy S.Taha, Operations Research, TMH.

CORE 12 - CLIENT SERVER LAB

Contact Hours Per Week: 5hrs   Subject Code : U1NTC4P1
Contact Hours per Semester: 65hrs
Credit: 3

Objective:

To improve the Programming skills of the Students by implementing some simple programs including control arrays, text boxes, message boxes, dialog boxes, labels, controls, menus, picture boxes, pull-down menus, and combo boxes in windows environment and also using Database Connectivity.

1. Program to check whether the given number is
   a. Armstrong number or not
   b. Prime number or not
2. Program to perform the following string operations
   a. reverse the string
   b. find out the length of the string
   c. concatenating any two strings
   d. To copy and to compare a string
   e. To find a sub-string
3. Program to find

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  a. current date and time

  b. day of given date

4. Program to display Mark sheet for a student using Textbox and Buttons.
5. Program to find the Fibonacci series using Recursion
6. Program to do arithmetic operations using flex grid control
7. Program to draw geometric shapes
8. Program to design a digital clock
9. Develop a Objective type online test
10. Program to vary color Palette
11. Program to show picture animation
12. Program to create a file open dialogue to load a picture
13. Program to design an ordinary calculator
14. Design a notepad
15. Program to create a color mixture using Scroll bar control
16. Program to load pictures using Combo box
17. Program to calculate student fees using List and Combo box.
18. Program to design a sketch pad using Picture box
19. Student mark sheet processing system using Data control
20. Bank information system using Data control
21. Employee paybill Processing system using ADODC
22. EB bill preparation system using ADODC
23. Library management system using Data Report
24. Employee paybill Processing system using Data report

Course Name: **BACHELOR OF COMPUTER APPLICATIONS**

Semester	Part	Subject	Hour	Credit	Int+Ext = Total	Subject Code	Revision
III	Core 5	Java Programming	5	4	25+75=100	U1CAC31	Revised
	Core 6	Data Structure	4	4	25+75=100	U1CAC32	**Revised**
	Core 7	Computer Organization	4	4	25+75=100	U1CAC33	New
	Allied 3	Computer Based Financial Accounting	5	5	25+75=100	U1CEA3A	**Revised**
	Core 8 – Lab	Java Programming Lab	5	3	40+60=100	U1CAC3P1	**Revised**
	Core 9 – Lab	Data Structure Using C Lab	5	3	40+60=100	U1CAC3P2	New
	SBE – 3	Tally Lab	2	2	40+60=100	U1CAS3P1	New

Semester	Part	Subject	Hour	Credit	Int+Ext = Total	Subject Code	Revision
IV	Core 10	Database Management System	4	4	25+75=100	U1CAC41	**Revised**
	Core 11	Software Engineering	4	4	25+75=100	U1CAC42	**Revised**
	Core 12	Operating System	4	4	25+75=100	U1CAC43	**Revised**
	Allied 4	Principles of Costing	5	5	25+75=100	U1CEA4A	**Revised**
	Core 13 – Lab	Visual Programming Lab	6	3	40+60=100	U1CAC4P1	**Revised**
	Core 14 – Lab	DBMS Lab	5	3	40+60=100	U1CAC4P2	**Revised**
	SBE - 4	Introduction to Multimedia	2	2	25+75=100	U1CAS41	**Revised**

Core 5 Java Programming

Contact Hours per Week : 5 Hrs
Contact Hours per Semester : 60 Hrs

Credits : 4   **Subject Code : U1CAC31**

Objectives:
  ➢ To understand fundamentals of java programming such as variables, conditional and iterative execution, methods, etc.
  ➢ To understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
  ➢ Able to write GUI programs using AWT controls.

Unit I   **7 Hrs**
The Genesis of Java: Java's Lineage – The Creation of Java – Why Java is Important to the Internet – Java's Magic – The Java Buzzwords – The Continuing Revolution.
An Overview of Java: Object Oriented Programming – A First Simple Program – Two Control statements – Using Blocks of code – Lexical issues – The Java class libraries.
Data types, Variables and Arrays: Java is strongly typed language – The simple types – Integers – Floating point types – Characters – Booleans – A closer look at Literals – Variables – Type conversion and Casting – Automatic type promotion in expressions – Arrays – A few words about strings.

Unit II   **9 Hrs**
Operators: Arithmetic operators – The Bitwise operators – Relational Operators – Boolean logical operators – The Assignment operator – The ? operator – Operator precedence – Using parentheses.
Control Statements: Java's selection statements – Iteration statements – Jump statements.
Introducing Classes: Class fundamentals – Declaring Objects – Assigning Object reference variables – Introducing methods – Constructors – The this keyword – Garbage collection – The finalize( ) method.
A closer look at methods and classes: Overloading methods – Using object as parameters – A closer look at argument passing – Returning objects – Recursion – Introducing access control – Understanding static – Introducing final – Introducing nested and inner classes – Using command line arguments.

Unit III   **9 Hrs**
Inheritance: Inheritance basics – Using super – Creating multilevel hierarchy – When constructors are called – Method overriding – Dynamic method dispatch – Using abstract classes – Using final with inheritance – The Object class.
Packages and Interfaces: Packages – Access Protection – Importing packages – Interfaces.
Exception Handling: Exception handling fundamentals – Exception types – Uncaught exceptions – Using try and catch – Multiple catch clauses – Nested try statements – throw – throws – finally – Java's Built-in Exceptions – Creating your own Exception subclasses – Chained Exceptions – Using Exceptions.

Unit IV   **11 Hrs**
String Handling: The String constructors – String length – Special String operations – Character Extraction – String Comparison – Searching Strings – Modifying a String – Data Conversion using valueOf( ) – Changing the case of characters within a String – String Buffer.
Multithreaded programming: The Java Thread model – The Main Thread – Creating a Thread – Creating Multiple Threads – Using isAlive( ) and join( ) – Thread priorities –

Synchronization – Inter thread communication – Suspending, Resuming and Stopping Threads – Using Multithreading.

Input/Output: Exploring java.io: The java I/O classes and interfaces – File – The Stream classes – The Byte streams – The Character streams.

Unit V   **12 Hrs**

The Applet Class: Applet basics – Applet Architecture – An Applet skeleton – Simple Applet Display methods – Requesting Repainting – Using the status window – The HTML APPLET tag – Passing parameters to Applets – getDocumentBase( ) and getCodeBase( ) – AppletContext and showDocument( ) – The AudioClip Interface.

Event Handling: Two Event Handling Mechanisms – The Delegation Event Model – Event Classes – Sources of Events – Event Listener Interfaces – Using the Delegation Event Model – Adapter Classes – Inner Classes.

Using AWT controls, Layout Managers and Menus: Control fundamentals – Labels – Using Buttons – Applying Check Boxes – CheckboxGroup – Choice controls – Using Lists – Managing Scroll Bars – Using a TextField – Using a TextArea – Understanding Layout Managers – Menu Bars and Menus- Dialog Boxes – FileDialog – Handling Events by Extending AWT Components – Exploring the controls, menus and layout managers.

Text Book:

The Complete Reference Java2 by Herbert Schildt, Tata McGraw Hill edition, Fifth edition, 2008.

Unit I: Chapter 1, 2, 3
Unit II: Chapter 4, 5, 6, 7
Unit III: Chapter 8, 9, 10
Unit IV: Chapter 13, 11, 17
Unit V: Chapter 19, 20, 22

Reference Books:

1) Java 2 Programming Black book, Steven Holzner et al , Dreamtech press, 2008.
2) Object Oriented Programming With Java, Rajkumar Buyya, S.Thamarai Selvi, Xingchen Chu, Tata McGraw Hill, 2009.
3) Object Oriented Programming in Java, Dr. G.T. Thampi, DreamTech Press, 2009.

Core 6 - Data Structure

Contact Hours per Week: 4 Hrs
Contact Hours per Semester: 48 Hrs
Credits: 4   **Subject Code: U1CAC32**
Objectives:

➢ To learn the systematic way of solving problems
➢ To understand the different methods of organizing large amounts of data
➢ To efficiently implement the different data structures

Unit I   **10 Hrs**

Basic Concepts: System Life Cycle – Algorithm Specification – Performance Analysis. Arrays and Structures: Arrays – Dynamically Allocated Arrays – Polynomials – Sparse Matrices.

Unit II   **9 Hrs**

Stacks and Queues: Stacks – Stacks using Dynamic Arrays – Queues – Circular Queues using Dynamic Arrays – Evaluation of Expressions –

Unit III   **9 Hrs**

Linked Lists: Singly Linked Lists and chains – Linked Stacks and Queues – Polynomials – Additional List Operations : Operations for Circularly Linked Lists – Doubly Linked Lists.

Unit IV   **10 Hrs**

Trees: Introduction – Binary Trees – Binary Tree Traversals – Heaps – Binary Search Trees.

Unit V   **10 Hrs**

Graphs: The Graph Abstract Data Type – Elementary Graph Operations – Minimum Cost Spanning Trees – Shortest Paths and Transitive Closure.

Text Book :

        Fundamentals of Data Structures in C , Horowitz, Sahni, Anderson-Freed, 2nd Edition, University Press Private Limited, 2008.

                 Unit I: Chapter 1 – 1.1, 1.3, 1.5
                          Chapter 2 – 2.1, 2.2, 2.4, 2.5
                 Unit II: Chapter 3 – 3.1, 3.2, 3.3, 3.4, 3.6.
                 Unit III: Chapter 4 – 4.1, 4.3, 4.4, 4.5.2, 4.8
                 Unit IV: Chapter 5 – 5.1, 5.2, 5.3, 5.6, 5.7
                 Unit V: Chapter 6 – 6.1, 6.2, 6.3, 6.4

Reference Book:

        1. Classic Data Structures, Debasis Samanta, Second Edition, PHI Learning Private Limited, 2009.

Core 7 Computer Organization

Contact Hours per Week: 4 Hrs
Contact Hours per Semester: 48 Hrs
Credits: 4   **Subject Code: U1CAC33**
Objectives:

- ➢ To have a thorough understanding of the basic structure and operation of a digital computer.
- ➢ To study the different ways of communicating with I/O devices and standard I/O interfaces.
- ➢ To study the hierarchical memory system including cache memories and virtual memory.

Unit I   **11 Hrs**

Basic structure of Computers: Computer types – Functional units – Basic operational concepts – Bus Structures – Software – Historical Perspective. Machine Instructions and Programs: Memory Locations and Addresses – Memory operations - Instructions and Instructions Sequencing – Addressing modes – Assembly Language – Basic Input/Output Operations – Stacks and Queues – Subroutines.

Unit II   **9 Hrs**

Input/Output organization: Accessing I/O devices – Interrupts - Direct Memory Access (DMA) – Buses – Interface Circuits.

Unit III   **8 Hrs**
The Memory System: Some Basic Concepts – Semiconductor RAM Memories - Read-Only
Memories – Cache Memories – Virtual Memories – Memory Management Requirements –
Secondary Storage.

Unit IV   **10 Hrs**
Basic processing unit – Some fundamental concepts – Execution of a Complete Instruction –
Multiple - Bus Organization – Hardwired Control – Micro programmed Control. Pipelining:
Basic Concepts – Data Hazards – Instruction Hazards

Unit V   **10 Hrs**
Embedded Systems: Examples of Embedded Systems – Processor Chips for Embedded
Systems – A simple Microcontroller. Computer Peripherals: Input Devices – Output Devices
– Serial Communication Links.

Text Book:
Computer Organization, Carl Hamacher, Zvonko Vranesic, Safwat Zaky, McGraw-Hill
Higher Education, Fifth Edition, 2002.

Chapters:
> Unit I: 1.1, 1.2, 1.3, 1.4, 1.5, 1.8, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9
> Unit II: 4.1, 4.2, 4.4, 4.5, 4.6
> Unit III: 5.1, 5.2, 5.3, 5.5, 5.7, 5.8, 5.9
> Unit IV: 7.1, 7.2, 7.3, 7.4, 7.5, 8.1, 8.2, 8.3
> Unit V: 9.1, 9.2, 9.3, 10.1, 10.2, 10.3

Reference Books:
1) Computer System Architecture, M. Morris Mano, Pearson Prentice Hall, Third Edition,
2006
2) Computer Organization & Architecture, William Stallings, Pearson Education, Eighth
Edition, 2009

Allied 3 Computers Based Financial Accounting
Contact Hours per Week: 5 Hrs
Contact Hours per Semester: 60 Hrs
Credits: 5   **Subject Code: U1CEA3A**

Objective:
> ➢ Able to understand financial accounting
> ➢ To gain knowledge in final accounts
> ➢ To be familiar with Tally

Unit I   **12 Hrs**
 Financial Accounting: Meaning, Nature and scope, Limitations – Accounting Principles:
Basic Concepts and Conventions-Objectives of accounting-Accounting rules.

Unit II   **12 Hrs**

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Books and records: Recording of business transactions –Types of accounts – Journal – Ledger –Journal Vs ledger. Subsidiary books – Trial balance.

Unit III   **12 Hrs**
Final Accounts: Introduction – Trading account – Profit and loss account – Balance sheet. (Simple problems)

Unit IV   **12 Hrs**
Introduction to Tally: Features of Tally 9 – Company info: Create, Select, Alter and Close or Shut company – Ledger Creation: Creating, Displaying, Altering and Deleting.
F11 – Features and F12- Configuration
Unit V   **12 Hrs**
Voucher Creation: Receipt, Payment, Contra, Journal, Sales, Purchase, Memo, Display, Alter, Delete, Insert. Statement of Reports: Trail balance, Profit and Loss account, Balance sheet.

Text Book:
1. Financial Accounts - R.S.N.Pillai and Bagavathi, S.Chand, 2007
    Unit I: Page Number – 1 to 22
    Unit II: Page Number – 30 to 65
    Unit III: Page Number – 154 to 170
2. Tally (version 9)   - C.Nellai Kannan, 2007
    Unit IV: Page Number – 5 to 61
    Unit V: Page Number – 62 to 102

Reference: Book:
Tally (Accounting Software) S.Palanivel, Margham Publications, 2010

Note: The Question paper shall cover 40% theory and 60% problems

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Core 8 – Java Programming Lab
Contact Hours per Week: 5 Hrs
Contact Hours per Semester: 60 Hrs
Credits : 3   **Subject Code : U1CAC3P1**

Objectives:
➢ Able to do basic programming in Java
➢ Able to understand the fundamentals of object-oriented programming using Java.
➢ Able to do programs connecting database.
➢ Able to design GUI using AWT controls

1) Write a java program Swapping two numbers without using temporary variable
2) Write a java program to Reverse a given number
3) Write a java program to Generate Fibonacci series
4) Write a java program for Sorting in an one dimensional array
5) Write a java program for Performing Matrix operations
6) Write a java program for area calculation using method overloading
7) Write a java program to Check a given number prime or not using command line argument

8) Write a java program for Attendance Management using single inheritance
9) Write a java program for Inventory management using multilevel inheritance.
10) Write a java program for Employee Payroll processing using interface
11) Write a java program for Home Budget using packages
12) Write a java program to demonstrate Built-in Exception
13) Write a java program for Voter's Eligibility using User Defined Exception
14) Write a java program to generate Addition table and Multiplication table using Multithreading.
15) Write a java program for String manipulation
16) Write a java program for String Buffer manipulation
17) Write a java program for Applet – Animation
18) Write a java program to compare two files using Byte Stream
19) Write a java program for Population Census using JDBC
20) Write a java program using AWT controls

Core 9 – Lab   Data Structure using C Lab

Contact Hours per Week: 5 Hrs
Contact Hours per Semester: 60 Hrs
Credits: 3   **Subject Code: U1CAC3P2**

Objectives:
  ➢ To implement the various data structures as Abstract Data Types
  ➢ Able to choose the appropriate data structure and algorithm design method for a specified application.

1. Program to implement insertion sort using arrays.
2. Program to implement exchange sort using arrays.
3. Program to implement matrix addition, subtraction and multiplication.
4. Program to calculate employee pay bill using Structures.
5. Program to implement Stack.
6. Program to implement Queues.
7. Program to convert prefix to postfix expression using pointers.
8. Program to convert infix expression to postfix expression using stack.
9. Program to implement Linked List.
10. Program to implement Circular Linked List.
11. Program to implement Doubly Linked List.
12. Program to implement Binary tree traversal.
13. Program to implement Binary Search tree.
14. Program to implement DFS in C.
15. Program to implement Priority Queue using heap.

SBE – 3 Tally Lab

Contact Hours per Week: 2 Hrs
Contact Hours per Semester: 24 Hrs
Credits: 2   **Subject Code: U1CAS3P1**

Objective:
  ➢ To get knowledge in computerized accounting methods that is used worldwide nowadays.

➢ Able to prepare final accounts of a company.

1. Company Creation
2. Ledger Creation
3. Voucher Creation
   a) Receipt voucher
   b) Payment voucher
   c) Contra voucher
   d) Journal voucher
   e) Sales voucher
   f) Purchase voucher
4. View Reports
   a) Purchase Register
   b) Sales Register
   c) Journal Register
   d) Outstanding Receivable
   e) Outstanding Payable
   f) Final accounts
   g) Day Book
5. Printing the Reports
   a) Multi-Accounts printing
   b) Final Accounts Printing
   c) Cheque printing

Core 10 Database Management System

Contact Hours per Week: 4 Hrs
Contact Hours per Semester: 48 Hrs
Credits: 4   **Subject Code : U1CAC41**

Objectives:
➢ To acquire the basic knowledge and practical skills relating to Relational Database Management Systems.
➢ To understand the fundamentals of a relational database.
➢ Able to describe Structured Query Language (SQL) as a data definition language, data manipulation language, and data control language
➢ Able to write SQL /PLSQL queries to create, report, and update data in a relational database.
➢ To design entity relationship models for a business problem and develop a normalized database structure.

Unit I   **8 Hrs**
Introduction to Database Management System (DBMS): Introduction: Why a Database-Characteristics of data in a database- Database   Management System-Why DBMS-Types of DBMS
Introduction to Relational Database Management System (RDBMS): Introduction: RDBMS Terminology-The Relational Data Structure-   Relational Date Integrity-Relational Data Manipulation-Codd's Rules

Database Architecture and Data modeling: Introduction: Conceptual, Physical and Logical database models-Database Design-Design Constraints-Functional Dependencies.

Unit II   10 Hrs
Entity Relationship Modeling: Introduction: E-R Model-Components of an ER Model-ER diagram Conventions-Relationship-Entity List-ER Diagrams-ER modeling Symbols.
Data Normalization: Introduction: Introductions-First Normal Form(1NF)-Second Normal Form(2NF)-Third Normal Form(3NF)-Boyce-Codd Normal Form(BCNF)-Fourth Normal Form(4NF)-Fifth Normal Form(5NF)-Domain Key Normal Form(DKNF)-Demoralization.
Relational Algebra & Relational Calculus: Introduction: Relational Algebra-Relational Algebraic Operations-Relational Calculus**.**

Unit III   14 Hrs
Introduction to Structured Query Language (SQL): Introduction: SQL-Characteristics and Functions of SQL-Types and Uses of SQL Commands-Fundamental commands and advantages of SQL-Tables-SQL DML and DDL Statements-SQL Operators-SQL Joins-SQL Constraints-Data Control Language (DCL)-SQL Views-SQL Date and Null Functions-SQL Data types-SQL Functions –Indexes-Sequences with SQL-Oracle Built in Functions-SQL Sub query.
PL/SQL: Introduction of Pl/SQL-Difference between PL/SQL and SQL-Advantages of PL/SQL-PL/SQL Block-Conditional, Iterative Statements, Operators, Control Structure, Functionality ,coding, Anonymous Block in PL/SQL- Packages-Variables in PL/SQL-Array, Error, Exception Handling in PL/SQL-For Loops-Cursors-PL/SQL subprograms-Stored Procedures, Parameters, Discovering Errors ,Printing Variables ,Simple Programs in PL/SQL-Control Flow, The Character Set, PL/SQL Data types in PL/SQL.
Triggers: Introduction: Trigger-Structure, Syntax of Triggers-Creating Triggers-How Triggers are used-Triggers Vs Declarative Integrity Constraints-Parts of Trigger-Triggering event or statement-Trigger Restriction-Trigger Action-Types of Trigger-Before Vs After Trigger-Combinations-Trigger Execution-The Execution Model of Triggers and Integrity Constraint Checking-Data Access for Triggers-Programming Triggers.

Unit IV   8 Hrs
Database Security: Introduction-Database Environment-Data Security Risks-Complex User Management Requirements-Dimensions of database security-Data Security Requirements-Data base Users-Protecting the data with in the database-Data Encryption-Database Integrity-System Availability Factors-Best Security Practices-Network Security-Authenticating users to the database-security Auditing.
Backup and Recovery: Introduction-Database Backups-Why plan backup-Hardware protection and redundancy-Transaction Logs-Importance of Backups-Database Recovery-Data Storage-Cause of Failures-Recovery concepts and Terminology-Recovery Facilities-Recovery Techniques-Detached Transaction Actions-Recovery in Multi-Database Systems-Database Recovery from Catastrophic Failures
Web Database: Introduction-Internet and World Wide-Accessing Database on the web-Oracle9i Application Server Portal.

Unit V   8 Hrs
Knowledge Discovery in Database (KDD): Introduction-Knowledge Discovery -Knowledge Discovery in Database-Basic Features KDD-Advantages of KDD-Phases of KDD-KDD Techniques.

Data warehouse and Data Marts: Introduction-Data in a Data Warehouse-Data Warehouse Design Issues-OLTP Vs Data Warehouse-Configuration of Data Warehouse Process-Data Warehouse Components-Structure of a Data Warehouse-Data Warehouse Lifecycle-The Data Warehouse Environment-Data architecture for Data Warehouse Operations-How Much Data?-Data integration and Transformation Process-Technology to support the Data Warehouse-Database Management-User Interfaces to the Data Warehouse-Data Warehousing System-Advantages of data warehouse-Uses of a Data Warehouse-Data Marts-Advantages of Data Marts-Types of Data Marts.

Text Book:
1) Database Management Systems by Alexis Leon and Mathews Leon, Leon Vikas Publishing, Chennai 2002.

  Unit I : Chapter 5,7,8.
  Unit II : Chapter 9,11,12.
  Unit IV : Chapters 27,30,38.
  Unit V : Chapters 39,40.

2) Database Management System by Rakesh Saini, M.M.S.Rauthan. Abhay Saxena. Bindu Sharma,Vayu Education of India publishing, First Edition 2010.

  Unit III : Chapter 4 - 4.1 to 4.45 and 4.47 to 4.49
       Chapter 6, Chapter 7.1 to 7.23

Reference Books:
1) Database System concepts by Peter Rob, Carlos Coronel, Publishing by Cengage Learning, First Edition.
2) Database Systems using Oracle by Nilesh Shah, Published by PHI Learning, Second Edition 2010.

Core 11 - Software Engineering

Contact Hours per Week: 4 Hrs
Contact Hours per Semester: 48 Hrs
Credits: 4   **Subject Code: U1CAC42**

Objectives:
➢ To illustrate the students how the software development project taken in industry.
➢ Able to provide students a good understanding of software engineering concepts with a real feel of various activities in the software development process.

Unit I   **10 Hrs**
Introduction to Software Engineering: Introduction: Software – What is Good Software? – Software Engineering – Components of Software Engineering – Software Development Models – Comparative Analysis of Process Models.
Software Estimation: Size, Effort and Cost: Software Metrics: Introduction – metrics Database – FPA and Mark II FPA Tool for Estimation – Case illustration, FPA and Mark II FPA – Estimation of Effort and schedule – COCOMO – Software Cost Estimation.

Unit II   **9 Hrs**
Software Risk Management: Risk and Risk Management – Introduction to Software Risk – Software Risk Management – Risk Mitigation through RMMM Plan.

Quality Engineering for Software Quality Assurance: Quality – ISO 9001 Standard – Software Quality and Assurance – Testing Techniques for SQA – Test Cast Design – Software Testing Strategies.

Unit III   **10 Hrs**

Software Engineering Tools: Software Engineering Tools—Introduction – Analysis Tools – Modeling For Representation – Requirements Engineering – Work Breakdown Structure – Prototyping – CASE, I-CASE Tools.
Systems Analysis: Systems – Systems Modeling – Structured Systems Analysis – Software Requirement Specification – Information Systems.

Unit IV   **10 Hrs**
Systems Design: Designing Systems: Introduction – The Design Development Process – Data Structure and Database Design – Systems Design Architecture – Systems Behaviour Design.
Introduction to Database Design: Introduction to Database – The Relational Data Models – Relational Database Design – Distributed Database – Database Management Tools – Selection of RDBMS.

Unit V   **9 Hrs**
User Interface Design: User Interface - User Interface Analysis and Design – Improving Effectiveness of UI – Guidelines for Designing UI Components.

Procedural Design and Use of Reusable Components: Procedure Design – Structured Programming - Reusable Code – Components-based Software Engineering – Program Verification.

Text Book: Software Engineering Principles and Practice, Waman S Jawadekar, 13th
                Reprint, 2010, Tata McGraw Hill Education Private Limited, New Delhi.

Unit I	:	Chapters 1, 2
Unit II	:	Chapters 3 (3.1 to 3.4), 4
Unit III	:	Chapters 5, 7
Unit IV	:	Chapters 8(8.1 to 8.5), 9
Unit V	:	Chapters 10, 11

Reference Book: Fundamentals of Software Engineering, Rajib Mall, 3rd Edition, 2009, PHI
                Learning Private Limited, New Delhi.

Core 12 - Operating System
Contact Hours per Week: 4 Hrs
Contact Hours per Semester: 48 Hrs
Credits: 4   **Subject Code: U1CAC43**
Objectives:
  ➢ To know about Operating systems Components and its services.
  ➢ To learn CPU-Scheduling algorithm, Critical-section problem Deadlock.
  ➢ To identify various Memory-Management Techniques
  ➢ To gain knowledge of File systems, Directory structure and Mass storage devices.

Unit I   **10 Hrs**

Introduction: Operating System Definition, Mainframe System, Multiprocessor System, Distributed System, Real Time system, Handheld System - I/O Structure - Storage Structure - Network Structure- Operating System Services - System Call-System program.

Unit II   **10 Hrs**

Process Management: Process Concepts – Process Scheduling concept-Scheduling Algorithm – Critical Section problem - Synchronization Hardware- Deadlock: System Model, Deadlock Characterization- Deadlock Detection, Recovery from Deadlock , Deadlock Prevention, Deadlock Avoidance.

Unit III   **9 Hrs**

Storage Management: Concept- Contiguous Memory allocation – Paging – Segmentation – Virtual Memory: Background-Demand paging-Page Replacement.

Unit IV   **9 Hrs**

File-System Interface: File Concept - Access Methods- Directory Structure - Protection-Directory implementation – Allocation Method - Free space management-Recovery.

Unit V   **10 Hrs**

I/O Sub System: I/O Hardware – Application I/O Interface - Disk Structure - Disk Scheduling - Disk Management - Swap space management – RAID Structure - Disk Attachment.

TextBook: Operating System Concepts [6th Edition] - Abraham Silberschatz, Peter Baer Galvin, Greg Gagne - Jhon Wiley & Sons Inc.2002.

Unit I   Chapters 1.1, 1.2, 1.4, 1.5, 1.7,1.8 , 2.2, 2.3, 2.6, 3.2, 3.3, 3.4
Unit II   Chapters 4.1, 4.2, 4.5, 6.3, 7.2, 7.3, 7.7, 8.1, 8.2,8.4,to 8.7
Unit III   Chapters 9.1, 9.3 to 9.5, 10.1, 10.2, 10.4
Unit IV   Chapters 11.1 to 11.3, 11.6, 12.3, 12.4, 12.5 ,12.7
Unit V   Chapters 13.2, 13.3 , 14.1 to14.6

Reference Books:

1. An Introduction to Operating System – Harvey M.Deital,Addison,Wesely 1984
2. Operating Systems – Design and Implementation – Andrew S.Tannenbaum Prentice Hall, 1987

Allied 4 – Principles of Costing

    Contact Hours per week   **: 5 Hrs**
    Contact Hours per Semester   **: 60 Hrs**
    Credits: 5   **Subject Code: U1CEA4A**

Objective:
             ➢ Able to know basics of cost accounting
             ➢ To acquire knowledge in marginal costing

Unit I   **12 Hrs**

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Cost-Costing-Cost Accounting – Meaning, Objectives – Advantages – Limitations – Difference between Financial accounting Vs. Cost accounting.

Unit II   **12 Hrs**

Elements of cost – Types of cost – Classification of cost – Preparation of Cost sheet.

Unit III   **12 Hrs**

Material of cost – Techniques (Stock Level, EOQ) of Material control – Methods of pricing material Issues.

Unit IV   **12 Hrs**

Labour Cost – Meaning – Direct labour – Indirect labour – Time keeping, idle time – Method of Remuneration – Incentive and Bonus systems.

Unit V   **12 Hrs**

Marginal Costing – Meaning – Features – Advantages – Disadvantages – Break Even analysis – P/V ratio – Margin of safety.

Text Books:

1. Cost Accounting – R.S.N. Pillai V.Bagavathi, S.Chand & Company LTD
   Unit I   Page No: 1 to 22
   Unit III   Page No: 184 to 234
   Unit V   Page No : 575 to 668

2. Cost Accounting – L.P.Ramalingam, Dharani Publications.

   Unit II   Chapters: 2.1 to 2.24
   Unit IV   Chapters: 3.1 to 3.29

Core 13 - Lab Visual Programming Lab

Contact Hours per week   **: 6 Hrs**
Contact Hours per Semester   **: 72 Hrs**
Credits: 3   **Subject Code: U1CAC4P1**

Objective:
  ➢ To let the students gain knowledge about the programming concepts in Visual Basic.

1. Develop a Visual Basic Application to Check the given number in one of categories like
   i. Armstrong Number
   i. Magic Number.
   ii. Perfect Number.
   iii. Palindrome Number.
2. Design a Visual Basic program to calculate simple and compound interest.
3. Develop a Visual Basic Application to implement the Calculator operations by using Control Array.
4. Design a Visual Basic program to perform matrix operations.

5. Develop a Visual Basic Application to perform string operations.
6. Create a note pad using VB.
7. Develop a Visual Basic Application to calculate telephone bill using ActiveX DLL.
8. Create an application to explore different files in different directories which are in different drives using drive control, directory control and file control tools in a system.
9. Write a VB program to animate a butterfly and to bounce a ball.
10. A VB application on Inventory management using data control.
11. Write a program in visual basic to connect Access with visual Basic for to maintain student records using ADODB.
12. Write a program in visual basic to generate a data report (library maintenance).
13. Write a VB program to draw different geometric shapes without using controls.
14. Design a VB program to conduct online quiz.
15. Develop a VB program that enables chatting using winsock.
16. Develop a Visual Basic Application to generate calendar.

Core 14 – Lab   DBMS Lab

Contact Hours per Week: 5 Hrs
Contact Hours per Semester: 48 Hrs
Credits: 3   **Subject Code: U1CAC4P2**

Objectives:

➢ To understand SQL /PLSQL queries to create, delete, and update data in a database.
➢ To know the fundamental concepts of transaction processing.
➢ To understand   forms and report generation.

SQL
1) Data Definition Language (DDL) Constraints.
2) Data Definition Language (DDL) Commands.
3) Data Manipulation Language (DML) Commands.
4) Transaction Control Language Statements (TCS)

PL/SQL
5) Implement PL/SQL program using different statements.
6) Implement PL/SQL program using Exception Handling
        i)User Defined Exception.
        ii) Built in Exception
7) Implement PL/SQL program using Cursor.
        i)Implicit Cursor.
        ii)Explicit Cursor.
8) Implement PL/SQL program using Procedure.
9) Implement PL/SQL program using Function.
10) Implement PL/SQL program using Triggers.
11) Implement PL/SQL program using Packages.
Forms and Report Generation

1) Student Mark Manipulation.
2) Employee Pay Bill Preparation
3) Ticket Reservation.

SBE - 4 Introduction to Multimedia

Contact Hours per week	: 2 hrs	
Contact Hours per semester	: 24hrs	
Credits	: 2	**Subject Code: U1CAS41**

Objectives:
➢ To do Multimedia applications that engages students and provides valuable learning opportunities.
➢ Able to create and design rather than "absorbing representations created by others".
➢ Able to bring the real world into the classroom.

Unit I   **4 Hrs**

Multimedia : Definition – Use of Multimedia - Multimedia in Business – Multimedia in Schools – Multimedia in Home – Multimedia in Public Places – Virtual Reality – Hardware and Software Tools.

Unit II   **5 Hrs**

Text: Fonts and Faces – Using Text in Multimedia – Computers and Text – Font Editing and Design Tools – Hypermedia and Hypertext

Unit III   **5 Hrs**

Images: Making Still images – Colors – Image File Formats.
Animation: The power of motion – Principles of animation – Animation by computer- Making animation that work.

Unit IV   **5 Hrs**

Sound: The power of sound – Multimedia system sounds – Digital Audio – Making MIDI Audio – Audio File Formats – Adding sound to your multimedia project.
Video: How Video works – Digital display standard – Digital Video – Video Recording and Tape Formats – Shooting and Editing Video.

Unit V   **5 Hrs**

Designing for World Wide Web: Working on Web – Text for the Web – Images for the Web – Sound for the Web – Animation for the Web

Text Book:

Multimedia: Making It Work - Tay Vaughan – Seventh Edition – Tata McGraw- Hill, 2008.

Unit I	: Chapter 1, 9, 10
Unit II	: Chapter 4
Unit III	: Chapter 6, 7
Unit IV	: Chapter 5, 8
Unit V	: Chapter 14

Reference Book:

Multimedia Technology and Applications – David Hillman – Galgotia Publications, 1998.

Course Name: **Master of Computer Applications**
Discipline: **Computer Applications**
COURSE SCHEME:

Semester	Part	Subject	Hour	Credit	Int+Ext = Total	Subject Code	Revision
III	Core 12	Accountancy and Financial Management	5	5	25+75=100	P1CEC3A	Interchanged
	Core 13	Operating System	5	5	25+75=100	P1CAC31	Interchanged
	Core 14	Java Programming	5	5	25+75=100	P1CAC32	New
	Core 15 – Lab	Java Programming Lab	5	3	40+60=100	P1CAC3P1	Revised
	Core 16 – Lab	Web Technology Lab	5	3	40+60=100	P1CAC3P2	Interchanged
	Elective I	Web Technology/ Computer Graphics/ Biometrics	5	5	25+75=100	P1CAE31/ P1CAE32/ P1CAE33	Interchanged / Interchanged / New

Semester	Part	Subject	Hour	Credit	Int+Ext = Total	Subject Code	Revision
IV	Core 17	Software Engineering	5	5	25+75=100	P1CAC41	Revised
	Core 18	Database Management System	5	5	25+75=100	P1CAC42	Revised
	Core 19	Computer Networks	5	5	25+75=100	P1CAC43	Interchanged & Revised
	Core 20 – Lab	Client Server Lab	5	3	40+60=100	P1CAC4P1	Title Changed and Revised
	Core 21 – Lab	Software Development Lab	5	3	40+60=100	P1CAC4PV	New
	Elective II	Data Mining and Warehousing	5	5	25+75=100	P1CAE41/ P1CAE42/ P1CAE43	Interchanged and Revised/

		/ Artificial Neural Network/ Parallel Programming					New/ New

Core 12 Accountancy and Financial Management

Contact Hours per Week : 5 Hrs
Contact Hours per Semester : 60 Hrs
Credits : 5   **Subject Code : P1CEC3A**

Objective:
 ➢ To gain knowledge in financial accounting.
 ➢ Able to know about final accounts
 ➢ To be familiar with budgeting and marginal costing

UNIT I   **12 Hrs**
Financial Accounting – Principles of accounting – double accounting system – advantages –
Types of accounts – journal – Ledger – Trial balance

UNIT II   **12 Hrs**
Final Accounts – Trading account – Profit and Loss account – Balance sheet with
adjustments.

UNIT III   **12 Hrs**
Accounting Ratios – Meaning – Objectives – Solvency ratios – Profitability ratios – Activity
ratios – Leverage ratios – Advantages and limitations of ratio.

UNIT IV   **12 Hrs**
Budgeting – Meaning, characteristics of good budgeting – Objectives – Advantages and
disadvantages of budgeting – types of budgets – sales budget, Production budget – Material
budget – Labour budget – Flexible budget – Cash budget – Zero based budgeting –
Advantages and limitations.

UNIT V   **12 Hrs**
 Marginal costing – Meaning – Objectives – Assumptions – Break – even analysis –
Marginal cost statement – Profit Volume ratio – Margin of Safety – Sales required to earn the
expected profit.

Text Book:
1. Advanced Accounting I – Dr. Peer Mohamed & Dr.Shazuli Ibrahim
            Unit – I (1.01 – 3.12)
            Unit – II (6.01 – 7.64)
2. Management Accounting – Dr.S.N.Maheswari, Vikas, 2010.
            Unit – III (B.23 – B.103)

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Unit – IV (C.3 – C.66)
Unit – V (C.165 – C.223)

Reference Book:
1. Advanced Accounting I – Dr. Peer Mohamed & Dr. Shazuli Ibrahim, Pass Publications, 2008

Unit – I (1.01 – 3.12)
Unit – II (6.01 – 7.64)

Note: The Question paper shall cover 40% theory and 60% problems

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Core 13   Operating System

Contact Hours per Week: 5 Hrs
Contact Hours per Semester: 60 Hrs
Credits: 5   **Subject Code: P1CAC31**

Objectives:
 ➢ To illustrate the students how the software that manages the hardware resources.
 ➢ Able to understand the functions of the operating systems.

Unit I: **12 Hrs**
Operating system-functions and structure: What is an Operating System? – Different Services of the Operating System – Operating System Structure – Virtual Machine – Booting.
Information Management: Direct Memory Access (DMA) – The File System – Device Driver (DD) - Terminal I/O.

Unit II: **12 Hrs**
Process Management: Introduction – What is a Process? - Evolution of Multiprogramming – Context Switching – Process States – Process State Transitions – Process Control Block – Process Hierarchy – Operations on a Process – Create a Process – Kill a Process – Dispatch a Process – Change the Priority of a Process – Block a Process – Dispatch a Process – Time Up a Process – Wake Up a Process – Suspend/Resume Operations – Process Scheduling – Multithreading.
Inter Process Communication: The Procedure-Consumer Problems – Solutions to the Producer-Consumer Problems – Classical IPC problems.

Unit III: **12 Hrs**
Deadlocks: Introduction – Graphical Representation of a Deadlock – Deadlock Prerequisites – Deadlock Strategies
Memory Management: Introduction – Single Contiguous Memory Management – Fixed Partitioned Memory Management – Variable Partitions – Non-contiguous Allocation-General Concepts – Paging – Segmentation – Combined Systems – Virtual Memory Management Systems.

Unit IV: **12 Hrs**
Operating System: Security and Protection: Introduction – Security Threats – Attacks on Security – Security Violation through Parameters – Computer Worms – Computer Virus – Authentication – Protections Mechanisms – Data Encryption – Basic concepts – Digital Signature.

Unit V: 12 Hrs

Windows NT/2000 -A Case Study: Introduction – Windows NT – Windows 2000.
UNIX: A Case Study: Introduction – The History of UNIX – overview of UNIX – UNIX file systems – Data Structures for Process/Memory Management – Executing and Terminating a Program in UNIX – Process Scheduling – Memory Management – Solaris Process/Thread Management and Synchronization-A Case Study.

Text Book: Operating Systems, Achyut S Godbole, 2nd Edition, Tata McGraw Hill Education Private Limited, New Delhi, 2005.

Unit I	:	Chapters 3, 4(4.1 to 4.4)
Unit II	:	Chapters 5, 6
Unit III	:	Chapters 7, 8
Unit IV	:	Chapters 9(9.1 to 9.6), (9.8 to 9.12)
Unit V	:	Chapters 12, 13(13.1 to 13.5), (13.7), (13.9 to 13.11)

Reference Book: Operating System Concepts, Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, 7th Edition – Jhon Wiley & Sons Inc. 2005.

Core 14   Java Programming

Contact Hours per Week: 5 Hrs
Contact Hours per Semester: 60 Hrs
Credits: 5 **Subject Code: P1CAC32**

Objectives:
- To understand fundamentals of java programming such as variables, conditional and iterative execution, methods, etc.
- To understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
- Able to write GUI programs using AWT controls.

Unit I 10 Hrs

Essential Java: All about Java – Java appears – All about Bytecodes – Java Security – Java Programs – Getting and Installing Java – What about class path – What is JSP – What is J2EE – What is JSF – What is J2ME- What is Struts – Creating an application – Compiling code – Running code – Commenting your code- Importing java packages and classes.
Variables, Arrays and Strings: Variables – Data Typing – Arrays – Strings.
Operators, Conditionals and Loops: Operators – Conditionals – Loops.

Unit II 10 Hrs

Object Oriented Programming: Classes – Objects – Data members – Methods – Inheritance – Exception handling.
Inheritance, Inner Classes and Interfaces: Why Inheritance? – Why Interface? – Why Inner Classes?

Unit III 12 Hrs

Working with Multiple Threads: Using Threads in Java.

Working with Streams: Streams, Readers and Writers. Creating a Package – Creating Packages that have sub packages.

Talking to Database: What does JDBC do? – JDBC Versus ODBC – Two tier and Three Tier Models- Introducing SQL.

Unit IV **14 Hrs**

AWT: Applets, Applications and Event Handling: The Abstract Windowing Tool kit – Applets – Applications – Handling Events.

AWT: Text Fields, Buttons, Checkboxes, Radio Buttons and Layouts: Text Fields – Buttons – Checkboxes – Radio Buttons – Layouts.

Unit V **14 Hrs**

AWT: Lists, Choices, Text Areas, Scrollbars and Scroll Panes: Lists – Choices – Text Areas – Scrollbars – Scroll Panes.

AWT: Graphics, Images, Text and Fonts: Graphics – Images – Text and Fonts – The Keyboard and Mouse.

AWT: Windows, Menus and Dialog Boxes: Windows – Menus – Dialog Boxes.

Text Book:

Java 2 Programming Black book, Steven Holzner et al , Dreamtech press, 2008.

Unit I	Chapter 1(Page Number 1 to 10, 16 to 35)
	Chapter 2 (Page Number 49 to 92),
	Chapter 3 (Page Number 105 to 147)
Unit II	Chapter 4(Page Number 149 to 203)
	Chapter 5 (Page Number 209 to 252)
Unit III	Chapter 13(Page Number 565 to 596, 603 to 608)
	Chapter 11(Page Number 481 to 518)
	Chapter 27(Page Number 1205 and 1206)
	Chapter 29 (Page Number 1261 to1265)
Unit IV	Chapter 6(Page Number 255 to 292)
	Chapter 7 (Page Number 307 to 341)
Unit V	Chapter 8(Page Number 347 to 384)
	Chapter 9(Page Number 387 to 432)
	Chapter 10(Page Number 435 to 478)

Reference Book:

1. The Complete Reference Java2 by Herbert Schildt, Tata McGraw Hill edition, Fifth edition, 2008.

2. Object Oriented Programming With Java, Rajkumar Buyya, S.Thamarai Selvi, Xingchen Chu, Tata McGraw Hill, 2009.

3. Object Oriented Programming in Java, Dr. G.T. Thampi, DreamTech Press, 2009.

Core 15 Lab   Java Programming Lab

Contact Hours per Week: 5 Hrs

Contact Hours per Semester: 60 Hrs

Credits: 3 **Subject Code: P1CAC3P1**

Objectives:

➢ Able to do basic programming in Java
➢ Able to understand the fundamentals of object-oriented programming using Java.
➢ Able to do programs connecting database.
➢ Able to design GUI using AWT controls

1. Write a Java program for sorting n numbers using command-line arguments.
2. Write a Java program to get an array of n numbers. Remove the duplicates in the array.
3. Write a program to get a number and print that numbers in words.
4. Write a Java program for method overloading.
5. Write a Java program for method overriding.
6. Write a Java program to generate QUIZ using array.
7. Write a Java program for pre-defined Exception.
8. Write a Java program for a User-Defined Exception,
9. Write a java program using multilevel inheritance
10. Write a java program using interface.
11. Write a java program using Multithreading.
12. Write a java program for String Manipulation
13. Write a java program for Applet – Animation
14. Write a java program to illustrate file concept
15. Write a java program using JDBC
16. Write a java program using packages.
17. Write a java program to demonstrate action listeners and event listeners
18. Write a java program to use AWT components.

Core 16 - Web Technology Lab

Contact Hours per Week: 5 Hrs
Contact Hours per Semester: 60 Hrs
Credits: 3   **Subject Code: P1CAC3P2**

Objectives:

➢ To create simple Web pages and provide client side validation.
➢ To create dynamic web pages using server side scripting.

1. Create a web site using HTML tags
2. Online Exam using JavaScript
3. Registration Form Validation using Java Script
4. Create a slide show using DHTML Transition Effects
5. Create a web site using Multimedia Components
6. Create an XML document for displaying book details with DTD validation and XML Schema
7. Create a computer dictionary using Servlet
8. Create a shopping web site using JSP
9. Develop online applications using PHP

Elective 1 - Web Technology

Contact Hours per Week: 5 Hrs

Contact Hours per Semester: 60 Hrs
Credits: 5   **Subject Code: P1CAE31**
Objectives:
  ➢ Able to get an introduction about various Scripting Languages.
  ➢ To provide up-to-date survey of developments in Web Technologies.
  ➢ Able to know techniques involved to support real-time Software development.

Unit I   **12 Hrs**
Basic Web Concepts: Introduction – URL – MIME – CGI – Introduction to SGML. HTML
Common Tags: Introduction – HTML Basics – Forms – Frames – Tables – Web Page
Design.
Java Scripts : Introduction – Basics of Java Script – Control Structures – Pop Up Boxes –
Functions – Arrays – Events – Objects – Simple Web Applications.

Unit II   **11 Hrs**
Dynamic HTML: Introduction – Cascading Style Sheets – Object Model and Collections –
Event Model – Filters and Transition – Data Binding – Data Control.
XML: Introduction – Document Type Definition – XML Schemas – Document Object
Model – Using XML Processors:DOM and SAX.

Unit III   **13 Hrs**
Java Beans: Introduction – BDK – Introspection – Using Bound Properties – BeanInfo
Interface – Constrained Properties – Java Beans API – Introduction to EJB.
Web Servers and Servlets: Introduction – Servlets – Web Servers – Deployment of Servlets
– Invoking Servlet using HTML – HTTP-GET and POST Requests – Session Tracking –
Cookies – JDBC- Multi-tier Applications.

Unit IV   **12 Hrs**
Introduction to JSP: Introduction – The problem with Servlet – Anatomy of JSP page – JSP
Processing – Tomcat Server – Testing Tomcat.
JSP Application Development : Introduction – Generating Dynamic Content – Using
Scripting Elements – Implicit JSP Objects – Conditional Processing – Error Handling and
Debugging – Passing Control and Data between Pages – Sessions. Database Access.

Unit V: **12 Hrs**
An Introduction to PHP : PHP – Using PHP – Variables – Program Control – Built-in
Functions – Regular Expressions – Using Files – Building Web Applications with PHP :
Tracking Users – Using Databases.

Text Books:

1. Web Technology, A.A. Puntambekar, Technical Publications Pune, 1st Edition, 2009.

        Unit I Chapter – 1, 2, 3
        Unit II Chapter – 4, 5
        Unit III Chapter – 6, 7
        Unit IV Chapter – 8, 9, 10

2. Web Programming – Building Internet Applications, Chris Bates, Wiley India, 3rd Edition.
   Unit V Chapter 12

Reference Books :

1. Web Enabled Commercial Applications Development Using HTML, DHTML,
      JavaScript , PERL CGI. – Ivan Bayross – 3rd Edition.
2. Web Technology – A Computer Perspective, Jeffrey Jackson, Pearson Education, 2009.

Elective I - Computer Graphics

Contact Hours per Week   : 5Hrs
Contact Hours per Semester: 60 Hrs
Credits   : 5   **Subject Code: P1CAE32**

Objectives:
- ➢ To know about the basic concepts of computer graphics
- ➢ To learn various algorithms for drawing line, circle, and ellipse
- ➢ To gain knowledge in 2D and 3D Transformations
- ➢ To know about color models

Unit I   **12 Hrs**

A survey of computer graphics: Computer –Aided Design-Presentation Graphics-Computer Art-Entertainment-Education and training-Visualization-Image Processing-Graphical User Interfaces- **Overview of Graphics Systems**: Video display devices- Raster scan systems- Random scan systems- Input devices- Hard copy devices- Graphics software- **Output Primitives**: Points and Lines – Line Drawing algorithms –Circle Generating Algorithm- Ellipse Generating Algorithm- Filled –area primitives.

Unit II   **12 Hrs**

2D Geometric Transformations: Basic Transformations-Matrix representations and Homogenous Coordinates-Composite Transformations-Other Transformations- **2D Viewing** : Window to Viewport Coordinate transformations-Point Clipping – Line Clipping – Polygon Clipping – Text Clipping – Exterior Clipping.

Unit III   **12 Hrs**

3D Concepts : 3D display methods - **3D Object Representation**: Polygon Surfaces- Curved Lines and Surfaces- Blobby objects- Bezier curves- B-Spline Curves - **Visible Surface Detection Methods**:. Classification of Visible surface detection Algorithms- Z-buffer algorithm- scanline algorithm- ray-Casting method- wireframe methods.

Unit IV   **12 Hrs**

Illumination Models and surface rendering methods: Light sources - Basic illumination methods-Constant intensity shading- Gouraud shading-Phong shading techniques-Basic ray tracing algorithm- basic radiosity model-texture mapping- bump mapping.

Unit V   **12 Hrs**

Placed in the Academic Council Meeting held on 23.03.2013   Annexure I   B.C.A.

1179

Color Models and color applications: Various color models:RGB Color model-YIQ color model-CMY color model-HSV color model-Conversion between HSV and RGB models-HLS color model-Color Selection and Applications.

Text Book:
1. "Computer Graphics C Version", Donald Hearn, M. Pauline Baker, Second Edition, Pearson Education, 2009

Unit I : Chapter 1, 2 (2.1,2.2,2.3,2.5,2.6,2.7),3 (3.1,3.2,3.5,3.6,3.11)
Unit II : Chapter 5(5.1,5.2,5.3,5.4), 6(6.3,6.6,6.7,6.8,6.10,6.11)
Unit III : Chapter 9 (9.1),10(10.1,10.2,10.5,10.8,10.9),
        13 (13.1,13.3,13.5,13.10,13.12)
Unit IV : Chapter 14 (14.1,14.2,14.5,14.6,14.7,14.9)
Unit V: Chapter 15(15.4,15.5,15.6,15.7,15.8,15.9,15.10)

Reference Books:
1. "Computer Graphics " Second edition, Zhigang xiang, Roy Plastock, Schaum's outlines, Tata Mc- Graw hill edition, 2004.
2. Computer Graphics, Second Edition, Steven Harrington, McGraw-Hill International EditionsTMH,1987

Elective I   Biometrics

Contact Hours per Week   : 5Hrs
Contact Hours per Semester: 60 Hrs
Credits   : 5   **Subject Code: P1CAE33**

Objectives:
- To Study physiological or behavioral characteristics or both, that can be utilized to verify the identity of individuals.
- Able to know about how authentication technologies work.

Unit I   10 Hrs
How Authentication Technologies Work: What you know: Password and PINs-What you Have: Cards and Tokens-What you are:Biometrics-Multi-factor Authentication-Subverting the system-Deploying Authentication Systems-Economics of Authentication.
How Biometrics Work: Brief History of Biometrics-Why use Biometrics? –Key elements of Biometric Systems-User Training.

Unit II   12 Hrs
Fingerprint and Hand Geometry: History of Fingerprints – Fingerprint cards-Manual Matching of fingerprint-The first age of Automation-The second age of Automation – Template Extraction and size-Robustness, Expected Accuracy- Vulnerabilities. Hand Geometry: History of Hand Geometry- The Technology – Uses of Hand Geometry-Robustness, Expected Accuracy- Vulnerabilities.
Facial and Voice Recognition: Facial Recognition Applications – Facial Recognition Technology – Voice Verification.

Unit III   14 Hrs
Eye Biometrics: Iris and Retina Scanning: Iris Scanning- Iris Recognition Technology-Applications.-Retina Scanning- Accuracy.

Signature Recognition and Keystroke Dynamics: Signature Recognition-How Signature Recognition Works- History and Development- Implementation Studies- Limitations- Keystroke Dynamics- History-Application-Digraph Representation- Other Uses.

Unit IV   **12 Hrs**
Esoteric Biometrics: Vein Pattern- Facial Thermography – DNA-Sweat Pores – Hand Grip-Fingernail bed- Body Odor- Ear- Gait-Skin Luminescence – Brain wave Pattern- Footprint and Foot Dynamics- The Future.

Unit V   **12 Hrs**
Biometrics in Large-Scale Systems: Getting Started- Document and Procurement Process-Specifying the Systems-Sample AFIS RFP Overview.
Biometric Testing and Evaluation: Who tests?-Who Benefits?- The Three Bears Principle-Best Practices for Biometrics Testing- Types of Testing –Certification.

Text Book:
              Biometrics: The Ultimate Reference – John D. Woodward,Jr.Nicholas M. Orlans Peter T.Higgins Published by Dreamtech Press, 2003, New Delhi-110002.
              Unit I : Chapter 1,2
              Unit II : Chapter 3,4
              Unit III : Chapter 5,6
              Unit IV : Chapter 7
              Unit V: Chapter 9,11
Reference Books:
1. Sanir Nanavati, Michael Thieme, Biometrics Identity Verification in a Networked world,Wiley Computer Publishing Ltd, New Delhi,2003.
2. John Vacca , Biometric Technologies and Verification Systems, 2007

Core 17 - Software Engineering
Contact Hours per Week: 5 Hrs
Contact Hours per Semester: 60 Hrs
Credits: 5   **Subject Code: P1CAC41**

Objectives:
  ➢ To illustrate the students how the software development project taken in industry.
  ➢ Able to provide students a good understanding of software engineering concepts with a real feel of various activities in the software development process.

Unit I   **12 Hrs**
Introduction: The software engineering discipline- Software development projects – What is wrong with the exploratory style of software development? – Emergence of software engineering – Notable changes in software development practices – Computer systems engineering.

Software Life Cycle Models: Why use a life cycle model? – Classical waterfall model – Iterative waterfall model – Prototyping model – Evolutionary model – Spiral model – comparison of different life cycle models.

Unit II   **12 Hrs**

Software Project Management: Responsibilities of software project manager – Project planning - Metrics for project size estimation – Project estimation techniques – Empirical estimation techniques – COCOMO-a heuristic estimation technique – Halstead's software science – an analytical technique – Staffing level estimation – Scheduling – Organization and team structures – Staffing – Risk management – Software configuration management.

Requirement Gathering and Analysis and Specification: Requirement gathering and specification – Software Requirement Specification (SRS) – Formal system specification – Axiomatic specification – Algebraic specification – Executable specification and 4GL.

Unit III   **12 Hrs**

Software Design: Outcome of a design process – How can we characterize a good software design? – Cohesion and Coupling- Layered arrangement of modules – Approaches to software design – Object-oriented versus Function-oriented design approaches.

Function-Oriented Software Design: Structured Analysis – Data Flow Diagrams (DFDs) – Extending DFD technique to make it applicable to real-time systems – Structured design – Detailed design.

Unit IV   **12 Hrs**

Object Modeling Using UML: Overview of basic object-orientation concepts – Unified modeling language (UML) – UML diagrams – Use case model – Class diagrams – Interaction diagrams – Activity diagrams – State chart diagrams – Postscript.

Coding and Testing: Coding – Software documentation – Testing – Unit testing – Black-Box testing – White-Box testing – Debugging – Program analysis tools – Integration testing – Testing object-oriented programs – System testing.

Unit V   **12 Hrs**

Software Reliability and Quality Management: Software reliability – Statistical testing – Software quality – Software quality management system – ISO 9000 – SEI Capability Maturity Model – Personal Software Process (PSP) – Six Sigma.

Computer Aided Software Engineering: Case and its Scope – Case Environment – CASE support in software life cycle.

Software Maintenance: Characteristics of Software Maintenance – Software reverse engineering – Software maintenance process models – Estimation of maintenance cost.

Software Reuse: Basic issues in any reuse program – A reuse approach – Reuse at organisation level.

Emerging Trends: Client-server software – Service-Oriented Architecture (SOA) – Software as a Service (SaaS).

Text Book:

Fundamentals of Software Engineering, Rajib Mall, 3rd Edition, 2009, PHI Learning Private Limited, New Delhi.

Unit V : Chapters 11, 12 (12.1 to 12.3), 13, 14 (14.3 to 14.5), 15

Reference Books:
1. Software Engineering, Roger S. Pressman, 7th Edition, McGraw-Hill International Edition, 2010.
2. Software Engineering, Dr. Ashok Kumar, Anil Kumar, Vayu Education of India, First Edition, 2009.

Core 18   Database Management System

Contact Hours per Week: 5 Hrs
Contact Hours per Semester: 60 Hrs
Credits: 5   **Subject Code: P1CAC42**

Objectives:
➢ Able to do Database programming using both native and embedded ANSI-standard Structured Query Language (SQL).
➢ Able to know data definition language, data manipulation language, data control language
➢ Able to describe database queries reporting, query optimization, and Views
➢ To create small client server applications ,
➢ To know E R diagrams and design of databases and use features for Recovery, Concurrency and Security in DBMS.

Unit I   **12 Hrs**
 Introduction: Database System Applications-Purpose of Database Systems-View of Data-Database languages-Relational Databases-Database Design-Object –Based and Semistructued Databases-Data Storage and Querying-Transaction Management-Data Mining and Analysis-Database Architecture and Administrator-History of Database Systems.
 Relational Model: Structure of Relational Databases-Fundamental of Relational-Algebra Operations-Additional Relational-Algebra Operations-Extended Relational-Algebra Operations-Null Values-Modification of the Database.
 SQL: Background-Data Definition-Basic Structure of SQL Queries-Set Operations-Aggregate Functions-Null Values-Nested Sub queries-Complex Queries-Views-Modification of the Database-Joined Relations.
Other Relational Languages: The Tuple Relational Calculus-The Domain Relational Calculus-Query-By-Example-Data log.

Unit II   **12 Hrs**
Database design and   the E-R Model: Overview of the Design Process-The Entity -Relationship Model-Constraints- Entity –Relationship Diagrams- Entity –Relationship Design Issues-Weak Entity-Extended E-R Features-Database Design and Banking Enterprise-Reduction to Relational Schemas-Other Aspects of Database Design-The Unified Modeling Language.

Normalization of Database Tables: Database tables and normalization-The need for normalization-The normalization process-Conversion to First   Normal From(1NF)-Conversion to Second   Normal From(2NF)- Conversion to Third Normal From(3NF)-Improving the design-Surrogate key considerations-Higher Normal Form-The Boyce-Codd

Normal Form(BCNF)-Fourth Normal Form(4NF)-Normalization and Database Design-Denormalization

Unit III   **12 Hrs**
Application Design and Development: User Interfaces and Tools-Web Interfaces to Databases-Web Fundamentals-Servlets and JSP-Building Large Web Applications-Triggers-Authorization in SQL-Application Security.
Object-Based Databases: Overview-Complex Data Types-Structured Types and Inheritance in SQL-Table Inheritance-Array and Multiset Types in SQL-Object-Identity and Reference Types in SQL-Implementing O-R Features-Persistent Programming Languages-Object-Oriented Versus Object-Relational.
Unit IV   **12 Hrs**
Storage and File Structure: Overview of Physical Storage Media-Magnetic Disks- RAID-Tertiary Storage-Storage Access-File Organization-Organization of Records in Files-Data-Dictionary Storage.
Indexing and Hashing: Basic Concepts-Ordered Indices-B$^+$ Tree Index Files-Multiple-Key Access-Static Hashing-Dynamic Hashing-Comparison of Ordered Indexing and Hashing-Bitmap Indices-Index Definition in SQL.
Unit V   **12 Hrs**
Transactions: Transaction Concept-Transaction State-Implementation of Atomicity and Durability-Concurrent Execution-Serializability-Recoverability-Implementation of Isolation-Testing for   Serializability.
Concurrency Control: Lock -Based Protocols-Timestamp- Based Protocols-Validation Based Protocols-Multiple Granularity-Multiversion Schemas-Deadlock Handling-Insert and Delete Operations-Weak Level of Consistency-Concurrency   in Index Structures.
Recovery Systems: Failure Classification-Storage structure-Recovery and Atomicity-Log-Based Recovery-Recovery with Concurrent Transactions-Buffer management-Failure with Loss of Nonvolatile Storage-Advanced Recovery Techniques-Remote Backup Systems.

Text Books:
   1) Database System Concepts by Abraham Silberschatz ,Henry F.Korth,S.Sudarsan,
Fifth Edition, McGraw-Hill International Edition. 2006
            Unit I   : Chapter 1,2,3,5.
            Unit II   : Chapter 6.
            Unit III   : Chapter 8,9.
            Unit IV : Chapter 11,12.
            Unit V   : Chapter 15,16,17.

   2) Database System concepts by Peter Rob, Carlos Coronel, Publishing by Cengage Learning, First Edition 2008.

            Unit II :   Chapter 5

Reference Book:
   Database Management Systems by Alexis Leon and Mathews Leon, Leon Vikas Publishing, Chennai 2002.

Core 19 – Computer Networks

Contact Hours per week   : 5 Hrs
Contact Hours per Semester : 60 Hrs
Credits: 5   **Subject Code : P1CAC43**

Objectives:
 ➢ To introduce the students the functions of different layers.
 ➢ To introduce IEEE standard employed in computer networking.
 ➢ To make students to get familiarized with different protocols and network components.

UNIT I   **12 Hrs**
Introduction: Uses of computer network- Network hardware- Network software- OSI model- TCP/IP model-Comparison of OSI and TCP/IP model- Example Networks : X.25- Frame Relay - ATM- Ethernet - Wireless LANs.
The Physical layer: Bandwidth- Maximum data rate of a signal- Guided transmission media – Wireless Transmission – Communication satellites – The Mobile Telephone System. The Data Link Layer : Data Link Layer Design Issues - error detection and correction- Elementary data link protocols – sliding window protocols.

UNIT II   **12 Hrs**
The Medium Access Control Sublayer: The channel allocation problem- Multiple access protocols: ALOHA- CSMA- Collision free protocols- Limited contention protocols- Wavelength division multiple access protocols- Wireless LAN protocols- Ethernet: Ethernet Cabling – Manchester Encoding – Binary Exponential Backoff Algorithm - Switched Ethernet- Fast Ethernet- Gigabit Ethernet - BlueTooth : Architecture – Protocol Stack – Radio, BaseBand,L2CAP Layer, Frame Structure - Data link layer switching: Bridges- Local internetworking-Spanning tree bridges- Remote Bridge- Repeaters- Hub- Switches- Routers- Gateway-Virtual LANs.

UNIT III   **12Hrs**
The Network Layer: Network Layer Design Issues - Routing algorithms- Shortest path routing- Flooding- Distance vector routing- Link state routing hierarchical routing- Broadcast routing- Multicast routing- Routing for mobile host- Routing in ad-hoc network- Congestion control algorithms- Internetworking - The network layer in the internet: The IP protocol- IP addresses- Internet control protocol- OSPF- BGP- Internet multicasting- Mobile IP - IPv6.

UNIT IV   **12Hrs**
The Transport Layer: The transport service: Services provided to the upper layers- Transport service primitives- Socket- Elements of transport protocols Addressing- Connection establishment- Connection release- Flow control- Multiplexing- Crash recovery- The transport protocol: UDP- Introduction to UDP – Remote Procedure Call – TCP : Protocol – Segment Header – Connection Establishment , Release – Modeling TCP Connection Management – Transmission policy – Congestion Control – Timer management.

UNIT V   **12Hrs**
The Application Layer:DNS: The DNS name space- Resource records- Name servers- Electronic mail: Architecture and services- The user agent- Message formats- Message transfer- Final delivery- World Wide Web: Architectural overview- HTTP.

Text Book:

Andrew S. Tannenbaum, "Computer Networks", PHI, Fourth Edition, 2003

UNIT I	Chapter 1 : 1.1 , 1.2 , 1.3, 1.4.1, 1.4.2, 1.4.3, 1.5.2, 1.5.3, 1.5.4
	Chapter 2 : 2.1.2 , 2.1.3 , 2.2 , 2.3 , 2.4 , 2.6
	Chapter 3 : 3.1 , 3.2 , 3.3 , 3.4
UNIT II	Chapter 4 : 4.1 , 4.2 , 4.3.1 , 4.3.2 , 4.3.4 , 4.3.6 , 4.3.7 , 4.3.8
	Chapter 4 : 4.6.1 , 4.6.3 , 4.6.4 , 4.6.5 , 4.6.6 , 4.6.7 , 4.7
UNIT III	Chapter 5 : 5.1 , 5.2.2 to 5.2.10
	Chapter 5 : 5.3 , 5.5 , 5.6
UNIT IV	Chapter 6 : 6.1 , 6.2 , 6.4.1 , 6.4.2 , 6.5.3 to 6.5.10
UNIT V	Chapter 7 : 7.1 , 7.2 , 7.3

Reference Books:

1. James .F. Kurouse & W. Rouse, "Computer Networking: A Topdown Approach Featuring", Pearson Education.
2. Larry L.Peterson & Peter S. Davie, "Computer Networks", Harcourt Asia Pvt. Ltd., Second Edition, 2000.
3. William Stallings, "Data and Computer Communication", Sixth Edition, Pearson Education, 2000.

Core 20 – Lab   Client Server Lab

Contact Hours per week   : 5 Hrs
Contact Hours per Semester: 60 Hrs
Credits: 3   Subject Code: P1CAC4P1
Objectives:
  ➢ To create small client server applications.
  ➢ To know the fundamental concepts of transaction processing.
  ➢ To know the use of socket controls.

SQL:
  1) Data Definition Language (DDL) Constraints.
  2) Data Definition Language (DDL) Commands.
  3) Data manipulation Language (DML) Commands.
  4) Query using Aggregate,Date,String Functions
  5) Correlated and Nested subquries.
  6) Join operations.

PL/SQL:

  7) Implement PL/SQL Program using control statements.
  8) Implement PL/SQL program using arrays.
  9) Implement PL/SQL Program using cursor
  10) Implement PL/SQL Program using Exception
  11) Implement PL/SQL Program using Triggers.

Visual Basic:

  12) Program to implement inventory control using Data control.

13) Program to implement Employee pay bill preparation using DAO.
14) Program to implement EB Bill Calculation using ActiveX Control.
15) Program to implement Telephone Bill calculation using Grid Control.
16) Generate Report.
17) Program to implement chatting using Winsock control.

Core 21 – Software Development Lab

Contact Hours per Week : 5 Hrs
Contact Hours per Semester : 60 Hrs
Credits : 3   **Subject Code : P1CAC4PV**

Objective:
  ➢ Able to develop practical ability and knowledge about practical tools / techniques in order to solve real life problems related to the industry, academic institutions and computer science research.
  ➢ To understand and solves problems in the field of computing.
  ➢ Students will select individually Commercial or Technical Project based on Application Development Technologies.
  ➢ With the known technologies they can develop the software.

Elective II Data Mining & Warehousing

Contact Hours per week   : 5 Hrs
Contact Hours per Semester : 60 Hrs
Credits: 5   **Subject Code : P1CAE41**

Objectives:
  ➢ To know more about the data mining Techniques
  ➢ To motivate the students to apply these techniques in their researches and their projects

Unit I
Data Mining: **12 Hrs**

Importance of Data Mining – on What kind of data ?Data Mining Functionalities – Classification of DataMining Systems – Data mining task primitives – Integration of Data Mining Systems with a database or data warehouse system-Major issues in Data Mining.
Data Preprocessing:
Importance of preprocessing – Descriptive Data Summerization -Data Cleaning – Data Integration and Transformation – Data Reduction – Discretization and Concept Hierarchy Generation.

Unit II   **12 Hrs**
Data Warehouse and OLAP Technology: An Overview
Data Warehouse definition – A multidimensional Data model – Data warehouse Architecture – Data warehouse Implementation – From data warehousing to data mining.
Data Cube Computation and Data Generalization:

Efficient methods for Data Cube Computation - Further Development of Data Cube and OLAP Technology – Attribute-Oriented Induction – An Alternative method for Data Generalization and Concept Description.

Unit III   12 Hrs
Mining Frequent Patterns, Associations and Correlations:

Basic Concepts and a Road map – Efficient and scalable Frequent Itemset Mining methods – Mining various kinds of association rules -From Association mining to correlation analysis- constraint based Association mining

Classification and Prediction:

Issues regarding classification and prediction – classification by decision tree induction – Bayesian classification – Rule based classification - classification by back propagation – support vector machines – Associative classification : classification by Association Rule Analysis – Lazy learners – oher classification methods – prediction – Accuracy & error measures – Evaluating the Accuracy of classifier or predictor- Ensemble methods – model selection.

Unit IV   12 Hrs
Cluster Analysis:

Importance of cluster analysis – Types of data in cluster analysis – A categorization of major clustering methods – partitioning methods – hierarchical methods – density based methods – grid based methods.

Mining Stream, Time-Series and Sequence Data

Mining Data Streams – Mining Time series data-Mining Sequence patterns in Transactional databases – Mining Sequence patterns in biological data.

Graph Mining, Social network analysis and multirelational data mining:

Graph Mining – Multirelational Data Mining.

UNIT V   12 Hrs
Mining Object, Spatial, Multimedia, Text and Web Data: Multidimensional Analysis and Descriptive Mining of Complex data objects –Spatial data mining –multimedia data mining – text mining – mining the World Wide Web.

Applications and Trends in Data Mining:

Data Mining Applications – Data Mining system products and research prototypes – Additional themes on data mining – social impacts of data mining– trends in data mining.

Text Book:

Data Mining: Concept and Techniques , 2nd Edition 2007 Jiawei Han and Micheline Kamber, Morga Kaufman publishers , San Francisco, USA ,

Unit I Chapter 1.1,1.3,1.4,1.7-1.9,2.1-2.4,2.6
Unit II Chapter 3.1-3.5,4.1-4.3
Unit III chapter 5.1-5.5,6.1 to 6.15
Unit IV chapter **7**.1-7.7,8.1-8.4,9.1,9.3
Unit V chapter 10.1-10.5,11.1-11.5

Reference Books:

1.Data Mining Techniques , Timely Michael, J.A.Berry &Gordon S.Linoff Wiley India Edition,2008,Ansari Road, New Delhi
2. Decision Support and Data warehouse systems Efrem G.Mallach, University of Massachusetts at Lowell, Tata McGraw-Hill Edition,2008
3. Data Mining methods & models, Daniel T.Larose, Wiley Edition India 2007, Ansari Road , NewDelhi.
4.Data Mining, Margarnet H.Duhham, Dbrling Kindersley(India) Pvt Ltd.,2011 South Asia.

Elective II Artificial Neural Network

Contact Hours per week   : 5 Hrs
Contact Hours per Semester : 60 Hrs
Credits: 5   Subject Code : P1CAE42

Objectives:
➢ Able to know the fundamentals of artificial neural networks
➢ Able to know various algorithms and techniques
➢ Able to apply those algorithms and techniques in their researches and their projects

Unit I   12 Hrs
Introduction: Why artificial neural networks? Characteristics of artificial neural networks – learning – generalization – abstraction – applicability – historical perspective –ariticificial neural networks in the present day environment - prospects for the future –
Aritificial neural networks and expert systems – reliability considerations.
Fundamentals of artificial neural networks: Biological prototype, artificial neuron- single layer artificial neural networks – multi layer artificial neural networks – different terminologies in artificial neural networks – training of artificial neural networks.

Unit II   12 Hrs
Perceptrons: perceptron representation – Linear separability – overcoming of linear separability – perceptron learning algorithm –problems with perceptron learning algorithm.
Backpropagation: Introduction to back propagation – propagation training algorithms – advanced algorithms – caveats – network paralysis –temporal instability
Counter propagation networks: Introduction to counter propagation networks – kohonen layer –initializing the weight vectors – statistical properties of trained network – application of counter propagation networks.

Unit III   12 Hrs
Statistical methods: Training applications – boltzman training – Cauchy training – applications to general non linear optimization problems – back propagation and caughy training – combined caughy and backpropagation training .
Hopfield nets:
  Recurrent network configurations –stability – continuous systems - Hopfield nets and boltzmann machine – thermodynamic systems .
Bidirectional associative memories: BAM and its types.
Adaptive Resonance Theory: A simplified ART structure – ART implementation – Theorems of ART.

Unit IV   12 Hrs

Optical neural network: Vector matrix multipliers – Hopfield net using Electro optical matrix multipliers – Holographic correlators –volume holograms – An optical Hopfield net using volume holograms – optical neuron.

Unit V   12 Hrs
The cognitron and neocognitron: The cognitron – structure –Training –Excitatory neuron – the inhibitory neuron –the neocognitron –generalization –training – training implementation – Biological neural network –organization of the human brain – the neuron –computers and the human brain –Vector and Matrix operations –Training algorithms.

Text Book:
Neural Computing Theory and Practice – Philip D.Wasserman, Van Nostrand ReinHold, New Delhi, 1989

Unit I - Introduction , chapter 1
Unit II - chapter 2 ,3, 4
Unit III – chapter 5,6,7,8
Unit IV – chapter 9
Unit V – chapter 10 & Appendix 1, 2, 3
Reference Books:
1.Artificial Neural Networks – Robert J.Schalkoff,Tata McGraw Hill edition 2011
2.Neural networks in computer intelligence Limin Ju,   Tata McGraw Hill edition,2010
3.Neural network fundamentals , Graph algorithms & applications, N.K.Bose,P.Liang
  Tata McGraw Hill edition,1996

Elective II   Parallel Programming
Contact Hours per week   : 5 Hrs
Contact Hours per Semester: 60 Hrs
Credits: 5   **Subject Code : P1CAE43**
Objectives:
  ➢ Able to know that large problems can often be divided into smaller ones, which are then solved concurrently
  ➢ To illustrate the limit of difficulty and overhead of parallel software design and maintenance, it is crucial that parallel programming models
  ➢ To allow the students an easy-to-understand, concise and dense representation of parallelism.

Unit I   12 Hrs
Introduction: Why Parallel Processing? – Warnings – Laws of Caution? – Parallel Processing – Shared Memory Multiprocessing – Distributed Memory – Using Parallelism – Tools and Languages – Is It Practical?
Parallel Processing Architectures: Introduction – Parallelism in Sequential Machines – Abstract Model of Parallel Computer – Multiprocessor Architecture – Pipelining – Array Processors.
Programmability Issues: An Overview – Operating System Support – Types of Operating Systems – Parallel Programming Models – Software Tools.
Data Dependency Analysis: Introduction – Types of Dependencies – Loop and Array Dependence Analysis - Solving Diophantine Equations – Program Transformations.

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Unit II	**12 Hrs**

Shared Memory Programming: Shared Memory Programming – General Model of Shared Memory Programming – Process Model under UNIX.

Thread-based Implementation: Introduction – Thread Management – Example with Threads – Attributes of Threads – Mutual Exclusion with Threads – Mutex Usage of Threads – Thread Implementation – Events and Condition Variables – Deviation Computation with Threads – Java Threads.

Distributed Computing – I: Message Passing Model: Message Passing Model – General Model – Programming Model – PVM.

Unit III	**12 Hrs**

Distributed Computing – II: Remote Procedure Call: Parameter Passing – Locating the Server – Semantics in the Presence of Failures – Security – Problem Areas – Java Remote Method Invocation – DCE – Developing Applications in DCE.

Algorithms for Parallel Machines: Speedup, Complexity and Cost – Histogram Computation – Parallel Reduction – Quadrature Problem – Matrix Multiplication - Parallel Sorting Algorithms – Solving Linear Systems – Probabilistic Algorithms – Is Superlinear Speedup Possible?

Unit IV	**12 Hrs**

Parallel Programming Languages: Sample Problem – FORTRAN 90 – nCUBE C – Occam – C-Linda.

Debugging Parallel Programs: Introduction – Debugging Techniques – Debugging Message Passing Parallel Programs – Debugging Shared Memory Parallel Programs.

Other Parallelism Paradigms: Introduction – Dataflow Computing – Systolic Architectures – Functional and Logic Paradigms – Distributed Shared Memory.

Unit V	**12 Hrs**

Distributed Data Bases: Why Distributed Databases? – Objectives – Issues – Systems – Distribution Options – Database Integrity – Concurrency Control – DDBMS Structure.

Distributed Operating Systems: Why Distributed Operating Systems? – Network Operating Systems – Distributed OS – DOS: Goals – Design Issues – Amoeba.

Text Book:

Introduction to Parallel Processing, M. Sasikumar, Dinesh Shikhara and P.Ravi Prakash, Printice-Hall of India Private Limited, New Delhi, First Edition, 2000.

Unit I	:	Chapter 1, 2, 3, 4
Unit II	:	Chapter 5, 6, 7
Unit III	:	Chapter 8, 9
Unit IV	:	Chapter 10, 11, 12
Unit V	:	Chapter 13, 14

Reference Book:

Parallel Computing Theory and Practice, Michael J. Quinn, Tata McGraw-Hill Publishing, 2nd Edition, 2002, New Delhi.

Course Name: Bachelor of Science

Discipline   : Microbiology

Semester	Part	Subject	Hour	Credit	Marks Int+Ext	Total	Subject code	Revision
III	Part I	Tamil/Hindi	6	3	25+75	100	U1PT31/ U1PH31	Revised
	Part II	English	6	3	25+75	100	U1PE31	Revised
	Core 5	Immunology	4	4	25+75	100	U1MBC31	Revised
	Core 6 Lab	Major Practical II	2	--	--	--	---	--
	Allied 5	Chemistry	4	4	25+75	100	U1CHA3X3	Revised
	Allied 6 Lab	Chemistry	2	--	--	--	---	-
	Allied 7	Biology – Plant Science	4	2	25+75	100	U1MBA31	New
	Allied 8 Lab	Biology	2	--	--	--	---	-

Semester	Part	Subject	Hour	Credit	Marks Int+Ext	Total	Subject code	Revision
IV	Part I	Tamil/Hindi	6	3	25+75	100	U1PT41/ U1PH41	Revised
	Part II	English	6	3	25+75	100	U1PE41	Revised
	Core 7	Microbial Biochemistry	4	4	25+75	100	U1MBC41	New
	Core 8 Lab	Major Practical II	2	2	40+60	100	U1MBC4P1	New
	Allied 9	Chemistry	4	4	25+75	100	U1CHA4X	Revised
	Allied 10 Lab	Chemistry	2	2	40+60	100	U1CHA4PX	No Change
	Allied 11	Biology – Animal Physiology	4	2	25+75	100	U1MBA41	New
	Allied 12 Lab	Biology	2	2	40+60	100	U1MBA4P1	New

SYLLABUS FOR EACH PAPER:

Title of the paper: Immunology (Core-5)
Contact Hours per week: 4   **Contact Hours per semester: 60**   **Credits: 4**
Subject Code: UIMBC31
Objectives:
1. To enable the students to acquire knowledge in all the basic concept of Immunology.
2. To make the students to acquire applied knowledge in Transplantation and Cancer Immunology
3. To ensure awareness about all immunodeficiency diseases

UNIT-I   **(12 Hours)**
History of Immunology – types of immunity: innate immunity and adaptive immunity. Cells and organs of the immune system - Immune response: Humoral and Cell mediated.

Unit- II   **(12 Hours)**
Antigens: classes of antigen and their characteristics - Haptens. Structure, classification and characteristics of Antibody –Complement system: classical and alternative pathway.

Unit- III   **(12 Hours)**
General organization of MHC, classes of HLA and H-2 complex - Antigen processing and presentation: cytosolic and endocytic pathway.

Unit -IV   **(12 Hours)**
Hypersensitivity and its types- Autoimmune disease - organ specific (Graves disease) and systemic (Rheumatoid arthritis) - Immune tolerance. Transplantation: types of graft rejection.

Unit -V   **(12 Hours)**
Immunotechniques: Precipitation reactions, Agglutination reactions, Radioimmunoassay, ELISA, Western blotting.

Text books
Unit I
1. Madhavee latha, 2012. A text book of Immunology. Chand publications
2. Goldsby, Kindt, Osborne and Janis kuby.2003.immunology, fifth edition. W.H.Freeman and company, newyork

Unit II
1. Dubey and Maheshwari. 2006. A text book of Microbiology. Chand publications
2. Goldsby, Kindt, Osborne and Janis kuby. 2003. Immunology, fifth edition. W.H.Freeman and company, Newyork

Unit III
1. Tizarrd. I.R. 2004. Immunology an Introduction II Ed. Thomson Asia Pvt. Ltd
2. Goldsby, Kindt, Osborne and Janis kuby. 2003. Immunology, fifth edition. W.H.Freeman and company, Newyork

Unit IV
1. Poul, W.E. 1990. Fundamental of Immunology II Ed. Ravar Press, New York.
2. Goldsby, Kindt, Osborne and Janis kuby. 2003. Immunology, fifth edition. W.H.Freeman and company, Newyork

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Unit V
1. Dubey and Maheshwari. 2006. A text book of Microbiology. Chand publications
2. Goldsby, Kindt, Osborne and Janis kuby. 2003. Immunology, fifth edition. W.H.Freeman and company, Newyork

Reference books
1. Roitt.1998. Essentials of immunology. Blackwell scientific publications.
2. Goldsby, Kindt, Osburne and Janis Kuby. 2003. Immunology, Fifth edition, W.H.Freeman & company, New York.
3. Talwar G.P. and Gupta S.K. 1992. A Hand Book of practical Immunology (Volume I & II), Vikas publishing House Pvt. Ltd. New Delhi.
4. Donald M. Weir, John Steward , 1993. Immunology VII Ed. ELBS, London.
5. Bellanti, J.A.1985. Immunology (3rd edition), W.B.Saunders Co Ltd. Philadelphia

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Title of the paper: Plant science (Allied-7)
Contact Hours per week: 4   **Contact Hours per semester: 60**   **Credits: 2**
Subject Code: UIMBA31

Objectives:
1) To develop basic knowledge of plants.
2) To guide them towards natural medicines for the treatment of some diseases.
3) To improve the interest towards the environment& plant cultivation.

Unit-I   **(12 Hours)**
Basics of classification: Species, Genus, Family, Nomenclature-Binomial system. Systems of classification (upto order level) - Artificial (Linnaean system of classification) Natural (Bentham& Hooker system of classification) and Phylogenetic system of classification (Engler and Prantle).

Unit-II   **(12 Hours)**
General features and classification up to class level for algae (Fritch), fungi (Alexopolas & Mims). Algae: structure and reproduction of *Chlamydomonas*, *Sargassum.* Fungi: structure and reproduction of *Yeast*, *Agaricus* – Economic importance of algae and fungi.

Unit-III   **(12 Hours)**
General characters of Bryophytes and Pteridophytes. Bryophytes: structure and reproduction of *Riccia, Funaria*. Pteridophytes: structure and reproduction of *Selaginella.*

Unit-IV   **(12 Hours)**
General characters of Gymnosperms. Gymnosperms: structure and reproduction of *Pinus and Cycas*. Economic importance of gymnosperms. Angiosperm: Description of a typical monocot (*Allium cepa*) and dicot (*Tribulus terrestris*) flowers.

Unit-V   **(12 Hours)**
General features of lichens, Type study-*Usnea*. Economic importance of lichens. Medicinal importance of plants (Tulsi, Neem, Turmeric, Ginger and Pepper).

Text books
Unit-I
1) Subhash Chandra datta. A hand book of systematic botany-Asia publishers.

2) HIrenra Chandra gangulee. College botany-New central book agency.

Unit-II
1) B.P.Pandey. The algae- S.Chand & company.
2) B.R.Vasishta. Algae - S.Chand & company.
3) B.P.Pandey. A text book of botany-Fungi- S.Chand & company.
4) S.Gupta. Text book of fungi-Oxford & IBH publishing pvt ltd.

Unit-III
1) V.Venkateswarlu – Bryophyta - Educational publishers.
2) Kogakusha-Cryptogamic botany-Vol-I. Bryophytes & Pteridophytes.
 3) P.C.Vasishta-Vascular cryptogams: Pteridophytes- S.Chand & company

Unit-IV
1) HIrenra Chandra gangulee. College botany- New central book agency.
2) P.C.Vasishta.Taxonomy of angiosperms - S.Chand & company
3) V.Venkateswarlu.Angiosperms- S.Chand & company.

Unit-V
1) V.Verma. A text book of economic botany- Emkay publications.
2) Aibert F.Hill. Economic botany - Tata Mc Graw Hill. Publishing company Ltd.

References:
1. A.C.Dutta: Botany for degree students, Oxford university press.
2. G.M.Smith: Cryptogamic botany, vol.I & II, Tata Mc Graw Hill.
3. Outlines of botany- Narayasamy et al - Viswanathan (Printers & Publishers ltd).
4. W.T.Tailor and R.J.Wehe: General biology, East west press pvt ltd.

Title of the paper: Microbial Biochemistry (Core-7)
Contact Hours per week: 4   Contact Hours per semester: 60   Credits: 4
Subject Code: UIMBC41
Objectives:
1. To enable the students to know about all the structure, properties and metabolism of biomolecules
2. To make the students to understand about the concept of Buffers and Bioenergetics
3. To enable the students to become familiar with enzyme kinetics, inhibition and regulation

Unit-I (12 Hours)
pH: acid and bases, pH scale and Measurement. Buffers: Physiological importance (Phosphate and Bicarbonate buffer system). Bioenergetics: law of thermodynamics and free energy concept.

Unit-II (12 Hours)
Carbohydrates and its metabolism: classification, biological significance and structure of glucose, lactose, starch. Glycolysis, Citric acid cycle, HMP shunt, Gluconeogenesis.

Unit-III (12 Hours)
Protein: Structure (primary, secondary, tertiary and quaternary), classification and properties of proteins. Amino acid: Properties of aminoacids. Enzymes: nomenclature and classification.

Unit-IV (12 Hours)
Lipids: classification, properties and biological roles of lipids: Triglycerides, Waxes, Phospholipids and steroids – oxidation of fatty acids (beta oxidation).

Unit-V (12 Hours)

Nucleic acid: structure, types, nucleosides, nucleotides, DNA and RNA (rRNA, tRNA, mRNA) – Comparison between DNA and RNA.

Text books
Unit I
1. Campell. 1999. Biochemistry Third edition. Saunders college publishing
2. Narayanan. 2006. Biochemistry. Saras publication.

Unit II
1. Renuka Harekrishnan. 2000. An introduction to Biomolecules and enzymes. Indraji pathippagam
2. Narayanan. 2006. Biochemistry. Saras publication.

Unit III
1. J.L.Jain, 2012,Fundamentals of Biochemistry, first edition. S. chand & company LTD, New delhi.
2. Renuka harekrishnan. 2000. An introduction to Biomolecules and enzymes. Indraji pathippagam

Unit IV
1. J.L.Jain, 2012,Fundamentals of Biochemistry, first edition. S. chand & company LTD, New delhi.

Unit V
1. Narayanan. 2006. Biochemistry. Saras publication.

Reference books
1. Lehninger. 1993. Principles of Biochemistry. CSB publishers
2. Voet and Voet. 1990. Biochemistry. John wiley&sons. NewYork
3. Stryer. 1998. Biochemistry. W.H. freeman and Company. NewYork
4. Zubay. 1998. Biochemistry. Mcmillan publisher NewYork. Collier Mcmillan company publishers. London

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Title of the paper: Major Practical II (Core-6 & 8)
Contact Hours per week: 2   **Contact Hours per semester: 30**   **Credits: 2**
Subject Code: UIMBC4P1
Practicals
Immunology
1. Separation of serum and plasma
2. Blood cell count: RBC count and WBC count
3. Blood typing: ABO, Rh
4. Agglutination tests: Widal test
5. Precipitation: Ouchterlony's double immunodiffusion

Biochemistry
6. Determination of pKa values.
7. Determination of pH and Preparation of Buffers
8. Estimation of carbohydrates by Anthrone method
9. Estimation of proteins by Lowry method
10. Separation of aminoacids by paper chromatography.

Title of the paper: Animal Physiology (Allied-11)
Contact Hours per week: 4   Contact Hours per semester: 60   Credits: 2
Subject Code: UIMBA41
Objectives:

1) To develop basic knowledge about the types of animals.
2) To create awareness about the various systems in our body & their Significance.
3) To improve the notion of mechanism behind the physiological activities.
4) Enlight the students about the human Harmones & reproduction.

Unit-I   **(12 Hours)**

General characters and Classification of Invertebrates - Protozoa, Porifera, Coelenterata, Platyhelminthes, Aschelminthes, Annelida, Arthropoda, Mollusca and Echinodermata. General characters and Classification of Chordates - Pisces, Amphibia, Reptilia, Aves and Mammalia.

Unit-II   **(12 Hours)**

Digestive, respiratory, excretory and reproductive system of cockroach and frog.

Unit-III   **(12 Hours)**

Digestive, respiratory, excretory and reproductory system of Pigeon.

Unit-IV   **(12 Hours)**

Digestive system (various steps in digestion), respiratory system, excretory system of human. Circulatory system: composition of blood, organization of circulatory system in human.

Unit-V   **(12 Hours)**

Reproductive system in human – types and role of Endocrine harmones - Menstrual cycle.

Text books:

Unit-I

1. E.L. Jordan and P.S.Verma (1995) Invertebrate Zoology, S.Chand & co. New delhi.
2. E.L.Jordan and P.S.Verma (1995) Chordate Zoology, S.Chand & co.

Unit-II

1. E.Babsky et al. Human physiology - MIR publishers.
2. K.A.Goyal-Animal physiology - Rastogi publications.

Unit-III

1. J. Lee. Animal hormones - Hutchinson & co (publishers) Ltd.
2. K.A.Goyal-Animal physiology - Rastogi publications.
3. E.Babsky et al. Human physiology - MIR publishers.
4. Sambasivan et al, Animal physiology - S.Chand & co.

Unit-IV

1. P.G.Puranik, R.S.Thakur. Invertebrate Zoology - S.Chand & co.
2. E.L.Jordan and P.S.Verma (1995) Invertebrate Zoology, S.Chandra & co. New Delhi.
3. E.L.Jordan and P.S.Verma (1995) Chordate Zoology, S.Chand & co.

Unit-V

1. P.G.Puranik, R.S.Thakur. Invertebrate Zoology- S.Chand & co.
2. E.L.Jordan and P.S.Verma (1995) Invertebrate Zoology, S.Chand & co. New Delhi.

References:

1. E.L. Jordan and P.S.Verma (1995) Invertebrate Zoology, S.Chand & co. New Delhi.
2. E.L. Jordan and P.S.Verma (1995) Chordate Zoology, S.Chand & co. New Delhi.
3. K.A.Goyal- Animal physiology - Rastogi publications.
4. W.T.Tailor and R.J.Wehe: General biology, Eastwest press pvt ltd.
5. A.J.Grove - Animal biology - University tutorial press ltd.

Title of the paper: Biology Practical-1 (Allied- 8 & 12)
Contact Hours per week: 2   Contact Hours per semester: 30   Credits: 2
Subject Code: UIMBA4P1

Botany

1. Vegetative structure and reproductive structure in *Sargassum*, *Yeast, Funaria, Selaginella* and Pinus (section cutting of *Sargassum, Selaginella* and Pinus needle.
2. Disscection and study of any monocot flower.
3. Disscection and study of any dicot flower.

Zoology

1. Morphology of one representative for each phylum- (spotters only)- *Amoeba, Hydra, Planaria, Taenia, Ascaris,* Earthworm, Prawn, Pila, Star fish, Shark, Mugil, Bufo, Calotes, Pigeon, Rat.
2. Cockroach - External, digestive, reproductive system.
3. Frog - External, digestive, reproductive system.
4. Determination of haemoglobin.
5. Estimation of urine sugar (Benedict method).
6. Blood cells of man - Slide only

Course Name: Master of Science
Discipline   : Microbiology

Semester	Part	Subject	Hours	Credit	Int+Ext =Total	Subject code	Revision
III	Core 11	Immunology	5	4	25+75=100	P1MBC31	Inter Changed and Revised
	Core 12	Genetic Engineering	5	4	25+75=100	P1MBC32	Revised
	Core 13	Fermentation Technology	5	4	25+75=100	P1MBC33	Inter Changed and Revised
	Core 14Lab	Lab: Immunology & Fermentation Technology	5	3	40+60=100	P1MBC3P1	New
	Core 15Lab	Lab: Genetic Engineering	5	3	40+60=100	P1MBC3P2	New
	Elective 2	Bioinformatics	5	5	25+75=100	P1MBE31	New

Semester	Part	Subject	Hours	Credit	Int+Ext =Total	Subject code	Revision
IV	Core 16	Research Methodology	5	4	25+75=100	P1MBC41	Revised
	Elective 3	Food & Dairy Microbiology	5	5	25+75=100	P1MBE41	New
	Core 17	Project	20	12	40+60=100	P1MB4PV	No Change

SYLLABUS FOR EACH PAPER:
Title of the paper: Immunology (Core-11)
Contact Hours per week: 5   Contact Hours per semester: 75   Credits: 4
Subject Code: P1MBC31
Objectives

1. To clinically diagnose, investigate and manage a whole spectrum of immune-mediated disorders.
2. To Practically perform and interpret the common laboratory techniques used in the Immunology Laboratory
3. To Plan and undertake research in Clinical Immunology in the clinic, laboratory and community

Unit-I   **(15 Hours)**
        History of immunology- Types of immunity: Innate and adaptive; passive and active – Cells and organs of immune system- Physiology of immune response: Humoral and cell mediated immunity – Antigens - Immunogenicity versus antigenicity – factors that influence immunogenicity- Epitopes, haptens and adjuvants.
Unit-II   **(15 Hours)**

Antibodies : structure, Classes and biological activities – theories of antibody production; complement pathways and biological consequences of complement activation; Hybridoma technology- monoclonal antibodies and its uses- lymphokines and cytokines - Properties of cytokines and role of cytokines in Hematopoiesis.

Unit -III **(15 Hours)**

Antigen Processing and presentation: endogenous and exogenous antigens. Antigen – Antibody reaction: Principles and application, Cross-Reactivity. Hypersensitivity recations – Type I, Type II, Type III and Type IV. Immune response to diseases – Viral (HIV), Bacterial (Tuberculosis) and Protozoan (Malaria).

Unit -IV **(15 Hours)**

Structure and functions of MHC and HLA system. Transplantation immunology: Rejection - Graft versus Host rejection - Transplantation antigen - Tumour immunology - Tumor antigens – Autoimmunity: Organ specific Autoimmune diseases and Systemic Autoimmune Diseases.

Unit- V **(15 Hours)**

Immunohaematology - blood groups, blood transfusion and Rh incompatibility. Immunotechniques: Precipitations, Agglutination, RIA, ELISA, Western Blotting. Vaccines – Types and applications. Reproductive Immunology : Immunology of Normal Pregnancy.

Text Books

Unit 1

1. Kuby J, 2003, Immunology, W.H. Freeman Co New York

Unit 2.

1. Roitt, J.M., Brostaff, J.J. 2004, Immunology (7th edition), C.V. Mosby Publisher, St.Louis, USA

Unit 3

1. Coleman, R.M. Lambard, M. F.and Siccard , 1992, Fundamental of Immunology II Ed.

Unit 4

1. Poul, W.E. 1990, Fundamental of Immunology II Ed. Ravar Press, New York.

Unit 5

1. Tizarrd. I.R. 2004, Immunology an Introduction II Ed. Thomson Asia Pvt. Ltd
2. Kuby J, 2003, Immunology, W.H. Freeman Co New York
3. The immunology of successful pregnancy A.L. Veenstra van Nieuwenhoven, M.J. Heineman and M.M. Faas *Hum. Reprod. Update (2003) 9 (4): 347-357.* http://humupd.oxfordjournals.org/content/9/4/347.full.pdf+html.

References

1. Kuby J, 2003, Immunology, W.H. Freeman Co New York
2. Huw Devies, 1997, Introductory Immunology (1st Edition), Chapmen & Hall Publisher London.
3. Roitt, J.M., Brostaff, J.J. 2004, Immunology (7th edition), C.V. Mosby Publisher, St.Louis, USA
4. Bellanti, J.A.1985. Immunology (3rd edition), W.B.Saunders Co Ltd. Philadelphia
5. Talwar G.P. and Gupta, S.K. 1992. A Hand Book of practical Immunology (Volume I & II), Vikas publishing House Pvt. Ltd. New Delhi.
6. Chapel, H. and Halbey, 1986. Essentials of clinical Immunology, ELBS London.
7. Donald M. Weir, John Steward , 1993. Immunology VII Ed. ELBS, London.
8. Hue Davis, 1997. Introductory Immunology, Champman and Hall Publisher.
9. Peter, J Delves, Ivan M. Roit Ed, 1998. Encyclopedia of Immunology II Ed.Acad, Press.

10. Ridklad, M. Aydl, 1995. Immunology II Ed. Baltimore, Hangkang, NMS Pub.
11. Janeway, C. 2004. Immunology VI ED, Garland Science. New Yark.

Title of the paper: Genetic Engineering (Core-12)
Contact Hours per week: 5   Contact Hours per semester: 75   Credits: 4
Subject Code: PIMBC32
 Objectives
 1. To improve the knowledge on recombinant DNA technology and applications in advanced Molecular Biology research.
 2. To gain information on tools involved in genetic manipulation of organisms

UNIT-I **(15 Hours)**
        Scope of genetic engineering - Restriction enzymes (Type I, II and III) - role of Ligases, Alkaline phosphatase, Polynucleotide kinase, Terminal nucleotidyl transferase, DNA Polymerases, Taq DNA polymerases, RNAse, Reverse transcriptase. Linkers, Adaptors & Homopolymer tailing.

UNIT-II **(15 Hours)**
        Cloning vectors- Plasmid vectors: pBR322 and pUC19. Bacteriophages vectors - M13 vector and Lambda vector. Phagemids, Cosmids, Shuttle vectors. Artificial chromosomes - YACs, BACs, and HACs - Gene Library construction, Screening of gene library.

UNIT – III **(15Hours)**
        Expression strategies for heterologous genes - expression in bacteria. Processing of recombinant proteins - Purification and refolding, characterization of recombinant proteins. SAGE (Serial Analysis of Gene Expression).

UNIT-IV **(15 Hours)**
        Selection and screening of recombinants, Insertional inactivation - genetic complementation and hybridization - Site-directed mutagenesis, Phage Display, Analyzing DNA - PCR, inverse PCR, RT-PCR and Microarray analysis.

UNIT-V **(15 Hours)**
        Applications of r-DNA Technology in medicine (Insulin), Recombinant vaccines. Introduction to Gene therapy (Ex vivo & In vivo), Transgenic animals (Cattle and Fish), Transgenic plant (Herbicide tolerance), Antisense RNA technology.

TEXT BOOKS:
For All UNITS
1. Old RW, Primrose SB, Principles of Gene manipulation, An introduction to Genetic engineering, Blackwell Scientific Publications, 1993
2. T.A. Brown, Gene Cloning.
3. An introduction to Genetic Engineering (Second Edition) by Desmond S.T. Nicholl (Studies in Biology Series) I South Asian Edition 2002. Cambridge University Press
4. Cell and Molecular Biology 2nd edition by P.K. Gupta, Rastogi Publications
5. Molecular Cell Biology – Gerald Carp.
6. Gene Biotechnology. Jogdand (2000).
7. Recombinant DNA technology. (2002) Watson &Click
References:

1. Mickloss D.A and G.A.Greyer (1990) DNA Science - A First Course in Recombinant Technology, Cold Spring Harbor Laboratory Press, New York.
2. Primrose, S.B (1994) Molecular Biotechnology (2nd Edi). Blackwell Scientific Publishers, Oxford.
3. Davis J.A. and W.S.Roznikolf (1992) Milestones in Biotechnology. Classic papers on genetic Engineering, Butterworth-Helnemann, Boston.
4. Walker M.R. and R.Repley (1997) Route Maps in Gene Technology Blackwell Science Ltd., Oxford.
5. Kingsman S.M. and A.J.Kingsman, (1998) Genetic Engineering. An Introduction to gene analysis and exploitation in eukaryotes. Blackwell Scientific Publications, Oxford.
6. James D. Watson. Recombinant DNA (2001). Scientific American Books. USA
7. Glick, B Pasternak, J.J (2007) Molecular Biotechnology. ASM Press, Washington.
8. Benjamin Lewin. Genes-VIII. Oxford University Press.
9. Glover, D.M and B.D Hames. DNA cloning 1-4 (2006) Oxford University Press.
10. Mark Schena (2002) Microarray Analysis. 1st Edition. John Wiley & Sons Ltd.

Title of the paper: Fermentation Technology (Core-13)
Contact Hours per week: 5   Contact Hours per semester: 75   Credits: 4
Subject Code: PIMBC33

Objectives:
1. To provide the knowledge of basic principle of fermentation process, which help students to design, develop and operate industrial level fermentation process.
2. To create interest in industry based on bioprocess.
3. To provide the knowledge in upstream processing including the selection, preparation of media and design of bioreactors Batch, Fed batch and perfusion models and production of related products.

UNIT-I   **(15 Hours)**
Introduction to fermentation technology- Screening of industrial microorganisms: Primary and Secondary screening- Various media for industrial fermentation process- Storage and maintenance of microbes- Strain development: Mutagenesis - Detection and assay of fermentation products- Inoculum development

UNIT-II   **(15 Hours)**
Design of fermentor- Types of fermentor: Batch, Fed batch, Continuous stirred tank fermentor and Tower fermentor- Types of fermentation: Batch, Fed batch and Continuous fermentation- Submerged and solid state fermentation.

UNIT-III   **(15 Hours)**
Fermentation kinetics- Factors affecting kinetics- Mass transfer diffusion- Newtonian and Non-Newtonian behavior- KLA determinations- Renold number- Power number- Dimensionless number- Computer control of fermentation process.

UNIT-IV   **(15 Hours)**
Industrial fermentation process: Alcoholic fermentation process: Beer, Wine and Ethanol- Antibiotic fermentation: Penicillin- Organic acids: Citric acid and Acetic acid- Amino acids: Glutamic acid- Vitamins: B12- Hormones: IAA- Enzyme: Amylase and protease - SCP.

UNIT-V   **(15 Hours)**

Down stream processing: Flocculation and flotation, Ultra filtration, Centrifugation, Cell disruption and Liquid- liquid extraction- Chromatography: Gel filtration, Adsorption, Ion exchange and affinity- Product extraction, crystallization and drying- Immobilization methods and its applications.

Text Books:
Unit: I
1. Patel. A.H. Industrial Microbiology. Publised by Macmillan india limited
2. Casida. Industrial microbiology

Unit: II
1. Patel. A.H. Industrial Microbiology. Publised by Macmillan india limited
2. Sathyanarayana. Biotechnology

Unit: III
1. Crueger, W. and A. Crueger. Biotechnology, A text book of industrial Microbiology, Panima publishers, New Delhi

Unit: IV
1. Patel. A.H. Industrial Microbiology. Publised by Macmillan india limited
2. Casida. Industrial microbiology

Unit: V
1. Crueger, W. and A. Crueger. Biotechnology, A text book of industrial Microbiology, Panima publishers, New Delhi
2. Patel. A.H. Industrial Microbiology. Publised by Macmillan india limited

References:
1. Crueger, W. and A. Crueger. Biotechnology, A text book of industrial Microbiology, Panima publishers, New Delhi
2. Reed, G. Prescott and Dunn's Industrial Microbiology, CBS Publishers and distributers, New Delhi
3. Stanbury, O.F., Whitaker, A, and hall, S.J., Principles of fermentation technology, Aditya Books (P) Ltd, New Delhi.

Title of the paper: Lab: Immunology & Fermentation Technology (Core-14 Lab)
Contact Hours per week: 5   Contact Hours per semester: 75   Credits: 3
Subject Code: P1MBC3P1
Immunology Practicals
1. Agglutination test for ABO blood grouping and Rh typing
2. Oucheterlony Double Diffusion test for the pattern of Ag and Ab reaction
3. Rocket immuno electrophoresis for the Ag and Ab reaction
4. Widal tube and Slide test for diagnosis of Typhoid.
5. RPR, RA and Pregnancy
Fermentation Technology Practicals
6. Immobilization technique using Yeast
7. Solid state fermentation- Production of Enzyme protease
8. Ethanol production by Yeast
9. Amylase enzyme production by Submerged fermentation using *A.niger*

Title of the paper: Lab in Genetic Engineering (Core-15 Lab)
Contact Hours per week: 5   Contact Hours per semester: 75   Credits: 3

Subject Code: P1MBC3P2

1. Isolation of Chromosomal DNA from bacteria and separation by Agarose gel electrophoresis
2. Isolation of Plasmid DNA from bacteria and separation by Agarose gel electrophoresis
3. Restriction Digestion of Plasmid DNA – Single and Double digestion.
4. DNA Ligation.
5. Cloning of DNA Fragment in pUC18/Blue white selection assay
6. PCR amplification of DNA.
7. RAPD analysis of DNA.

Reference Books

1. Short protocols in Molecular Biology II edition, John Wiley & Sons by Fredrick M. Anusbel, Harvard Medical School.
2. Lab - Molecular Biology. Gene analysis II edition- T. A. Brown
3. DNA Cloning –A Practical Approach Vol 4, by Glover and B.D. Hames, IRL Press, 1995.
4. Molecular cloning –A lab manual II edition , Sambrook, Fritsh Maniatis, CSH Press,

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Title of the paper: Bioinformatics (Elective-2)
Contact Hours per week: 5   Contact Hours per semester: 75   Credits: 5
Subject Code: PIMBE31
Objectives

1. To enable the students to understand the basics of computer and Internet search engine for their studies.
2. To enable the students to use the bioinformatics tools on biomolecules.
3. To enable the students to understand the gene sequence methods, biological sequence databases and phylogenitic tree construction.

Unit- I **(15 Hours)**

Introduction to computer: Basics and generations of computers - overview of functions of components of computers: input/output devices, storage devices, graphics devices; functions of hardware and software - Internet, Intranet, LAN, UTP, Ethernet, Fiber Optics, TCP/IP, URL, WWW, Email.

Unit- II **(15 Hours)**

Biological Databases, an overview; Sequence Database- (NCBI/PIR, SWISS-PROT, DDBJ, EMBL, GenBank Database (GDB), Sp-TrEMBL, PROSITE, REBASE.

Unit -III **(15 Hours)**

Structural Databases: (PDB, CSD) - Other Databases (BMCD), Carbohydrate database, CUTG, BRENDA, EPD, Fly Base, Ligand, Metabolic database.

Unit- IV **(15 Hours)**

Nucleic acid and protein sequence analysis- Database search (BLAST and FASTA)- Sequence alignment: (Pair wise and Multiple).

Unit -V **(15 Hours)**

Phylogenetic analysis: Concept, methods of construction and Evaluation of phylogenic trees (Distance and character based). Phylogenic tree construction software (PHYLIP)

Text Books
Unit 1

1. The Internet and the new Biology: Tools for Genomics and Molecular Research by Peruski, Jr. and Peruske (ASM) 1997.

Unit 2
1. Krawetz, S.A & Womble, D.D. Introduction to Bioinformatics - A Theoretical and practical approach, Humana press, Totowa, NJ.

Unit 3
1. Attwood, T.K. and Parry – Smith, D.J. 1999. Introduction to Bioinformatics, Pearson Education Pvt. Ltd., Singapore.

Unit 4
1. Sundara Rajan, S. and Balaji, R. 2002. Introduction to Bioinformatics. Himalaya Publishing House, New Delhi.

Unit 5
1. Mount, DW. Bioinformatics- sequence and genome analysis. CBS publishers & distributors, New Delhi.

References
1. GCG User manual- Accelrys Inc. Japan.
2. Cozen S., Beginning Perl, http//learn.perl.org/library/begining_perl/
3. Tisdall J., 2001. Beginning Perl for Bioinformatics ISBN: 0-596-00080-4
4. Peek, Todino and Strang (O'Reilly, 2001) Learning the UNIX Operating system, fifth edition
5. Lesk, A.M. 2002. Introduction to Bioinformatics Oxford University Press, Oxford.
6. Baxevanis, A.D. and Quellette, B.F. 1998. Bioinformatics A Practical Guide to the Analysis of Genes and Proteins. Wiley-Interscience Publication, New York.
7. Smith, D.W. 1994. Biocomputing Informatics and Genome Projects. Academic Press, San Diego.
8. Gibas, C. and Jambeck, P. Developing Bioinformatics Computer Skills. Shroff Publishers, Calcutta.

Title of the paper: Research Methodology (Core-16)
Contact Hours per week: 5   Contact Hours per semester: 75   Credits: 4
Subject Code: P1MBC41
Objectives:
1. To familiarize the students with the concepts and the techniques of Research Methodology applicable to Applied Biological Sciences.
2. To develop the basic skills for becoming a researcher in microbiology.

UNIT-I   (18 Hours)
Introduction - Meaning, types and importance of Research - Research Process-Problem Identification. Research Design – Meaning, types and Purpose. Data Collection-Sources of Data - Methods of Data Collection. Representation of Data - Literature collection - Preparation of Research report -Manuscript/research article.

UNIT-II   (15 Hours)
Microscopy- Fluorescence, Scanning and Transmission Electron Microscopy-Affinity chromatography, HPLC, GC-MS, UV-Visible spectrophotometer, NMR - SDS-PAGE, Agarose gel electrophoresis, 2D-Electrophoresis and Gel Documentation - Autoradiography.

UNIT- III   (12 Hours)

Principles and applications of Southern, Northern and Western blotting techniques, PCR, RT-PCR, and qPCR - DNA finger printing: RFLP, RAPD and AFLP. Automated DNA sequencing.

UNIT-IV (18 Hours)

Measures of Mean, Median and Mode - Standard Deviation and Standard Error - Regression and Correlation coefficient analysis; Student's t-test; Analysis of Variance (ANOVA); Chi-Square test. Statistical packages (SPSS).

UNIT-V (12 Hours)

Concept of biosafety, biosafety levels, biocontainment, good microbiological practices- Intellectual property rights, patents- Trade secrets, Copyrights, Trade mark.

Text Books:

Unit- 1:

1. Kothari, C.R., Research Methodology – Methods and Techniques, New Age International Publishers, New Delhi, 2007.
2. Montgomery, Douglas C. (2007), 5/e, Design and Analysis of Experiments, (Wiley India)

Unit- 2:

1. Jayaraman.J (1981). Laboratory manual in Biochemistry, New Age Int. Publishers, New Delhi.
2. L.L. Merritt Jr. (1986). Instrumental Methods of Analysis. 6th Edition by H.H. Willard, CBS Publishers and Distributors.
3. P.D.Dabre (1998). Introduction to Practical Molecular Biology, John Wiley & Sons Ltd., New York.

Unit-3:

1. Glick, B.R. and J.J. Pasternack, (1998). Molecular Biotechnology (2nd Edition). ASM Press, Washington, DC.

Unit 4:

1. Prem S. Mann, 2004. Introductory Statistics. Fifth Edition. John Wiley sons.
2. Sokal and Rohif, (1973) Introduction to Biostatistics - Toppan Co. Japan.

Unit 5:

1. Attwood T.K. and D.J. Parry-Smith, (2001). Introduction to Bioinformatics Pearson Education, Asia.
2. Recombinant DNA safety guidelines, (January1990), Department of Biotechnology, Ministry of Science & Technology, Government of India, New Delhi.
3. WHO Laboratory manual 3rd edition 2004. Laboratory Biosafety and Biosecurity Guidance

Reference Books:

1. Wardlaw, A.C. (1985). Practical Statistics for Experimental biologist
2. Bailey, N.T. J. (2000). Statistical Methods in Biology, English Univ. Press.
3. Campbell R.C. (1974). Statistics for Biologist by Cambridge University Press, UK.
4. Gel Electrophoresis of Proteins -A Practical Approach by Hanes.
5. James Miller (1988). Chromatography: Concepts and Contrasts. John Wiley and Sons. Inc., New York.
6. Revised guidelines for research in Transgenic plants, (August 1998), Department of Biotechnology, Ministry of Science & Technology, Government of India, New Delhi.
7. Bajpai, S. (Ed.), (2006). Biological instrumentation and methodology. Chand & Company Ltd., New Delhi.

8. Jeffrey A. W. and L. S. Myra, (2002). Statistics for the Life Sciences (3rd Edition). Prentice Hall
9. David W. M., (2001). Bioinformatics. Sequence and Genome Analysis,
10. Methods of Protein and Nucleic acid Research, Osterman Vol
11. Sambrook &David W.Russell, Molecular Cloning – A laboratory Manual –Cold Spring Harbor laboratory Press, Cold Spring Habor, NewYork.

Title of the paper: Food & Dairy Microbiology (Elective-3)
Contact Hours per week: 5   Contact Hours per semester: 75   Credits: 5
Subject Code: P1MBE41

Objectives:
1. To gain knowledge about the extrinsic and intrinsic parameters that affect bacterial growth.
2. To familiarize the primary sources of microorganisms in meat, poultry and vegetable products as well as the establishment's environment.
3. To create awareness about food contamination and food borne illness.

UNIT-I   **(15 Hours)**
Food as a substrate for microorganisms- Role of microbes (mold, yeast, bacteria) in food- General contamination in food: plants, animals, sewage, soil and water- General food spoilage and spoilage of heated canned foods

UNIT-II   **(15 Hours)**
Food preservation: Asepsis, Removal of microorganisms, High temperature, Low temperature, Food additives, Drying and Radiation

UNIT-III   **(15 Hours)**
Contamination, Preservation and Spoilage of Cereals, Vegetables, Meat, Poultry and Fish.

UNIT-IV   **(15 Hours)**
Contamination, Preservation and Spoilage of Milk and Milk products- Quality testing of Milk: Dye reduction test and Phosphatase test - Preparation of fermented food products: Yogurt, Sauerkraut and Vinegar.

UNIT-V   **(15 Hours)**
Food borne diseases: Bacterial food intoxication (*Botulism, Staphylococcus*), Bacterial food infection (*Salmonella, Clostridium, Vibrio*)- Fungal food intoxication (Mycotoxin, Aflatoxin and Patulin)- HACCP

Text Books
From units I -IV
1. Adams MR & Moss MO. Food Microbiology, New age international (P) Ltd publications, London
2. Frazier WC & Westhoff DC, Food Microbiology 5th edition, McGraw Hill publications, New York.

Units V
1. Hobbs BC and Roberts D, Food poisoning and food hygiene, Edwards Arnold, London
2. Frazier WC & Westhoff DC, Food Microbiology 5th edition, McGraw Hill publications, New York.

References

1. Banwart, G.J., (1989). Basic Food Microbiology, 2nd Edition CBS Publishers and Distributors, New Delhi.
2. Robinson R.K (1990) Dairy Microbiology, Elsevier Applied science, London.
3. Hobbs BC Roberts D (1993). Food Poisoning and Food Hygiene Edward Arnold, London.

PROJECT WORK   **SEMESTER-IV**
Credit-12   **Sub code-PIMB4PV**
Hours/week-20
Objectives:

The aim of project work (lab work) is to inculcate students to learn adequate knowledge on research methodology in the subject and prepare them for pursuing research in experimental or computational areas of the subject. Students allotment by lot system. The project work Study is to be undertaken under the guidance of a Teacher of the Department. The guiding teacher will make continuous internal assessment of the Project Work. No teacher shall be permitted to guide more than *three* students in a semester for Project Work under his/her supervision. The project work will be evaluated by the external examiner.

- Project will be done by the final year students in the fourth semester under the guidance of respective guides.
- For projects internal marks (max 40) will be awarded by the respective guide and external marks (max 60) will be awarded in the external examinations.
- Minimum number of Pages for M.Sc. Project thesis should be 50