VIRUDHUNAGAR HINDU NADARS' SENTHIKUMARA NADAR COLLEGE
(An Autonomous Institution Affiliated to Madurai Kamaraj University)
[Re-accredited with 'A' Grade by NAAC]
Virudhunagar – 626 001.

11.10.2021

MINUTES OF THE THIRTEENTH ACADEMIC COUNCIL MEETING

The Thirteenth Academic Council Meeting of Virudhunagar Hindu Nadars' Senthikumara Nadar College (Autonomous), Virudhunagar was held on 11.10.2021 (Monday) at 3.00 pm. in K. C. S. Rathinasamy Nadar - R. Mariammal Memorial Building.

The Chairperson and Principal welcomed the gathering.

The Chairperson introduced the newly nominated University Nominees Dr. M. Thangaraj, Professor & Head, Department of Computer Science, School of Information Technology, Madurai Kamaraj university, Dr. G. Kumaresan, Professor & Head, Department of Genetics, School of Biological Sciences, Madurai Kamaraj university, Dr. N. Sankar, Professor, Department of Genetic Engineering, School of Biotechnology, Madurai Kamaraj university, to the Academic Council forum. The Chairperson also introduced the newly nominated members Dr. J. Vimal Priyan, Head, Department of Commerce CA (SF), Dr. M. Balaji, Head, Department of Management Studies, and Dr. S. Jeyakumar, Coordinator, Department of Environmental Science, to the Academic Council forum.

The Principal presented before the Council a brief progress report on Autonomy.

Nine subjects were presented for resolution:

Subject 1:

Approval for the new syllabus for the first & second year M.Com CA passed in the Board of Studies Meeting.

The Principal invited the Chairperson of the Board of Studies to move the subject for the approval of the Academic Council.

Dr. J. Vimal Priyan, Chairperson, Board of Studies of M.Com CA, moved the subject for the approval by the Academic Council for the new syllabus for the first & second year M.Com CA passed in the Board of Studies Meeting held on 14.07.2021 and the subject codes allotted to them are given in **Annexure-I**.

Resolution

The subject was considered and resolved to approve the new syllabus for the first & second year M.Com CA passed in the Board of Studies Meetings held on 14.07.2021 and also the new subject code allotted to each subject.

Subject 2:

Approval for the revised syllabus for the first & third year UG programmes passed in the Board of Studies Meeting.

The Principal invited the Chairpersons of the Board of Studies to move the subject for the approval of the Academic Council.

Dr. N. Prithivikumaran, Chairperson, Board of Studies of B.Sc. Physics, moved the subject for the approval by the Academic Council for the revisions in the syllabus of the first & third year B.Sc. Physics passed in the Board of Studies meeting held on 28.04.2021 and also for the new subject code allotted to each subject as given in **Annexure-I**.

Mrs. B. Salocia Fernando, Chairperson, Board of Studies of B.Sc. Botany, moved the subject for the approval by the Academic Council for the revisions in the syllabus of the first year B.Sc. Botany passed in the Board of Studies meeting held on 28.04.2021 and the subject code allotted to each subject as given in **Annexure-I**.

Dr. K. Nagarajan, Chairperson, Board of Studies of B.Sc. Zoology, moved the subject for the approval by the Academic Council for the revisions in the syllabus of the first year B.Sc. Zoology passed in the Board of Studies meeting held on 28.04.2021 and the subject code allotted to each subject as given in **Annexure-I**.

Resolution

The subjects were considered and resolved to approve the revisions made in the syllabus for the first & third year UG programmes passed in the Board of Studies Meetings held on 28.04.2021 and also the new subject code allotted to each subject.

Subject 3:

Approval for the revised syllabus for the first year PG programmes passed in the Board of Studies Meeting.

The Principal invited the Chairperson of the Board of Studies to move the subject for the approval of the Academic Council.

Dr. K. Nagarajan, Chairperson, Board of Studies of M.Sc. Zoology, moved the subject for the approval by the Academic Council for the revised syllabus for the first year M.Sc. Zoology passed in the Board of Studies meeting held on 28.04.2021 and the subject code allotted to each subject as given in **Annexure-I.**

Resolution

The subject was considered and resolved to approve the revisions made in the syllabus for the first year M.Sc. Zoology passed in the Board of Studies Meetings held on 28.04.2021 and also the new subject code allotted to each subject.

Subject 4:

Approval for the new syllabus for the second year M.C.A & PGDCA passed in the Board of Studies Meeting.

The Principal invited the Chairperson of the Board of Studies to move the subject for the approval of the Academic Council.

Mr. D. Rajkumar, Chairperson, Board of Studies of M.C.A & PGDCA moved the subjects for the approval by the Academic Council for the new syllabus for the second year M.C.A & PGDCA passed in the Board of Studies Meeting held on 28.04.2021 and the subject codes allotted to them are given in **Annexure-I**.

Resolution

The subject was considered and resolved to approve the new syllabus for the second year M.C.A & PGDCA passed in the Board of Studies Meetings held on 28.04.2021 and also the new subject code allotted to each subject.

Subject 5:

Approval for the new syllabus for the third year B.Voc. Programme on Food Safety and Quality Management and B.Sc. Physical Education passed in the Board of Studies Meeting.

The Principal invited the Chairpersons of the Board of Studies to move the subject for the approval of the Academic Council.

Dr. S. Jeyakumar, Chairperson, Board of Studies of B.Voc. Programme on Food Safety and Quality Management moved the subject for the approval by the Academic Council for the new syllabus of the third year B.Voc. Programme on Food Safety and Quality Management passed in the Board of Studies meeting held on 28.04.2021 and the subject code allotted to each subject as given in **Annexure-I**.

Dr. T. Murugesan, Chairperson, Board of Studies of B.Sc. Physical Education moved the subject for the approval by the Academic Council for the new syllabus of the third year B.Sc. Physical Education passed in the Board of Studies meeting held on 28.04.2021 and the subject code allotted to each subject as given in **Annexure-I**

Resolution

The subjects were considered and resolved to approve the syllabus framed for the third year B.Voc. Programme on Food Safety and Quality Management & B.Sc. Physical Education passed in the Board of Studies meeting held on 28.04.2021 and also the new subject code allotted to each subject.

Subject 6:

Approval for changes in the Internal Evaluation Pattern (UG & PG)

Dr. A. Sarathi, Dean - Internal Exams, moved the subject for the approval by the Academic Council for the changes in the Internal Evaluation Pattern for UG & PG programmes from the academic year 2021-2022. The changes in Internal Evaluation pattern, including ERL (E-Resource Learning) for Part I, II & III courses for UG programmes and for all courses for PG programmes are given in **Annexure – II.**

Resolution

The subject was considered and resolved to approve the changes in the Internal Evaluation Pattern, including ERL (E-Resource Learning) and subsequent changes in the internal evaluation pattern for Part I, II & III courses for UG programmes and for all courses for PG programmes from the academic year 2021-2022.

Subject 7:

Approval for the changes in Question Pattern of PART-I, II & III courses for UG Programmes in Summative Examinations from November-2021.

Dr. R. Palaniappan, Controller of Examinations & SF Coordinator, moved the subject for the approval by the Academic Council for the changes in Question Pattern of PART-I, II & III courses for UG Programmes in Summative Examinations from November-2021 which is given in **Annexure – III**.

Resolution

The subject was considered and resolved to approve the the changes in Question Pattern of PART-I, II & III courses for UG Programmes in Summative Examinations from November-2021.

Subject 8:

Approval for equivalent courses for private students (2012 - 2015 batches)

Dr. R. Palaniappan, Controller of Examinations & SF Coordinator, moved the subject for the approval by the Academic Council for conducting equivalent courses for private students (2012 - 2015 batches) for both UG & PG programmes, as per UGC Guidelines, with effect from the November 2021 Summative Examinations, which is given in **Annexure – IV.**

Resolution

The subject was considered and resolved to assign current equivalent courses for the private students (2012-2015 batches) for both UG & PG programmes with effect from the

November 2021 Summative Examinations. It was also resolved to retain the previous internal score for the respective equivalent courses.

Subject 9:

Approval for changing the courses Value Education and Environmental Studies as mandatory self learning courses from 2022-2023.

Dr. K. Nagarajan, Dean Curriculum (Science), moved the subject for the approval by the Academic Council for changing the courses Value Education and Environmental Studies as mandatory self learning courses from 2022-2023.

Resolution

The subject was considered and resolved to change the courses Value Education and Environmental Studies as mandatory self learning courses from 2022-2023.

All the Nine resolutions were unanimously passed.

Out of 38 members, 33 turned out for the meeting and 5 members got permission to be absent.

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

Members Present:

S.No.	Name and Designation	Signature
1.	Dr. P. Sundara Pandian	
2.	Mr. P. K. Arunachalam	
3.	Dr. K. Sridhar	
4.	Dr. J. Samuel Kirubahar	
5.	Dr. M. Mariappan	13/10/2021
6.	Dr. G. Ravi	

7.	Mr. R. Mohan	
8.	Dr. N. Prithivikumaran	
9.	Dr. C. Karunakaran	11/10/2021
10.	Ms. B. Salocia Fernando Additional Dean Curriculum (Science)	
11.	Dr. K. Nagarajan Dean Curriculum (Science)	
12.	Dr. T. Kathirvalavakumar	11/10/21
13.	Dr. B. Ravichandran	11.10.21
14.	Dr. J. Vimal Priyan	
15.	Dr. G. Murugesan	11/10/2021
16.	Dr. M. Balaji	
17.	Mr. Z. Ramya Sushil	
18.	Dr. A. Balasubramanian	
19.	Mr. D. Rajkumar	11/10/2021
20.	Dr. T. Murugesan	11/10/2021
21.	Dr. S. Jeyakumar	
22.	Lt. Dr. N. Alagumanikumaran	
23.	Dr. M. Meena Devi Dean Curriculum (Arts)	

24.	Dr. N. Raman	
25.	Dr. A. Mohini	11/10/21
26.	Dr. R. Palaniappan Controller of Examinations & SF Coordinator	
27.	Mr. R. Rajesh, B.E. M.B.A.	
28.	Mr. K.C. Gurusamy, B.Sc.	
29.	Dr. M. Thangaraj Professor and Head, Department of Computer Science, School of Information Technology, Madurai Kamaraj University Madurai – 625 021.	11/10/21
30.	Dr. A. Sarathi Dean - Internal Exams	11/10/2021
31.	Dr. P. Sami Dean - Student Services	
32.	Dr. N. Jeyakumaran Dean - Research	
33.	Dr. S. Muthulakshmi Additional Dean Curriculum (Arts)	Muthulakshmi S 13/10/2021

ANNEXURE - I

Course Name: **M.Com (Computer Applications)**
Discipline: **Commerce with Computer Applications (SF)**
(For those who joined in June 2021 and after)

M.Com (Computer Applications)

Course Objectives

1. To impart knowledge in advanced concepts and applications in various fields of Commerce.
2. To teach the recent developments in the various areas of Commerce.
3. To orient the students in the applied aspects of different advanced business practices.
4. To provide the students the avenues of studies in parallel professional Courses.
5. To equip the students to occupy the important positions in business, industries an related organizations.
6. To inspire the students to apply the knowledge gained for the development of society in general.

Eligibility for Admission

Candidates seeking admission to the first year of the Master of Commerce degree course shall possess

(a) B. Com / B. Com (CA) or
(b) Any other degree with at least one paper in Accountancy.

Duration of the Course

The course shall extend over a period of two academic years consisting of four semesters. Each academic year will be divided into two semesters.

Semester		Name of the Subject	Hrs.	Credits	Int. + Ext =Total	Subject Code	Revised / New / No Change / Interchanged & Percentage of revision	Courses having focus on employability/ entrepreneurship/ Skill development
I	Core	Business Statistics	6	5	40+60=100	P21CCC11	Employability	Name Changed and Revised - 45%
	Elective	Banking Technology	6	4	40+60=100	P21CCE11	Employability	Name Changed and Revised - 35%
	Core	Advanced Cost Accounting	6	5	40+60=100	P21CCC12	Entrepreneurship	No Change
	Core	E-Commerce	6	4	40+60=100	P21CCC13	Skill development	No Change
	Core	Lab: Multimedia Lab	6	3	40+60=100	P21CCP11	Skill development	No Change
II	Core	Operations Research	6	5	40+60=100	P21CCC21	Employability	Revised - 30%
	Core	Advanced Financial Accounting	6	5	40+60=100	P21CCC22	Employability	Revised - 45%
	Elective	Investment Management	5	5	40+60=100	P21CCE21	Employability	Name Changed and Revised - 70%
	Core	Computerized Accounting	5	4	40+60=100	P21CCC23	Employability / Skill development	No Change
	Core	LAB: Computerized Accounting	5	3	40+60=100	P21CCP21	Skill development	No Change
	NME	Marketing Management	4	4	40+60=100	P21CCN21	Skill development	New – 100%

Semester – I

BUSINESS STATISTICS

Hours: 6 hrs/ week 90 Hrs **Subject code:** P21CCC11 **Credits: 5**

Objectives

To provide working knowledge on statistical methods to develop skills in using quantitative tools to solve the business problems.

Unit I **18 Hours**

Correlation Analysis: Significance – Correlation Vs Causation – Types of Correlation – Karl Pearson's coefficient – Interpreting coefficient of Correlation – Probable Error of coefficient of Correlation – Coefficient of Determination – Properties of the coefficient of Correlation – Rank Correlation Coefficient

Unit II **18 Hours**

Regression Analysis: Meaning and uses – Correlation Vs Regression – regression equations – Properties of Regression Coefficient – Standard Error of Estimate

UNIT III **18 Hours**

Testing of Hypothesis: Meaning, Procedures – Type I Error and Type II Error – Two tailed and one tailed tests – Z Test – t-Test.

Unit IV **18 Hours**

Chi Square Test: Properties, Uses, Conditions for applying Chi Square Test – Goodness of Fit Test ,Test of Independence

Unit V **18 Hours**

F Test – Analysis of Variance: Assumptions, Uses, One way classification, and Two way classification – Mann Whitenay U test

BOOK RECOMMENDED

1. Sanchetti and Kapoor – Advanced statisitical methods, 2014, Sultan Chand.
2. Gupta S.P. – Statistical methods, 2014, Sultan Chand Publishers.
3. Statistics - S.C Gupta

Note: 20% Theory & 80% Problems

BANKING TECHNOLOGY

Hours: 6 hrs/ week 90 Hrs **Subject code:** P21CCE11 **Credits: 4**

Objectives:

To enhance the students' knowledge on technology in banking like core banking, internet banking, electronic fund transfer methods, etc.

Unit – I **(18 Hours)**

Concepts of Banking Technology – Introduction – Banking Technology – Evolution – concepts – Electronic Banking – Traditional banking Vs E-banking

Unit – II **(18 Hours)**

Existing Technology frame work – Computerized banking – Core banking – Online Banking – Mobile Banking – Advantages – Issues .

Unit – III **(18 Hours)**

Internet Banking – Online enquiry and update facilities – ATM and Debit card – Smart card – Credit card.

Unit – IV **(18 Hours)**

Electronic Fund Transfer – Electronic Payment System – Electronic Clearing System – Debit and Credit clearing – E-cash: SWIFT – IMPS – RTGS – NEFT –AEPS – RBI-Net data.

Unit – V **(18 Hours)**

Privacy and Security - Data Management and Privacy – Protecting confidentiality and Secrecy of data – encryption – Cyber Laws and its implementation – Cyber issues in Online Transactions.

TEXT BOOKS:

1. Banking Technology – Dr.A.Rama

REFERENCE BOOKS:

1. Naidu. C.A.S – Information technology in Indian commercial banks, NIBM Pune.
2. Electronic banking and information technology – IIB

ADVANCED COST ACCOUNTING

Hours: 6 hrs/ week 90 Hrs **Subject Code: P21CCC12** **Credits: 5**

Objective:

To improve the knowledge of students on Process Costing, Standard Costing, Contract Costing, Marginal Costing and Budgetary Control.

Unit I **18 Hours**

Process Costing – Normal Loss - Abnormal Loss – Joint product - By-product – Equivalent Production – Inter Process Profit.

Unit II **18 Hours**

Contract Costing – Contract account for more than one year – Profit from incomplete Contracts – Operating Costing.

Unit III **18 Hours**

Marginal Costing –Difference between marginal costing and traditional costing – Marginal Cost statement – Contribution – Profit-volume Ratio – Break-Even Point - Margin of Safety – Angle of Incidence – Managerial Decisions: Make or Buy – Product Mix – Key factor – Shut or Run – Price quotations – Analysis of Changes in Profit.

Unit IV **18 Hours**

Budget - Budgetary Control System - Features – Elements - Types of Budget – Functional Budgets: Sales Budget, Material Purchase Budget, Cash Budget – Flexible Budget – Activity Ratios.

Unit V **18 Hours**

Standard Costing – Setting Standards – Variance Analysis – Material Variance – Labour Variance – Overhead Variance – Sales Variance – Responsibility Accounting.

BOOKS RECOMMENDED

1. Advanced cost accounting – Jain and Narang
2. Cost accounting – B.K.Bhar
3. Principles and practice of cost accounting – N.K.Prasad
4. Cost accounting – S.P.Iyengar.
5. Cost accounting – Jawaharlal
6. Cost accounting – Charles T.Horngren

Note: 20% Theory & 80% Problems

E-COMMERCE

Hours: 6 hrs/ week 90 Hrs **Subject Code: P21CCC13** **Credits: 4**

Objective:

To enable the students to acquire Knowledge on Electronic Commerce.

Unit I **18 Hours**

E-Commerce Framework – Electronic Commerce and Media Convergence – The Anatomy of E-Commerce Applications – Electronic Commerce Consumer Applications – Electronic Commerce Organization Applications – The Internet Terminology - Internet Governance: The Internet Society - An overview of Internet Applications.

Unit II **18 Hours**

Architectural Framework for Electronic Commerce – World Wide Web (WWW) as the Architecture – Security and the Web – Types of Electronic Payment Systems – Digital Token-based Electronic Payment Systems – Smart Cards and Electronic Payment Systems – Credit Card-Based Electronic Payment Systems – Risk and Electronic Payment Systems.

Unit III **18 Hours**

Electronic Data Interchange – EDI Applications in Business – EDI: Legal, Security and Privacy Issues – EDI and Electronic Commerce – EDI Software Implementation – Value-Added Networks (VANs) – Internet-Based EDI.

Unit IV **18 Hours**

The New Age of Information-Based Marketing – Advertising on the Internet – Charting the On-Line Marketing Process – Market Research – Electronic Commerce Catalogs or Directories – Information Filtering.

Unit V **18 Hours**

Computer Based Education and Training – Technological Components of Education On-Demand – Digital Copyrights and Electronic Commerce – Layers and Networking – Internet Protocol Suite – Mobile TCP/IP based Networking.

Text Book:

1. Frontiers of Electronic Commerce – Ravi Kalakota, Andrew B. Whinston PEARSON Education

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LAB: Multimedia Lab

Hours: 6 hrs/ week 90 Hrs **Subject Code: P21CCP11** **Credits: 3**

Objective:

To enable the students to acquire Knowledge on Multimedia Technology.

List of Programs

Flash

1. Flash movie for motion along a path using object
2. Flash movie for masking the image
3. Flash movie for deer running animation using movie clip.
4. Flash movie for transforming shapes
5. Flash movie for text morphing
6. Flash move for marquee the text
7. Flash movie for ball animation using script
8. Flash movie for arithmetic calculator using script
9. Flash movie for applying various text effects.
10. Flash movie for number counting animation.

Photoshop

1. Design a colorful visiting card
2. Design your own product wrappers
3. Convert b/w image into color image
4. Design a monthly calendar
5. Create a departmental event brochure
6. Apply different filters to images
7. Design a flex banner of your college function

Corel Draw

1. How to insert a picture in the existing image background?
2. Create a 3D text in Corel Draw.
3. Create an advertisement for a textile company in Corel.
4. Design a business card for a company embed photo in it.
5. Design a banner for a marriage function.

SEMESTER – II

OPERATIONS RESEARCH

Hours: 6 hrs/ week 90 Hrs **Subject Code: P21CCC21** **Credits: 5**

Objectives

To provide computation skills to the students to take managerial decisions with the help of Linear Programming, Transportation Model and Game Theories.

Unit I **18 Hours**

Linear Programming: Definition and Applications of LP – Formulation of LPP- Simplex method: Maximization problem, Minimization problem (using Big-M method), Simplex problems with mixed constraints – Two Phase Simplex method: Maximization case with mixed constraints, Minimization case with mixed constraints – Primal and Dual relationship: Constructing the Dual problem.

Unit II **18 Hours**

Transportation problem – Initial Basic Feasible Solution: North-west Corner Rule and Vogel's approximation method –Modified Distribution method – Unbalanced Transportation problem – Degeneracy: Meaning, Degeneracy an initial solution, Degeneracy during the test of optimality – Profit maximization in Transportation problem.

UNIT III **18 Hours**

Assignment problems: Principles – Applications – Assignment Problem Vs Transportation Problems, unbalanced minimization problem, maximization case in assignment problem, traveling salesman problem, prohibited route assignment problem, air crew assignment problem.

Unit IV **18 Hours**

Game Theory: Meaning, Features – Uses – Limitations – Strategy: Pure strategy and mixed strategy – Saddle point and value of the game – Game with Mixed strategies: Solution of 2 x 2 matrix without saddle point using probability method, Dominance Method and Sub-games method.

Unit V **18 Hours**

Net work Analysis: Meaning, and Applications –Rules to frame a network – Critical Path: – PERT: PERT Vs CPM, Steps involved in PERT calculations, Probability of project completion by a Target Date – Merits and Demerits of PERT.

RECOMMENDED BOOKS

1. Operation research - Prem kumar Gupta D.S.hira
2. Operation research theory & application - J.K.Sharma
3. Problems & solution in operation research - V.K.Kapoor

Note: 20% Theory & 80 % Problems

ADVANCED FINANCIAL ACCOUNTING

Hours: 6 hrs/ week 75 Hrs Subject Code: P21CCC22 Credit: 5

Objective:

To provide advanced knowledge in partnership accounting

Unit – I **(15 Hours)**

Preparation of Final Accounts of Sole Proprietor – Advanced Adjustments (Loss of Stock, Managers Commission, Free Samples, Goods sent on Sale or Return basis).

Unit – II **(15 Hours)**

Hire purchase accounting – calculation of interest – cash price – accounting treatment in the books of hire purchaser and hire vendor – Default and repossession – Stock and Debtors system.

Unit – III **(15 Hours)**

Admission of a partner - effect of admission of a partner on change in the profit sharing ratio, treatment of goodwill (as per AS 10), treatment for revaluation of assets and reassessment of liabilities, treatment of reserves and accumulated profits, adjustment of capital accounts and preparation of balance sheet.

Unit – IV **(15 Hours)**

Effect of retirement / death of a partner on change in profit sharing ratio - treatment of goodwill (as per AS 10) - treatment for revaluation of assets and re-assessment of liabilities - adjustment of accumulated profits and reserves - Calculation of deceased partner's share of profit

till the date of death - Preparation of deceased partner's capital account and executor's account - Preparation of balance sheet.

Unit – V **(15 Hours)**

Dissolution of partnership firms: types of dissolution of firm - Settlement of accounts – Accounting entries for dissolution – Settlement of the accounts of the partners: Case I when all the partners are solvent - Case II when some of the partners are solvent and others are insolvent, Decision in Garner Vs Murray - Case III when all the partners are insolvent - Piece-meal distribution : Priority of distribution – Surplus capital method – Maximum loss method – Application of Garner Vs Murray rule in piece-meal distribution.

TEXT BOOK:

1. Advanced Accountancy – T.S.Reddy & A.Murthy – Margham Publications, Chennai 2014

REFERENCE BOOKS:

1. Advanced Accountancy – P.C.Tulsian – Dorling Kindersley India Pvt Ltd 2012
2. Jain & Narang – Advanced accounting, 2007, Kalyan Publishers
3. Advanced Accountancy – S.N.Maheswari & S.K.Maheswari – Vikas Publishing House pvt Ltd – Noida 2011
4. Shukla & Grewal – Advanced accounts, 2008 S.Chand publication , Delhi.
5. R.L.Gupta – Advanced accounting, 2007 Sultan Chand , Delhi.
6. Arulanandam & Raman – advanced accounting, 2007, Himalaya publishing.

Note: The questions will be asked in the ratio of 80% for problems and 20% for theory.

INVESTMENT MANAGEMENT

Hours: 5 hrs/ week 75 Hrs **Subject code:** P21CCE21 **Credits: 5**

Objectives

To develop competency to the student on various concept of investment management using security analysis and evaluation methods.

UNIT I **15 Hours**

Nature and Scope of Investment Management – Securities Market in India – Organisation and Structure – Primary Market – Secondary Market – Derivatives Market – Role of SEBI – Investors Protection in Primary and Secondary markets.

UNIT II **15 Hours**

Security Analysis – Fundamental Analysis –Economic Indicators– Industrial Factors – Company Analysis – Technical Analysis – Indicators, Theories, Charts and Patterns – Efficient Market Hypothesis - Random Walk Theory.

UNIT III **15 Hours**

Return and Risk Analysis – Valuation Models – Bonds – Preference Securities – Equity Shares.

UNIT IV **15 Hours**

Concept of Portfolio risk and return – Portfolio Construction Models – Markowitz Model – Sharpe Index Model – CAPM Theory – Arbitrage Pricing theory.

UNIT V **15 Hours**

Portfolio Evaluation – Need and the process of Evaluation – Portfolio revision – the Formula Plans – Rupee Cost Averaging – Constant Rupee Value – Constant Ratio – Variable Ration Plans.

BOOKS RECOMMENDED

1. Fischer and Jordon – security analysis and portfolio management, 2008, Prentice hall.
2. William, F.Sharpe – investment, 2005, prentice hall.
3. Jack clark francis – Management of investment, Mc Graw Hill.
4. Russell J. Fuller – Modern Investment and security analysis, 2007, Vikas publishers
5. Punithavathy pandian – Security analysis and portfolio management, Vikas publishers
6. Bhalla V.K. – Investment management, S.Chand
7. Avadhani V.A. – Investment and security markets in India, 2006 – Himalaya.

Note: 60% Theory & 40 % Problems

COMPUTERIZED ACCOUNTING

Hours: 5 hrs/ week 75 Hrs Subject Code: **P21CCC23** **Credits: 4**

Learning Objectives: To enhance the knowledge of the students regarding accounting software usage in accounting.

Unit I **15 Hours**

Accounting on Computers: Introduction – Accounting system – Benefits of accounting on computers –Tally fundamentals – Key components of Tally – Creation of companies – Alter companies – Deletion of Companies – Tally Screen – Backup and Restore F11: Features – F12:Configuration.

Unit II **15 Hours**

Groups – Single Groups – Multiple Groups - Ledger Creation – Single Ledger – Multiple Ledger – Display of Ledger - Alteration of Ledger – Deletion of Ledger – Voucher type Creation - Voucher entry like Contra, Payment, Receipt, Journal, Sales, and Purchase – Cost centre – Cost Category

Unit III **15 Hours**

Inventory – Stock Group - Stock Item – HSN Code – Units of Measure – Simple Unit – Compound Unit - Bill wise Details: New Ref. – Agst Ref. – On Account – Advance – Godown Creation – Single Godown – Multiple Godown - Manufacturing voucher – Debit Note Voucher – Credit Note Voucher – New Voucher Creation

Unit IV **15Hours**

GST – Meaning – Advantages and Disadvantages of GST in Business – GST Creation in Tally – CGST – SGST – IGST - GST Number – GST Forms - ITC – Offset Liability in GST – Regular Dealer – Composition Dealer

Unit V **15 Hours**

Reports printing –Configuring Trail Balance - Configuring Profit & Loss Account – Configuring Balance Sheet – Stock Summary Report- Day Book – Account Books – Statement of Accounts – Inventory Books – Statements of Inventory – List of Accounts

Text Book:

1. ComdexTally 9, Dr. Namrata Agrawal, *Dream Tech Press*,2007.

Reference Book:
1. Tally (Ver. 9),C. Nellai Kannan, *Nels Publications,* 2004.

LAB: COMPUTERIZED ACCOUNTING

Hours: 5 hrs/ week 90 Hrs Subject Code: **P21CCP21** **Credits: 3**

Objective:

To enhance the knowledge of the students regarding Tally usage in accounting.

List of Programs

1. Create a new company with ledger creation including opening balance.
2. Prepare final accounts with adjustments (Outstanding expenses, Prepaid expenses, Depreciation, Income received in advance, Interest on Capital, Interest on Drawings and Closing stock.
3. Prepare Journal entries and display the accounting reports – Trail balance, Day book
4. Prepare subsidiary books.
5. Prepare a voucher in Actual & Billed Quantity.
6. Create a Cost centre and Cost Category.
7. Create Multi Currency.
8. Creation of stock group, stock item, and Multi Godown with Inventory accounting.
9. Prepare manufacturing journal.
10. Make purchase and sales invoice with GST calculation.

MARKETING MANAGEMENT

Hours: 4 hrs/ week 60 Hrs **Subject code:** P21CCN21 **Credits: 4**

Objectives

To create awareness on marketing concepts, marketing management and the opportunities and challenges of marketing to the students belonging to other faculties.

UNIT I **12 Hours**

Market, Marketing, Modern Marketing Concept – Marketing functions – Various approaches to the study of marketing – Marketing Vs Selling – Concept of Social Welfare – Objectives of Marketing Management – Marketing Mix.

UNIT-II **12 Hours**

Concept of Product – Classification of products- Product Mix- Product Mix Decisions – New Product – New Product Development Stages – Product Life Cycle Stages and Implications – Branding – Packaging & Labelling.

UNIT – III **12 Hours**

Pricing – Objectives of Pricing – Role of Price in Marketing Mix – Factors influencing Price Determination –New Product Pricing Skimming and Penetration Pricing – Pricing Approaches – Cost based – Value Based – Competition – Pricing Methods.

UNIT – IV **12 Hours**

Promotion – Significance – Promotion Mix – Advertising– Types of Advertising – Media - Advertising Effectiveness – Objections - Publicity - Personal selling - Sales Promotion measures.

UNIT - V **12 Hours**

Marketing Channels – Selection of Channel – Wholesalers – Retailers – Agents – Online Marketing Channels - Merits and limitations.

RECOMMENDED BOOKS

1. Czinkota: Marketing Management,
2. Philip Kotler: Principles of Marketing, Pearson/PHI 2007
3. Ramasamy & Namakumari: Marketing Management
4. Jain: Marketing Planning & Strategy
5. Gandhi IC: Marketing Management
6. Me Carthy EJ & OthelS: Basic Marketing
7. Rosenbloom: Marketing Channels
8. Majare: The Essence of Marketing
9. Ian Chasten: New Marketing Strategies
10. Rajan Saxena: Marketing Management

Course Name: **M.Com. (Computer Applications)**
Discipline: **Commerce with Computer Applications (SF)**
CHOICE BASED CREDIT SYSTEM
(For those who joined in June 2021 and after)
COURSE SCHEME:

Semester		Subject	Hours	Credit	Int + Ext =Total	Subject Code	Revised / New / No Change / Interchanged & Percentage of revision	Courses having focus on employability/ entrepreneurship/ Skill development
III	Core	Direct Taxes	6	5	40+60=100	P21CCC31	Revised - 35%	Skill Development
	Elective	Research Methodology	6	5	40+60=100	P21CCE31	No Change	Skill Development
	Core	Corporate Accounting	6	5	40+60=100	P21CCC32	Name Changed and Revised – 75%	Employability
	Core	VB with Oracle	6	4	40+60=100	P21CCC33	No Change	Employability
	Core	LAB: Client Server	6	3	40+60=100	P21CCP31	No Change	Skill Development
IV	Core	Core:Financial Management	6	5	40+60=100	P21CCC41	Revised - 15%	Employability
	Elective	Goods and Services Tax and Customs Duty	6	5	40+60=100	P21CCE41	No Change	Employability
	Core	Core:Financial Derivatives	6	4	40+60=100	P21CCC42	No Change	Employability
	Core	Core:Web Design	6	4	40+60=100	P21CCC43	No Change	Skill Development
	Core	Core:Project work & viva-voce	6	3	50+50=100	P21CC4PV	No Change	Skill Development

III SEMESTER

DIRECT TAXES

Hours: 6hrs/week 90 Hrs **Sub.Code: P21CCC31** **Credits: 5**

OBJECTIVE:

To provide knowledge on the provisions of Income tax law and to provide skills on the computation of the taxable income.

Unit – 1 **(18-Hours)**

Income Tax Act 1961 – Definition - 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 – Perquisites - Exempted Perquisites, Valuation of Car, Accommodation, Medical Facility, Leave Travel Concession, Transfer of Moveable Assets Computation of Income from House Property – Gross Annual Value, Net Annual Value – Deduction in Net Annual Value.

Unit – 3 **(18-Hours)**

Computation of Income from 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.

Note: Question paper should provide 60% credit to problems and 40% credit to theory.

TEXT BOOKS

1. T.S.Reddy and Y.Hari Prasad Reddy – Income Tax Theory, Law & Practice, Margham Publications.
2. Vinod K.Singhania - Direct taxes law and practice, Taxmann's Publication.
3. Mehrotra and Goyal - Income tax law and practice, Sahitya Bhawan Publications.

REFERENCE BOOKS

1. B.B.Lal - Direct taxes practice and planning, International Publishing House Pvt. Ltd.
2. G.Sekar - Handbook on Direct Taxes, Wolters Kluwer India Pvt. Ltd.

RESEARCH METHODOLOGY

Hours: 6hrs/week 90 Hrs **Subject Code: P21CCE31** **Credit: 5**

Objective: To enable the students to acquire knowledge on Research Methodology

Unit – I **(18 hours)**

Business Research – Meaning - Types of Research: Descriptive, Exploratory, Experimental, Historic, Pure and Applied – Research Problem – Research Design – Components of Research Design.

Unit – II **(18 hours)**

Sampling – Census – Universe / Population – Sample – Sampling Techniques- Random and Non Random Sampling – Sampling Frame – Size of the Sample – Sampling and Non Sampling Errors.

Unit – III **(18 hours)**

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.

Unit – IV **(18 hours)**

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.

Unit – V **(18 hours)**

Research Report – Meaning – 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.

Note: 100% Theory.

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.

CORPORATE ACCOUNTING

Hours: 6hrs/week 90 Hrs **Sub. Code:** P21CCC32 **Credits: 5**

OBJECTIVE:

To provide practical knowledge on the financial accounting for corporates including Banking and Insurance companies.

Unit – 1 **(18-Hours)**

Preparation of Final Accounts of Companies – Valuation of Goodwill and Shares.

Unit – 2 **(18-Hours)**

Accounting for Amalgamation, Absorption, Reconstruction of Companies, Alteration of Capital.

Unit – 3 **(18-Hours)**

Accounting for Banking and Insurance Companies – Final Accounts and Schedules.

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.

Note: Question paper should provide 80% credit to problems and 20% credit to theory.

TEXT BOOKS

1. T.S.Reddy and A.Murthy - Advanced Accountancy, Margham Publications. (2015).
2. S.P.Jain & K.L.Narang - Advanced Accountancy – Corporate Accounting (Vol – II), Kalyani Publishers (2017).
3. S.N.Maheswari & S.K.Maheswari - Advanced Accountancy, Vikas Publication House Pvt Ltd.

REFERENCE BOOKS

1. R.L.Gupta & Radhaswamy - Advanced accountancy, Sultan Chand & Sons (2014).
M.C.Shukla and T.S.Grewal - Advanced accounts, S Chand Publishing (2016).

VB with ORACLE

Hours: 6hrs/week 90 Hrs **Sub. Code: P21CCC33** **Credits: 4**

Objectives

- To provide theoretical and programming knowledge in visual basic languages
- To enable the students to acquire knowledge on database systems

Unit – I **(18-hours)**

Introduction – Starting & Exiting Visual Basic – Using Project Explorer – Working with Forms – Using the Properties Window – Using Toolbox – Working with Projects – Printing Projects –Adding Code & Using Events : Using Code Window – Using Naming Conventions – Using Variables –Using Intrinsic Visual Basic Controls – Label & Textbox Controls – Using Command Button Control – Using Frame, Checkbox & Option Button Controls – List Box and Combo Box Controls – Formatting Controls.

Unit – II **(18-hours)**

Working with strings – Using Strings, Converting Strings, Concatenating Strings, Formatting Strings, Manipulating Strings, Comparing Strings. Working with Numbers – Using Numeric Values – Using Numeric Operators – Math Functions –Using Control Statements – If – Select Case – Do – For – For each - Exit Statements.

Unit – III **(18-hours)**

Introduction to DAO: Definition - Setting Properties for DAO objects - Accessing database using DAO - ADO: Definition-Steps to add an ADO control to the Tool box - Setting properties for ADO object for a simple database connection - Difference between DAO and ADO-Data Grid Control.

Unit – IV **(18-hours)**

Introduction to Structured Query Language (SQL): Introduction - Characteristics of SQL-Advantages of SQL- SQL Data Types and Literals - Types of SQL commands - DDL-DML-DQL-DCL-DAS-TCS - SQL Operators - Arithmetic Operators - Comparison Operators – Relational Operators - Row Comparison - Logical Operators - Set Operators - Operator Precedence. Tables: Creating a Table - Modifying a Table - Deleting a Table - Joins and Unions.

Unit – V **(18-hours)**

Queries and Subqueries : Selecting All Columns (SELECT *) - Qualified Retrieval - Eliminating Duplicates – Select using IN – Select using BETWEEN - Select using LIKE - AND,OR and NOT – Subqueries - What is a subquery? - Execution of a Subquery - Nested Subqueries - Parallel Subqueries - Correlated Subquery. Aggregate Functions - SQL Operations: Insert, Update and Delete Operations. PL/SQL: Blocks – Architecture – Variables – Data Types-Control Structures – Exceptions – Triggers - Types of Triggers.

TEXT BOOKS

1. Scott Warner - Teach Yourself Visual Basic 6.0 – Tata Mc Hill, New Delhi, 1999
2. Alexis Leon & Mathews Leon, "Database Management Systems" Leon Vikas Publishing Chennai, 2002

REFERENCE BOOKS

1. Gary Cornell – Visual Basic 6 from the Ground up – TMH, New Delhi, 1999
2. Mastering Visual Basic 6 – Evangel Pertoutsos – BPB Publishers.
3. Raghu Ramakrishnan& Johannes Gehrke, "Database Management Systems", 2nd Edition, McGraw Hill International Edition, 2000
4. Silberschatz , Korth, Sudarshan, "Database System Concepts" , 4th Edition, McGraw Hill International Edition.

LAB: Client Server

Hours: 6hrs/week 90 Hrs **Sub. Code: P21CCP31** **Credits: 3**

Objectives:

- To create small client server applications.
- To know the fundamental concepts of transaction processing.

SQL:

1. Data Definition Language (DDL) Commands.
2. Data manipulation Language (DML) Commands.
3. Query using Aggregate, Date, String Functions
4. Correlated and Nested subqueries.
5. Join operations.

PL/SQL:

7. Implement PL/SQL Program using control statements.
8. Implement PL/SQL Program using Exception
9. Implement PL/SQL Program using Triggers.

VISUAL BASIC:

10. Program to implement Inventory Control using Data control.
11. Program to implement Employee Pay Bill preparation using DAO.
12. Program to implement Electricity Bill calculation using ActiveX Control.
13. Program to implement Telephone Bill calculation using Grid Control.
14. Generate Report.

IV – SEMESTER

FINANCIAL ANAGEMENT

Hours: 6/week 90 Hrs **Sub.Code:** P21CCC41 **Credits: 5**

OBJECTIVE:

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 Functions – Role of Finance Manager.

Unit -2 **(18-Hours)**

Capital Budgeting – Principles and Techniques – Payback Period (PBP) Method – Average Rate of Return (ARR) Method – Discounted Cash Flow (DCF) Method–Net Present Value (NPV) Method – Internal Rate of Return (IRR) Method – Profitability Index (PI) Method– 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 - 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.

Note: Question paper should provide 60% credit to problems and 40% credit to theory.

TEXT BOOKS

1. S.N. Maheshwari - Financial Management, Sultan Chand & Sons (2010).
2. Khan and Jain - Financial Management, Tata Mcraw Hill Education Pvt Ltd. (2010).

REFERENCE BOOKS

1. Prasanna Chandra - Financial Management, Tata Mcraw Hill Education Pvt Ltd. (2011).
2. CA.C.Rama Gopal – Financial Management, New Age International Publication (2008).
3. V.K.Bhalla – Financial Management and policy Text and Cases, Anmol Publication (2010).

GOODS AND SERVICES TAX AND CUSTOMS DUTY

Hours: 6/week 90 Hrs **Sub. Code: P21CCE41** **Credits: 5**

OBJECTIVE

To enable the learners to understand the structure of Indirect taxes and Get knowledge on the recent changes made in the indirect taxation.

Unit- I **(18 hours)**

Indirect Tax – Introduction – Features of Indirect Tax - Problems of Indirect Taxes – Need for Introduction of GST – Meaning of the term GST –Features- Dual Model of GST – Central GST (CGST) - State GST (SGST) - IGST (Integrated Goods Service Tax)

Unit - II **(18 hours)**

GST Administration - Difference between Value Added Tax and Goods Services Tax – Meaning of Registration – Types of Registration – Casual Taxable Person – Form Filling Process in GSTR1 – GSTR2A – GSTR3B – GSTR4 - Reverse Charge Mechanism.

Unit - III **(18 Hours)**

E-Way Bill – Introduction – Rules and Regulation – Goods & Services Tax Council – GST Slab rate - Assessment of GST- Self-assessment – Provisional assessment – Scrutiny of returns – Assessment of non-filers of returns – Assessment of unregistered persons – Assessment in certain special cases – Tax Invoice.

Unit - IV **(18 hours)**

Customs Act 1962 – Definitions – Importance of Customs Duty – Administrative aspects of Customs - Types of Customs Duty –Importation and Exportation and transportation of Goods-Valuation of Goods for Customs Duty – Transaction Value – Assessable Value.

Unit - V **(18 hours)**

Appeals and Revisions – Settlement Commission –Refund-Application for refund of Import Duty or Interest - Processing of Refund Claim - Provisions relating to illegal import and export.

TEXT BOOKS

1. Background Material for Goods and Service Tax. July, 2016. National Academy of Customs Excise and Narcotics.
2. Mehrotra and Goyal. 2017. Indirect Taxes. 58th Edn. SahityaBhavan Publications, Agra.
3. Praveen B.Patil & Mubin A. Sayyed Goods and Services Tax – I 2018. Sri Sai Publications, Balagavi.
4. Praveen B.Patil & Mubin A. Sayyed Goods and Services Tax – II 2018. Sri Sai Publications, Balagavi.

REFERENCE BOOKS

1. Radhakrishnan, P. 2016. Indirect Taxation, 3rd Edn. Kalyani Publishers, New Delhi.
2. Balachandran, V. 2016. Indirect Taxation, 17th Edn. Sultan Chand and Sons, New Delhi.

FINANCIAL DERIVATIVES

Hours: 6/week 90Hrs **Sub. Code: P21CCC42** **Credits: 4**

OBJECTIVE:

To gain the knowledge about the basics of share market, Financial Derivatives, Future Markets and Option Strategies.

Unit-I **(18 hours)**

Introduction to Derivatives: Development and Growth of Derivative Markets, Types of Derivatives, Uses of Derivatives, Financial and Derivative markets - Fundamental linkages between Spot & Derivative Markets, The Role of Derivatives Market, Uses & Misuses of Derivatives.

Unit-II **(18 hours)**

Future and Forward Market: Structure of Forward and Future Markets, Mechanics of Future Markets, Hedging Strategies, Using Futures. Determination of Forward and Future prices - Interest rate futures, Currency Futures and Forwards.

Unit-III **(18 hours)**

Options: Distinguish between Options and Futures – Structure of Options Market, Principles of Option Pricing – Option Pricing Models: The Binomial Model, The Black – Scholars Merton Model.

Unit-IV **(18 hours)**

Basic Option Strategies: Trading with Options, Hedging with Options, Currency Options.

Unit-V **(18 hours)**

Swaps: Concept and Nature - Evolution of Swap Market - Features of Swaps - Major Types of Swaps - Interest Rate Swaps, Currency Swaps, Commodity Swaps, Equity Index Swaps, Credit Risk in Swaps, Using Swaps to Manage Risk, Pricing and Valuing Swaps.

Text Books

1. Financial Derivatives and Risk Management, OP Agarwal, HPH
2. Commodities and Financial Derivatives, Kevin, PHI
3. Fundamentals of Financial Derivatives, Swain.P.K, HPH

References

1. Financial Derivatives, Mishra: Excel.
2. Risk Management & Derivatives, Stulz, Cengage.
3. Derivatives and Risk Management, Jayanth Rama Varma: TMH.

WEB DESIGN

Hours: 6/week 90 Hrs **Sub. Code: P21CCC43** **Credits: 4**

Objectives

- To make the students to create web pages
- To be familiar with scripting languages
- To understand HTML concepts

Unit – I **(18-hours)**

Internet Basics: Introduction -Meaning –History of Internet – Internet Services and Accessibility – Uses of Internet – Protocols – Web Concepts – Internet Standards.

Internet Protocols: Meaning – Internet Protocols – Host Names – Internet Applications and Application Protocols: HTTP – FTP – Telnet - SMTP

Unit -II **(18-hours)**

HTML: Introduction - Information files creation – Web server – Web Client / Browser – Hyper Text Markup Language (HTML) – Commonly used HTML commands. **Lists:** Types of Lists.

Adding Graphics to HTML Documents: Using the BORDER Attribute – Using the WIDTH and HEIGHT Attribute – Using the ALIGN Attribute – Using the ALT Attribute.

Unit – III **(18-hours)**

Tables: Introduction – Using the WIDTH and BORDER Attribute – Using the CELLPADDING Attribute – Using the CELLSPACING Attribute – Using the BGCOLOR Attribute – Using the COLSPAN and ROWSPAN Attributes.

Linking Documents: Links – Images As Hyperlinks.**Frames –** Introduction – <FRAMESET>Tag - <FRAME> Tag

Unit – IV **(18-hours)**

Java Script: Introduction , JavaScript in Web Pages – JavaScript – Writing Java Script into HTML – Basic Programming Techniques – Operators - Expressions in Java Script – JavaScript Programming Constructs - Conditional Checking – Super Controlled-Endless Loops

Unit – V **(18-hours)**

Functions in JavaScript– User Defined Functions – Placing Text in a Browser – Dialog Boxes.

Forms used in a Website: Form Objects – Other Built-in Objects in JavaScript – User Defined Objects.

TEXT BOOKS

1. Web Technology A Developer's Perspective, N.P.Gopalan and J. Akilandeswari, PHI Learning Private Limited, 2010.
2. Web Enabled Commercial Application Development Using HTML, DHTML, JavaScript, Perl CGI, Ivan Bayross, BPB Publications, 3rd Revised Edition.

UNIT	CHAPTERS	PAGE NO.
I	(In Book 1) 1 - 2	1 – 32
II	(In Book 2) 2, 3, 4	12 – 45

III	(In Book 2) 5, 6, 7	47 – 84
IV	(In Book 2) 8	124 – 138
V	(In Book 2) 8, 10	139 – 149, 160 - 190

REFERENCE BOOKS

1. Internet and World Wide Web – How to Program, Deital&Deital, Pearson Education, Third Edition, 2004.
2. Web Technologies, Black Book, Dreamtech press, Reprint edition, 2011.

PROJECT WORK AND VIVA-VOCE

Hours: 6/week 90 Hrs **Subject Code: P21CC4PV** **Credit: 3**
Internal: 50 Marks **EXTERNAL Viva -Voce: 50Marks**

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 both internal and external 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 format / certificate for project report to be submitted by the students are given below:

Format for the preparation of project report:

a. Title page
b. Declaration by the Student
c. Acknowledgement
d. Table of contents
e. Text of the project
f. Bibliography
g. Appendix

Course Name : **Bachelor of Science**
Discipline : **PHYSICS**
(For those who joined in June 2021 and after)

Course Objectives:

- Nowadays most of the students prefer to join Professional Colleges after completing their higher secondary School studies. Only limited students wish to join Science Colleges.
- The curriculum of B.Sc. Physics programme is now carefully designed to create interest in Physics and in order to prepare the students to meet the challenges of Society locally or globally.
- After the successful completion of this course, a B.Sc. degree holder would be able to face various competitive examinations and take up any job requiring the graduateship.
- Also, the degree holder will become equipped to undergo various post graduate courses in Physics and related subjects and to give full assistance to researchers in various research and development laboratories.

Semester	Subject	Hour	Credit	Int. + Ext. = Total	Subject Code	Focus on Employability/ Entrepreneurship/ Skill Development	Revised/ New/ No Change/ Interchanged If Revised % of Change
I	Part I – இக்கால இலக்கியம்	6	3	25+75=100	U3PT1		No Change
	Part II - English – Paper – I	6	3	25+75=100	U3PE1		No Change
	Core 1 - Mechanics and Relativity	4	4	25+75=100	U2PHC1		No Change
	Core (Major) LAB: General Physics 1	2	-	-	-		-
	Ancillary - Algebra and Trigonometry	6	5	25+75=100	U2MAA1X1		No Change
	SBS1 Solar Thermal and Photovoltaic systems	2	2	25+75=100	U4PHS11		Revised/100%
	SBS2 Materials Science	2	2	25+75=100	U3PHS12		No Change
	Value Education	2	2	25+75=100	U1VE11		No Change
II	Part II – அற இலக்கியமும் காப்பிய இலக்கியமும்	6	3	25+75=100	U2PT2		No Change
	Part II - English- Paper – II	6	3	25+75=100	U3PE2		No Change
	Core 2 - Properties of Matter and Sound	4	4	25+75=100	U3PHC21		No Change
	Core 3 – Heat and Thermodynamics	4	4	25+75=100	U3PHC22		No Change
	Core (Major) LAB: General Physics 1	2	2	40+60=100	U3PHC2P		No Change
	Ancillary - Calculus and Matrices	6	3	25+75=100	U2MAA2X2		No Change
	Environmental Studies	2	2	25+75=100	U1ES21		No Change

COURSE : I B.Sc. PHYSICS **SOLAR THERMAL AND PHOTOVOLTAIC SYSTEMS** Hours : 2

SEMESTER : I SKILL BASED PAPER 1 Credit : 2

Contact hours per Week – 2 hours

Contact hours per Semester – 30 hours **Subject Code:**U4PHS11

Objectives:

- To understand the fundamentals and need for conventional Energy Sources and non-conventional Energy Sources.
- To study about Sun and Solar radiation.
- To learn about Solar collector, Solar water heater and Solar Cookers.
- To learn about Solar Furnaces, Solar Dryer and Solar Distillation.
- To study the Solar PV systems and their applications.

Unit I: Fundamental of Energy – science and technology

Energy Consumption & Standard of living - Classification energy sources – Consumption trends of primary energy Sources – Importance of Non Conventional Energy Sources - Advantage and disadvantage of conventional Energy Sources - Salient Features of Non-Conventional Energy Sources.

Unit II: Solar Energy - Basics

The Sun as a Source of energy – The Earth – Sun, Earth radiation Spectrum – Measurements of Solar radiation.

Unit III: Solar Thermal System

Solar Thermal System – Solar collector – Solar water heater – Solar Cookers

Unit IV: Solar Thermal System

Solar Furnaces - Solar Green house - Solar Dryer – Solar Distillation.

Unit V: Solar Photovoltaic System

Solar Photovoltaic systems – Solar cell fundamentals – Solar cell, Module, Panel and Array construction – Solar PV systems – Solar PV Applications.

Text Book:

B. H. Khan. ***Non conventional energy sources***. New Delhi: Tata Mcgraw Hill (P) Ltd. 2006.

Unit I : Chapter 1 – 1.1, 1.3, 1.4, 1.5, 1.8, 1.9

Unit II : Chapter 4 – 4.1, 4.2, 4.3, 4.7

Unit III: Chapter 5 – 5.1, 5.2, 5.6

Unit IV: Chapter 5 – 5.7 - 5.10

Unit V : Chapter 6 – 6.1, 6.4, 6.8, 6.9

Course Name : Bachelor of Science
Discipline : Physics
CHOICE BASED CREDIT SYSTEM
(For those who join in June 2019 and after)

Semester	Part	Subject	Hour	Credit	Int+Ext= Total	Subject Code	Focus on Employability/ Entrepreneurship/ Skill Development	Revised/ New/ No Change/ Interchanged If Revised % of Change
V	Core	Core 6 - Analog Electronics	4	4	25+75=100	U2PHC51	Employability	No Change
	Core	Core 7 – Optics & Spectroscopy	4	4	25+75=100	U2PHC52	Employability	No Change
	SBS	SBS 3 - Electrical Wiring	2	2	25+75=100	U1PHS51	Entrepreneurship	No Change
	SBS	SBS 4 - Physics of Human Anatomy	2	2	25+75=100	U1PHS52	Skill Development	No Change
	Core	NME 1 - Basic Physics	2	2	25+75=100	U2PHN51	Employability	No Change
	Core	LAB : Core (Major) Lab 3 – General Physics	3	-	-	-	-	-
	Core	LAB : Core (Major) Lab 4 – Electronics	3	-	-	-	-	-
	NME	LAB : Core (Major) - Project & Area Study	2	-	-	-	-	-
	Allied	General Chemistry-III	4	4	25+75=100	U2CHA5X3		No Change
		Employability Skills	2	2	25+75=100	U1PS51	Skill Development	No Change
		LAB: Organic Analysis	2	-	-	-		
VI	Core	Core 8 - Atomic & Nuclear Physics	4	4	25+75=100	U1PHC61	Employability	No Change
	Core	Core 9 - Digital Electronics	4	4	25+75=100	U3PHC62	Employability	No Change
	Core	Core 10 - Classical & Statistical Mechanics	4	4	25+75=100	U4PHC63	Entrepreneurship	No Change
	SBS	SBS 6 - Biomedical Instrumentation	2	2	25+75=100	U2PHS61	Entrepreneurship	No Change
	Core	NME 2 - Solar Energy	2	2	25+75=100	U2PHN61	Employability	No Change
	Core	LAB :Core (Major) Lab 3 – General Physics	3	5	40+60=100	U2PHC6P1	Skill Development	No Change
	Core	LAB : Core (Major) Lab 4 – Electronics	3	5	40+60=100	U4PHC6P2	Skill Development	Revised
	NME	Core (Major) - Project & Area Study	2	5	100 (Internal only)	U3PH6PR	Skill Development	No Change

	Allied	General Chemistry-IV	4	4	25+75=100	U3CHA6X4		
	Allied	LAB: Organic Qualitative Analysis	2	2	40+60=100	U1CHA6PX 2		

Self-Learning Course:

Semester	Subject	Credit	Ext =Tot	Subject Code
V	Renewable Energy Sources	5	100 = 100	U1PHSL51

COURSE : III B.Sc. PHYSICS **ELECTRONICS** Hours : 3
SEMESTER : V & VI Core Lab (Major) Credit : 5
Contact hours per Week – 3 hours
Contact hours per Semester – 30 hours **Subject Code: U4PHC6P2**

1. Characteristics of Zener diode.
2. Construction and study of Bridge rectifier with π filter.
3. Construction and study of Voltage Doubler and Tripler.
4. Characteristics of Transistor (CE mode).
5. Construction and study of Single Stage Amplifier.
6. Construction and study of Hartley Oscillator.
7. Regulated power supply using IC 7805.
8. Verification of De Morgan's Laws.
9. NOR gate as a universal building block.
10. NAND gate as a universal building block.
11. Construction and study of Integrator and Differentiator circuits using IC 741.
12. Construction and study of Adder and Subtractor circuits using IC 741.
13. Construction and study of R-S & J-K flip flop using gates.
14. Study of I-V characteristics of Solar Photovoltaic Module with varying radiations.
15. Study of I-V characteristics of Solar Photovoltaic Panels in (i) Series Connection and (ii) Parallel Connection.

Course Name: Bachelor of Science
Discipline: Botany
(For those who join in 2021 and after)

COURSE OBJECTIVES

The objective is to recognize that curriculum, course content and assessment of scholastic achievement play complementary roles in shaping education. The restructured Curriculum for Undergraduate Programme of Botany envisages Undergraduate Education as a combination of general and specialized education, simultaneously introducing the concepts of breadth and depth in learning .It also stresses learning to learn rather than learning of specific lessons. The attempt is to prepare the students for lifelong learning by drawing attention to the vast world of knowledge of plants and introducing him/her to the methodology of systematic academic enquiry. With this in mind, we aim to provide a firm foundation in every aspect of Botany and to explain a broad spectrum of modern trends in Botany and to develop experimental, observational, computational skills also which lead him as an ambassador of sustainable development of our country.

1. Know the importance and scope of the discipline, inculcate interest in and love of nature with its myriad living forms
2. Impart knowledge of Science as the basic objective of Education
3. Develop a scientific attitude to make students open minded, critical and curious
4. Develop an ability to work on their own and to make them fit for the society
5. Expose themselves to the diversity amongst life forms
6. To develop skill in practical work, experiments, equipments and laboratory use along with collection and interpretation of biological materials and data
7. Make aware of natural resources and environment and the importance of conserving it.

Eligibility for admission

Higher secondary students with Biology as Background

Duration of the course : Three years

Course Scheme

Sem	Subject	Hour	Credit	Int+Ext =Total	Subject Code
I	Tamil /Hindi	6	3	25+75 =100	U2PT1
	English	6	3	25+75=100	U2PE1
	Core- I Algae and Bryophytes	4	4	25+75=100	U3BYC1
	Core-I LAB: Algae and Bryophytes	2	**1**	40+60 =100	U2BYC1P
	SBE 1:Horticulture	2	2	25+75=100	U2BYS11
	SBE 2:Embryology of Angiosperms	2	2	25+75=100	U2BYS12
	Anc.: General Chemistry I	4	4	25+75=100	U3CHA1Y
	Anc.: LAB: Volumetric Analysis	2	-	---	-
	Value Education	2	2	25+75=100	U1VE11

Sem	Subject	Hour	Credit	Int+Ext =Tot	Subject Code
II	Tamil /Hindi	6	3	25+75=100	U2PT2
	English	6	3	25+75=100	U2PE2
	Core - II - Herbal Technology	4	4	25+75=100	U2BYC2
	Core II -LAB: Herbal Technology	2	1	40+60=100	U2BYC2P
	SBE 3: Plant Ecology and Phytogeography	2	2	25+75=100	U2BYS21
	SBE 4: LAB: Techniques in Cell Biology	2	2	40+60=100	U1BYS2P
	Anc.: General Chemistry II	4	4	25+75=100	U3CHA2Y
	Anc.: LAB: Volumetric Analysis	2	2	40+60=100	U2CHA2YP
	Environmental Studies	2	2	25+75=100	U1ES21

Year	Part	Subject	Credit	Int=Total	Code
I & II	Part V	NSS/ NCC/ Physical Education – Sports/YRC/RRC	1	100=100	U2NS4/ U2NC4/ U2PS4/ U1YR4/ U1RR4

CORE II – ALGAE AND BRYOPHYTES

Hours: 4 hrs / week (60 hrs) **Subject Code: U3BYC1** **Credit: 4**

Course Objectives:

To understand the salient features, life cycle pattern of selected Algae and Bryophytes and their economic importance.

Algae

Unit I **12-Hrs**

General characters of Algae, Classification of algae by Fritsch, Economic importance of Algae.

Unit II **12-Hrs**

Study of the distribution, structure, reproduction and life history of the following Genera:

i) *Oscillatoria*
ii) *Caulerpa*
iii) *Vaucheria*

Unit III **12-Hrs**

Study of the distribution, structure, reproduction and life history of the following Genera:

i) Pennate Diatoms
ii) *Sargassum*
iii) *Polysiphonia*

Bryophytes

Unit IV **12-Hrs**

General characters of Bryophytes ,Classification of Bryophytes by Rothmaler. Morphology, reproduction and structure of Gametophyte and Sporophyte of the following genera

1) *Marchantia*

Unit V **12-Hrs**

Morphology, reproduction and structure of Gametophyte and Sporophyte of the following Genera

i) *Anthoceros*

ii) *Polytrichum*

Economic importance of Bryophytes.

Text Books:

1. Vasishta, B.R. Algae - S.Chand & Co. Ltd, New Delhi
2. Pandey, B.P. College Botany - Algae, Fungi and Bryophyta Vol.1 S.Chand & Co. Ltd, Ram Nagar, New Delhi.
3. Vasishta B.R. et al, 2010. Bryophyta - S Chand & Co., Ltd, New Delhi.

Reference Books:

1. Fritsch, F.E, 1956 - The Structure and Reproduction of the Algae Vol.1 & II Vikas Publication, New Delhi.
2. Bhatia, K.N, 1975. Treatise on algae - S.Chand & Co. Ltd, New Delhi
3. Chopra, G.L, 2969, - A text book of algae, S.Nagin & Co, New Delhi
4. Gupta,J.S, 1987- A text book of algae, S.Nagin & Co, New Delhi
5. Sharma, O.P., 2008. Text book of algae, Tata Mv Graw - Hill publishing company Ltd, New Delhi.
6. Smith, G.M., 1958. Cryptogamic Botany Vol.11, Tata Mv Graw - Hill publishing company Ltd, New Delhi.
7. Parihar N.S., 1985. An Introduction to Bryophytes Vol.1, Central book Depot, Allahabad.

Core Paper – I – LAB: Algae and Bryophytes

Hours: 2 hrs / week **Subject Code: U2BYC1P** **Credit: 1**

Algae:

To study the external and internal structure of the thallus and the reproductive structure of the following groups:

Cyanophyceae – *Oscillatoria.*
Chlorophyceae – *Caulerpa*
Xanthophyceae – *Vaucheria*
Bacillariophyceae – *Pennate diatom*
Phaeophyceae – *Sargassum*
Rhodophyceae -*Polysiphonia*.

Bryophytes:

Study of the external and internal structure of the Gametophyte and the structure of Sporophyte of the following groups:.

Hepaticopsida - *Marchantia*,
Anthocerotopsida - *Anthoceros*
Bryopsida - *Polytrichum*

Semester - II

CORE - II - HERBAL TECHNOLOGY

Hours/week: 4 **Subject Code:** U2BYC2 **Credit: 4**

Course objectives:

- To impart knowledge on herbal medicine.
- To develop a scientific attitude towards the study of herbal medicines.
- To expose the students to different pharmaceutical industries and research institutes.
- To develop skill in experiments and usage of equipment in herbal products preparation and their utilization.
- To understand ethical principles in herbal medicine research.

Unit I:

Introduction and scope of Ethnobotany and Ethnomedicine; identification and authentication of herbs, Different dosage forms of herbal drugs, Evaluation of different dosage forms, Stability studies of herbal formulations. Adulteration of Raw Drugs & Detection, Basics of Herbal Drug Standardization.

Unit-II:

Herbal Care Products: Hair care - Formulation of Shampoos, Conditioners, Setting lotion, Hair creams, Hair dyes. Skin Care - Formulation of skin cleansers, moisturizers, acne products. Dental products - Oral rinses, Tooth powder, Tooth paste.

Unit-III

Preparation of Herbal medicine/ Products - Herbal Tea, Herbal Infusion, Herbal Tincture and Ointments, Eucalyptus oil, *Aloe vera* gel and Triphala Churna.

Unit IV

Organoleptic properties of crude drugs. Endomorphological characters of crude drugs: Trichomes, Various types of Stomata and their frequency, stomatal index, Vein islet and Vein termination number. Simple permanent tissues, Complex tissues.

Unit V

Pharmacognostical standardization of the following plants with special reference to anatomical features.

- Stem- *Boerhaavia diffusa*, *Achyranthes aspera* and *Begonia malabarica,*

Root –*Rauvolfia serpentina,*
Leaf – *Piper betle*

Reference

1. G.E.Treese nad W.C.Evans, Text book of Pharmacognosy, 15th edn, W.B. Saunders Edenburg, NewYork.
2. C.K.Kokate, Purohit, Ghokhale, Text book of Pharmacognosy, 5th edn Nirali Prakassan. 1996.
3. Pharmacognosy, Phytochemistry, Medicinal Plants by Jean Bruneton, 2nd Revised edition
4. Varro E. Tyler, Lynn R. Brady, James E. Robbers, Pharmacognosy,Intercept Ltd; Edward Praegner Claus.
5. Pulok K. Mukherjee, Quality Control and Evaluation of Herbal Drugs: Evaluating Natural Products and Traditional Medicine, Elsevier Science, United States, 2019.

6. Anil K. Sharma, Raj K. Keservani, Surya Prakash Gautam, Herbal Product Development: Formulation and Applications, Apple Academic Press, United States, 2020.

Core Practical - II- LAB: HERBAL TECHNOLOGY

Hours/week: 2 **Subject Code:** U2BYC2P **Credit: 1**

Practical Syllabus

1. Preliminary phytochemical screening of secondary metabolites.
2. Determination of ash values of drugs.
3. Study of stomatal frequency and index
4. Study of Vein termination number and vein islet number
5. Organoleptic properties of crude drugs
6. Determination of adulterants of selected crude drugs by Fluorescent analysis
7. Preparation of selected herbal based formulations

i. Shampoos
ii. Tooth powder
iii. Hair oil
iv. Bath powder
v. Decoction (Kasayam)
vi. Churanam

8. Pharmacognostical standardization of the following plants with special reference to anatomical features.

Stem- *Boerhaavia diffusa*, *Achyranthes aspera* and *Begonia malabarica,*

Root –*Rauvolfia serpentina,*

Leaf – *Piper betle*

A field study / trip or research institute / universities / industrial visit should be carried out for atleast Three days.

HERBAL TECHNOLOGY

Duration - 3 Hrs **Practical Question Pattern** **Max.Marks = 60**

1. Study the Pharmacognostic features of given sample **A** 1 x 10 = 10
2. Identify the drug, observing the organoleptic properties for the given samples **B and C** 2 x 5 = 10
3. Detection of adulterants in the sample **D** by fluorescent analysis method 1 x 10 = 10
4. Preparation any one herbal formulations as in the lot **E** 1x5 =5
5. Spot at sight F ,G and H 3x5 = 15
6. Submission of herbal product 5 Marks
7. Submission of Record note. 5 Marks

Key and Scheme of Valuation

1. Section -3 Marks Identification – 1 Marks Diagram – 3 Marks, Notes – 3 Marks
2. Identification – 2 Marks, Notes – 3Marks
3. Methodology – 5 Marks Explanation – 5 Marks
4. Materials required - 1 Mark procedure – 4 marks
5. Identification – 1 Mark, Notes – 4 Marks
6. Submission of herbal products – 5 Marks
7. Submission of records – 5 Marks

SKILLED BASED IV - Techniques In Cell Biology

Hours: 2 hrs / week (30 hrs) **Subject Code:** U1BYS2P **Credit: 2**

Course objectives

- To know about the principles and working of microscopes
- To train the students to measure the objects and count the cells viewed under microscope.
- To know the various structures present in the plants
- To make the students to preserve the plant material sections
- To understand the various stages of cell division

List of Practical:

1. Study of Structure and working principles of Dissecting microscope, Compound microscope and Phase contrast microscope.
2. Study of Principles and calibrations of Ocular micrometer, Stage micrometer, Haemocytometer and Photomicrograph.
3. Identification of epidermal appendages - Glands, trichomes and stomatal types.
4. Study of simple and complex tissues through Maceration technique.
5. Study on ergastic substances – starch grains, raphides, druses and cystolith.
6. Staining of Eukaryotes and Prokaryotes - Simple staining, Double staining and Gram staining.
7. Observation of stages in Mitosis and Meiosis
8. Isolation of plant genomic DNA.

Reference

1. Singh Dinesh. (2018), Tools and Techniques of Cell Biology Hardcover, Kalyani Publishers, New Delhi.
2. Bruce Alberts *et al.* (2004). Molecular Biology of the Cell.4th Edition, Garland United States.
3. Hawes and Jeunemaitre (2001). Plant Cell Biology: A Practical Approach, 2nd edition, Oxford University Press.
4. Harris, N. and Oparka K. J. (1994). Plant Cell Biology (A Practical Approach),Oxford University Press.
5. Ambrose, E.J and Dorothy, M.E. (1970), Cell Biology, ELBS CAMLOT Press.

Techniques In Cell Biology
Practical Question Pattern

Duration : 3 Hours **Max.Marks : 75**

1. Identify the type of epidermal appendage in the given material **'A' and 'B'** 2x5=10
   (Identify, draw diagrams and give reasons.)
2. Identify the type of stomata in the given material **'C'** 1 x 8 = 8
   (Identify, draw diagrams and give reasons.)
3. Carry out the maceration technique for given material **'D'** and identify any two types of cells of complex tissue. Give the procedure in flow chart, submit the slides for valuation. 1 x15 = 15
4. Make temporary preparation for **'E' and 'F'.** Identify and give critical notes on the type of ergastic substance present in it. Submit the slides for valuation. 2 x 6 =12
5. Identify and write critical notes on **'G' and 'H'**. 2 x 5 = 10
6. Submission of Observation book 20 Marks

Key and Scheme of Evaluation

1. Any leaf/stem 'A' and 'B' 2x5=10 marks
(Identification – 1, diagram – 2, reasons – 2)
2. Any leaf'C' 1 x 8 = 8 marks
(Slide - 3, Identification – 1, diagram – 2, reason – 2)
3. Stem - Maceration technique for 'D' 15 marks
(Procedure – 5, Slide – 5, Identification – 5 (2x2 $^{1/2}$))
4. Leaf/ Stem/grains 'E' and 'F' 2 x 6 = 12 marks
(Identification – 1, slide – 3, notes – 2)
5. Microscopes/Ocular micrometer/Stage micrometer/ Haemocytometer - 'G' and 'H'.
(Identification – 1, Notes – 4) 2 x 5=10marks
6. Submission of Observation book 20 marks

Course Name : Bachelor of Science
Discipline : Zoology
(For those who joined in June 2021 and after)
COURSE SCHEME:

Semester	Part	Subject	Hour	Credit	Int+Ext= Total	Subject Code	Revised / New / No Change / Interchanged & Percentage of revision 2021-2022	Courses having focus on employability/ entrepreneurship/ Skill development
I	Part–I	Tamil/Hindi	6	3	25+75=100		-	
	Part–II	English	6	3	25+75=100	U3PE1	-	
	Core1	Invertebrata	4	4	25+75=100	U3ZYC1	No Change	
	Core Lab	Invertebrata Practical	2	-	-	-	-	
	AlliedI–1	General Chemistry I	4	4	25+75=100	U3CHA1Y	No Change	
	Allied I–1 Lab	Chemistry Practical	2	-	-	-	-	
	SBE–1	Animal Diversity and Adaptation-I	2	2	25+75=100	U3ZYS11	No Change	
	SBE–2	Applied Zoology-I	2	2	25+75=100	U3ZYS12	No Change	
	VE	Value Education	2	2	25+75=100	U1VE11	No Change	
II	Part–I	Tamil/Hindi	6	3	25+75=100		-	
	Part–II	English	6	3	25+75=100	U3PE2	-	
	Core2	Chordata	4	4	25+75=100	U3ZYC2	No Change	
	Core Lab	**LAB: Invertebrata and Chordata**	**2**	**2**	**40+60=100**	**U4ZYC2P**	Revised / 10%	
	Allied I–2	General Chemistry II	4	4	25+75=100	U3CHA2Y	No Change	
	Allied I -2 Lab	Chemistry Practical– Volumetric Analysis	2	2	40+60=100	U2CHA2YP	No Change	
	SBE–3	Animal Diversity and Adaptation-II	2	2	25+75=100	U3ZYS21	No Change	
	SBE–4	Applied Zoology-II	2	2	25+75=100	U3ZYS22	No Change	
	EVS	Environmental Studies	2	2	25+75=100	U1ES21	No Change	

Year	Part	Subject	Credit	Int=Total	Code
I & II	Part V	NSS/ NCC/ Physical Education – Sports/YRC/RRC	1	100=100	U2NS4/ U2NC4/ U2PS4/ U1YR4/ U1RR4

LAB: INVERTEBRATA AND CHORDATA

(Summative Exam to be done at the end of the Second Semester)

Contact hours per week – 2 hours **CREDITS: 2**

Contact hours per semester – 30 hours **Subject Code: U4ZYC2P**

INVERTEBRATA

DISSECTIONS

Earthworm: Nervous System – Demonstration only
Cockroach: Digestive System and Nervous System – Demonstration only
Pila: Digestive system – Book plate/ Model

MOUNTINGS

Earthworm: Body Setae
Cockroach: Trachea
Mosquito: Mouth Parts
Pila: Radula – Book plate/ Model

SPOTTERS

Protozoa: *Paramecium* – Conjugation; *Euglena, Entamoeba, Plasmodium*.
Porifera: Simple *Sponge*; *Sponge* – Gemmule; *Sponge* – Spicules
Coelenterata: *Obelia* colony, *Obelia* medusa, *Aurelia*, *Physalia*, *Sea anemone*
Helminthes: Liver fluke, *Redia* larva, *Cercaria* larva, *Ascaris* (Male and Female)
Annelida: *Earthworm*, *Nereis*, *Heteroneris*, *Chaetopterus*
Arthropoda: Cockroach, Scorpion, Centipede, Peripatus
Mollusca: Pila, Fresh water mussel, Chiton, Sepia, Solen
Echinodermata: Starfish, Sea-urchin, Sea-cucumber, Brittle star, Bipinnaria larva

CHORDATA

DISSECTIONS

Frog- Digestive system- Book plate/ Model only
Calotes – Arterial System and Venous System – Book plate/ Model only

MOUNTINGS

Scales from an edible fish available in the market
Rabbit: Brain – Book plate/ Model

SPOTTERS

Prochordata: *Amphioxus*; *Amphioxus –Balanoglossus, Ascidian*
Agnatha: *Petromyzon*
Pisces: *Narcine, Echeneis, Hippocampus, Eel, Catla, Tilapia*
Amphibia: *Bufo, Rhacophorus, Ichthyophis, Salamander*
Reptilia: *Poisonous snakes*: Cobra, Krait and Viper: *Non – Poisonous Snakes*: Dryophis and ptyas; *Calotes, Chameleon* and *Draco*
Aves: *Pigeon,* Pectoral and Pelvic girdle of *Pigeon*, *Archaeopteryx*
Mammals: *Bat, Loris*
Inclusion – Industrial Visit to Marine Environment to collect specimens and visit to ornamental fish farm, vermiculture farm etc.,

Course Name : Master of Science
Discipline : ZOOLOGY
(For those who joined in June 2021 and after)

COURSE OBJECTIVES

- To impart education to graduates in Zoology so as to equip them to interpret the ecosphere around them and to solve the problems in conservation biology.
- To combine theoretical knowledge and practical skills to equip the student to take up active research in the area of modern biology.
- To produce trained manpower with strong knowledge base in various disciplines of Zoology.
- To encourage the students to become entrepreneurs in the applied areas of Zoology
- To improve the skills of students in the advanced molecular techniques.

ELIGIBILITY FOR ADMISSION

B.Sc. Graduates of any University with Zoology /Life Sciences / Biological Sciences/Animal Sciences etc as principal subject.

DURATION OF THE COURSE

The Course for the Degree of Master of Science shall consist of two academic years divided into four semesters.

Each semester consists of 90 working days.

COURSE SCHEME:

Semester	Part	Subject	Hour	Credit	Int+Ext= Total	Subject Code	Revised / New / No Change / Interchanged & Percentage of revision 2021-2022	Courses having focus on employability/ entrepreneurship/ Skill development
I	Core 1	Cell and Molecular Biology	6	4	40+60=100	P19ZYC11	No Change	
	Core 2	Biochemistry and Biophysics	6	4	40+60=100	P19ZYC12	No Change	
	Core 3	Techniques in Biology	6	4	40+60=100	P19ZYC13	No Change	
	Elective-1	Aquaculture	6	4	40+60=100	P19ZYE11	No Change	
	Core 4	LAB: Cell and Molecular Biology	3	3	40+60=100	P19ZYP11	No Change	
	Core 5	LAB : Biochemistry	3	3	40+60=100	P19ZYP12	No Change	
II	Core 6	Molecular Genetics	6	4	40+60=100	P19ZYC21	No Change	
	Core 7	Ecology	6	4	40+60=100	P19ZYC22	No Change	
	Core 8	Biostatistics and Bioinformatics	6	4	40+60=100	P19ZYC23	No Change	
	NME	**Economic Zoology**	**6**	**4**	**40+60=100**	**P21ZYN21**	Revised / 10%	
	Core 9	LAB : Molecular Genetics	3	3	40+60=100	P19ZYP21	No Change	
	Core 10	LAB : Ecology	3	3	40+60=100	P19ZYP22	No Change	

NME - ECONOMIC ZOOLOGY

Contact hours perWeek– 4 hours **Credits:4**
Contact hours per Semester– 60 **Subject Code:P21ZYN21**

Objectives

- To encourage young learners to takeup the small scale industries
- To generate motivation for Self-Employment
- To disseminate information on economic aspects of Zoology
- To inculcate knowledgeon useful animals to Mankind
- To satisfythe learners with modern techniques of Animal culture

Unit – I **(15 hours)**

Dairyfarming: Common cattle breeds- cow,Buffalo and goat (exampleof each one), Management ofamodeldairyfarm-Livestock diseases-Foot and mouth disease, udder disease-Nutritivevalue ofmilk-milk products-Economics.

Unit – II **(15 hours)**

Poultry:-Breeds of fowls-Sexingof onedaychicks-Rearingand management Broilersand layers-Nutritive value of chickand egg– disease control(Raniket, Coryza, fowl poxonly)– Economics

Unit – III **(15 hours)**

Ornamental fish culture–Introduction – common ornamental fishes (blackmoly, Guppy,common gold fish)– construction of fish tank (basecovering, plantand fresh waterset up)– water qualitymanagement– Feedsand methods of feeding– Breeding ofornamental fishes (Guppy ,Gold fish)– fish disease (White spot, gill rot) and treatment–Economics.

Unit – IV **(15 hours)**

Sericulture – Morphology of silkworm *Bombyxmori*– Silkworm rearing–Marketing of cocoons – Economics

Apiculture– Methods of honey beerearing –Nutritive and medicinal valuesof honey-Economics

Unit – V **(15 hours)**

Vermiculture–Introduction– General morphologyofearthworm– Vermicomposting material – *Eiseniafoetida and Eudriluseugeniae*-Steps involved in Vermicomposting(bedding, layering, and watering)– Method of harvesting– Application ofvermicompost– Economics

Resolution

Field Visit/Field Trip to any Research Institute/Specimen collection in Marine coastal area/Aquaculture farm/Vermiculture etc. from the academic year 2021-2022.

Each student should submit the Field visit report as an Assignment and it should be assessed for 5 marks.

Course Name: Master of Computer Applications

Discipline : MCA

Rules and regulations, Course Scheme and Scheme of Examinations
(For those who join in June 2020 and after)

1) Course Scheme :

Semester	Part	Subject	Hour	Credit	Int+Ext = Total	Subject Code	Revised / New / No Change / Interchanged & Percentage of revision	Courses having focus on employability/ entrepreneurship/ skill development
III	Core 12	Cryptography and Network Security	4	4	40+60=100	P20CAC31	New / 100%	Skill Development
	Core 13	Principles of Compiler Design	4	4	40+60=100	P20CAC32	New / 100%	Skill Development
	Core 14	Artificial Intelligence	3	3	40+60=100	P20CAC33	New / 100%	Skill Development
	Core 15	Internet of Things	4	4	40+60=100	P20CAC34	New / 100%	Skill Development
	Elective III	Software Project Management/ Theory of Computation/ Soft Computing	5	5	40+60=100	P20CAE31/ P20CAE32/ P20CAE33	New / 100% New / 100% New / 100%	Skill Development Employability Skill Development
	Core 16 – Lab	LAB :Android Programming	5	3	40+60=100	P20CAP31	New / 100%	Skill Development
	Core 17 – Lab	LAB : Dot Net Programming	5	3	40+60=100	P20CAP32	New / 100%	Skill Development
IV	Core 18	R Programming	4	4	40+60=100	P20CAC41	New / 100%	Skill Development
	Core 19	LAB : Angular JS	4	2	40+60=100	P20CAP41	New / 100%	Skill Development
	Project and Viva-voce	Project and Viva-voce	-	6	100+100=200	P20CA4PV	New / 100%	Employability

Core 12 - Cryptography and Network Security

Contact Hours per Week: 4 **Credits : 4**

Contact Hours per Semester: 48 **Subject Code : P20CAC31**

Course Outcome:

Students, after successful completion of the course, will be able to:

CO1:	To understand the fundamentals of Cryptography.
CO2:	To acquire Knowledge on standard algorithms used to provide confidentiality, integrity and authentication.
CO3:	To understand the various key distribution and management schemes.
CO4:	To understand how to deploy encryption techniques to secure data in transit across data networks.
CO5:	To design security applications in the field of information technology.

Unit I **10 Hrs**

Introduction: Security Goals – Cryptographic Attacks – Services and Mechanism – Techniques for security Goals Implementation.

Traditional Symmetric-Key Ciphers: Symmetric -Key Ciphers - Categories of Traditional Ciphers – Stream and Block Ciphers.

Introduction to Modern Symmetric-Key Ciphers: Modern Block Ciphers – Components of a Modern Block Cipher - Two classes of Product Ciphers - Attacks Designed for Block Ciphers - Modern Stream Ciphers.

Unit II **10 Hrs**

Data Encryption Standard (DES): History of Data Encryption Standard (DES) – DES Structure – Security of DES.

Advanced Encryption Standard (AES): History of Advanced Encryption Standard (AES) – Transformations used by AES – Key Expansion – The AES Cipher – Analysis of AES.

Unit III **8 Hrs**

Asymmetric-Key Cryptography: Difference between Symmetric-Key and Asymmetric-Key Cryptosystems – RSA Cryptosystem.

Message Integrity and Message Authentication: Message Integrity – Random Oracle Model – Message Authentication.

Unit IV **10 Hrs**

Digital Signature: Comparison – Process – Services – Attacks on Digital Signature – Digital Signature Schemes.

Entity Authentication: Entity Authentication and Message Authentication – Passwords-based Authentication – Challenge-Response Protocols – Zero-Knowledge Protocols-Biometrics.

Unit V **10 Hrs**

Key Management: Symmetric-Key Distribution – Kerberos – Symmetric-Key Agreement.

Security at the Application Layer: E-mail System – Secure/Multipurpose Internet Mail Extension (S/MIME).

System Security: Description of the System – Malicious Programs – Intrusion Detection Systems (IDS).

Text Book:

Behrouz A Forouzan, Debdeep Mukhopadhyay. ***Cryptography and Network Security.*** Third Edition; Tata McGraw Hill Education Private Limited; Fifth reprint 2017.

Unit I : Chapter 1, 3, 5
Unit II : Chapter 6 (Page No: 137 - 150, & 156, 157),
Chapter 7 (Page No: 169 - 190 & 192 - 195)
Unit III : Chapter 10 (Page No: 259 - 276, Chapter 11
Unit IV : Chapter 13(Page No: 347 - 365), Chapter 14
Unit V : Chapter 15(Page No: 389 - 402),
Chapter 16 (Page No: 417 – 419, 438 - 447),
Chapter 19 (Page No: 525, 526, 535 - 547)

Reference Books:

1. Atul Kahate. ***Cryptography and Network Security***. Third Edition; McGraw Hill Education Private Limited, Eighth Reprint 2017.
2. William Stallings. ***Cryptography and Network Security***.PHI; 2008.

Core 13 - Principles of Compiler Design

Contact Hours per Week: 4 **Credits : 4**
Contact Hours per Semester: 48 **Subject Code : P20CAC32**

Course Outcomes :

CO1:	To understand the functionality of each phase involved in Compilation process.
CO2:	Implement the parsing techniques including Bottom-up and Top-down parsing for the given programming construct described in Context Free Grammar.
CO3:	To Constructing the different parsing table.
CO4:	To Generate the intermediate code and the implementation of symbol table
CO5:	To Apply the optimization techniques and generate the machine code.

Unit I **10 Hrs**

Introduction to Compilers: Compilers and translators – Why do we need translators – The structure of a compiler – Lexical Analysis – Syntax Analysis – Intermediate Code Generation – Optimization – Code Generation – Bookkeeping – Error Handling – Compiler Writing Tools.

Finite Automata and Lexical Analysis: The role of the lexical analyzer – A simple approach to the design of lexical analyzers – Regular Expressions – Finite automata.

Unit II **10 Hrs**

The Syntactic Specification of Programming Languages: Context free Grammars – Derivations and parse trees.

Basic Parsing Techniques: Parsers – Shift reduce parsing – Operator precedence parsing – Top down parsing – Predictive parsers.

Unit III **10 Hrs**

Automatic Construction of Efficient Parsers: LR parsers – The canonical collection of LR(0) items – Constructing SLR parsing tables – Constructing canonical LR parsing tables – Constructing LALR parsing tables – Using ambiguous grammars – An automatic parser generator – Implementation of LR parsing tables.

Unit IV **10 Hrs**

Syntax-Directed Translation: Syntax directed translation schemes – Implementation of Syntax directed translators – Intermediate code – Postfix notation – Parse trees and syntax trees – Three address code, quadruples and triples.

Symbol Tables: The contents of a symbol table – Data structures for symbol tables.

Unit V **8 Hrs**

Error Detection and Recovery: Errors – Lexical phase errors – Syntactic phase errors – Semantic errors.

Introduction to Code Optimization: The principal sources of optimization – Loop optimization – The DAG representation of basic blocks.

Code Generation: Object programs – Problems in code generation – A Machine Model – A simple Code generator – Peephole optimization.

Text Book:

Alfred V.Aho, Jeffrey D.Ullman, ***Principles of Compiler Design,*** Narosa Publishing House, 2002.

Unit I: Chapter 1, Chapter 3(3.1 to 3.4)
Unit II: Chapter 4(4.1& 4.2), Chapter 5
Unit III: Chapter 6 (6,1 to 6.8)
Unit IV: Chapter 7(7.1 to 7.6), Chapter 9(9.1,9.2)
Unit V: Chapter 11, Chapter 12(12.1 - 12.3), Chapter 15(15.1 - 15.4, 15.7)

Reference Book:

Alfred V.Aho, Monica S.Lam, Ravi Sethi, Jeffrey D.Ullman, ***Compilers Principles, Techniques and Tools***, Second edition, Pearson Publications, 2007.

Core 14 - Artificial Intelligence

Contact Hours per Week: 3 **Credits : 3**
Contact Hours per Semester: 36 **Subject Code : P20CAC33**

Course Outcome:

Students, after successful completion of the course, will be able to:

CO1:	Understand the basics of Artificial Intelligence
CO2:	Gain knowledge on Search Techniques.
CO3:	Understand how to encode knowledge.
CO4:	Learn problem solving by collecting evidence
CO5:	Learn advance concepts in Artificial Intelligence

Unit I **8 hrs**

What is Artificial Intelligence? : The AI problems – The underlying assumption – What is an AI technique? – The level of the model – Criteria for success.

Problems, Problem Spaces and Search: Defining the problem as a state space search – Production systems – Problem characteristics – Production system characteristics – Issues in the Design of search programs – Additional problems.

Unit II **6 hrs**

Heuristic Search Techniques: Generate-and-Test – Hill Climbing – Best-First Search – Problem Reduction – Constraint satisfaction – Means-Ends analysis.

Unit III **8 hrs**

Knowledge Representation Issues: Representations and Mappings – Approaches to knowledge representation – Issues in knowledge representation – The frame problem.

Using Predicate Logic: Representing simple facts in Logic – Representing instance and Isa relationships – Computable Functions and predicates – Resolution – Natural deduction

Unit IV **7 hrs**

Statistical Reasoning: Probability and Bayes theorem – Certainty factors and rule-based systems – Bayesian Networks – Dempster-Shafer theory – Fuzzy logic.

Unit V **7 hrs**

Game Playing: Overview – The Minmax search procedure – Adding Alpha-Beta cutoffs – Additional Refinements – Iterative deepening.

Expert Systems: Representing and using domain knowledge – Expert System Shells – Explanation – Knowledge Acquisition.

Text Book:

Elaine Rich and Kevin Knight, ***Artificial Intelligence,*** Tata McGraw Hill Publishing Company Limited, 21st reprint 2001.

Unit I : Chapter 1, Chapter 2
Unit II: Chapter 3
Unit III: Chapter 4, Chapter 5
Unit IV: Chapter 8
Unit V: Chapter 12 (12.1 – 12.5), 20 (20.1 – 20.4)

Reference Books:

1. Stuart Russell, Peter Norvig, ***Artificial Intelligence: A Modern Approach***, Pearson education, Third edition, 2014.
2. Richard E Neapolitan, ***Artificial Intelligence: With an Introduction to Machine Learning***, CRC Press, Second Edition, 2018.

Core 15 - Internet of Things

Contact Hours per Week: 4 **Credits : 4**
Contact Hours per Semester: 48 **Subject Code : P20CAC34**

Course Outcomes:
Students, after successful completion of the course, will be able to:

CO1:	Understand the concepts of Internet of Things.
CO2:	Determine the Market Perspective of IoT and Data Management in IoT.
CO3:	Design IoT applications in different domain and be able to analyze their performance
CO4:	Implement basic IoT applications on embedded platform.
CO5:	Application of IoT in Industrial and Commercial Building Automation and Real World Design Constraints

Unit I **10 Hrs**

Introduction to IoT: Introduction - Physical design of IoT - Logical design of IoT - IoT enabling Technologies - IoT Levels & Deployment templates.

Domain Specific IoTs: Introduction - Home Automation – Cities – Environment – Energy – Retail – Logistics - Agriculture – Industry – Health & Lifestyle.

Unit II **10 Hrs**

IoT & M2M: Introduction – M2M - Difference between IoT and M2M - SDN and NFV for IoT.

IoT System Management with NETCONF-YANG: Need for IoT Systems Management – SNMP – Network Operator Requirements – NETCONF – YANG - IoT System Management with NETCONF-YANG.

Unit III **8 Hrs**

IoT Platforms Design Methodology: Introduction - IoT Design Methodology - Case Study on IoT System for Weather Monitoring - Motivation for using Python.

Case studies illustrating IoT Design: Cities

Unit IV **10 Hrs**

IoT Systems – Logical Design using Python: Introduction - Installing Python - Python Data types & Data Structures - Control Flow – Functions – Modules – Packages - File Handling - Date/ Time Operations – Classes - Python Packages of Interest for IoT.

Unit V **10 Hrs**

IoT Physical Devices & Endpoints: What is an IoT Device - Exemplary Device: Raspberry Pi - About the Board - Linux on Raspberry Pi - Raspberry Pi Interfaces - Programming Raspberry Pi with Python – Other IoT Devices.

IoT Physical Servers & Cloud Offerings: Amazon Web Services for IoT.

Text Book:

Arshdeep Bahga, Vijay Madisetti,. ***Internet of Things : A Hands-On Approach*** Universities Press (India) Private Limited; First Edition, 2019.

Unit I: Chapter 1, 2
Unit II: Chapter 3, 4
Unit III: Chapter 5, 9 (9.3)
Unit IV: Chapter 6
Unit V: Chapter 7, 8 (8.6)

Reference Books:

1. Waltenegus Dargie,Christian Poellabauer. ***Fundamentals of Wireless Sensor Networks:Theory and Practice***, WILEY Publication; First Edition 2010.
2. Francis daCosta. ***Rethinking the Internet of Things: A Scalable Approach to Connecting Everything***, Apress Publications; First Edition,2013

Elective III - Software Project Management

Contact Hours per Week: 5 **Credits : 5**
Contact Hours per Semester: 60 **Subject Code : P20CAE31**

Course Outcomes:
Students, after successful completion of the course, will be able to:

CO1:	To Understand the practices and methods for successful software project management.
CO2:	To Identify techniques for requirements, policies and decision making for effective resource management
CO3:	To Apply the evaluation techniques for estimating cost, benefits, schedule and risk
CO4:	To Devise a framework for software project management plan for activities, risk, monitoring and control
CO5:	To Devise a framework to manage people.

Unit I **12 Hrs**

Introduction to Software Project Management: Introduction - Why is Software Project Management important - What is a Project? – Software Projects versus Other types of Project - Contract Management and Technical Project Management - Activities Covered by Software Project Management, Plans, Methods and Methodologies - Some ways of categorizing software projects – Stakeholders - Setting Objectives - Business Case - Project Success and Failure - What is Management? - Management Control - Traditional versus Modern Project Management Practices.

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 – Steps 9 and 10 : Execute plan/ lower levels of planning.

Unit II **15 Hrs**

Project evaluation and Programme management: Introduction – A Business Case – Project Portfolio Management - Evaluation of Individual Projects - Cost Benefit Evaluation Techniques - Risk Evaluation - Programme Management - Managing the allocation of resources within programmes – Benefits Management.

Activity planning: Introduction **-** 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 critical path - Activity Float - Shortening the Project Duration – Identifying Critical activities - Activity on Arrow Networks.

Unit III **12 Hrs**

Risk Management: Introduction - Risk - Categories of Risk - A framework for dealing with Risk - Risk Identification - Risk assessment - Risk planning - Risk management.
Monitoring and control: Introduction **-** Creating the Framework - Collecting the Data – Review - Project Termination Review - Visualizing Progress - Cost Monitoring - Earned Value Analysis - Prioritizing Monitoring - Getting Project Back To Target - Change Control - Software Configuration Management.

Unit IV **10 Hrs**

Managing Contracts: Introduction – Types of contract – Stages in contract placement – Typical terms of contract – Contract management – Acceptance.
Managing people in Software Environments: Introduction - Understanding Behaviour - Organizational Behaviour: A Background - 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.

Unit V **11 Hrs**

Working In Teams: Introduction - Becoming a Team - Decision Making – Organization and team structures – Leadership.
Software Quality: Introduction – The place of software quality in project planning – The importance of software quality – Defining software quality – Product versus process quality management – Quality management systems – Process capability models – Techniques to help enhance software quality - Testing

Text Book:

Bob Hughes, Mike Cotterell, Rajib Mall, ***Software Project Management*****,** Fifth Edition, Tata McGraw Hill Education, Sixth Reprint 2013.

Unit I: Chapter 1, 3
Unit II: Chapter 2 (2.1 – 2.8, 2.13), 6
Unit III: Chapter 7 (7.1 – 7.8), 9
Unit IV: Chapter 10, 11
Unit V: Chapter 12 (12.1 - 12.4, 12.9), 13 (13.1 – 13.4, 13.7 – 13.11)

Reference Books:

1. PankajJalote***, Software Project Management in Practise***, Pearson Education, 2002.
2. Robert T. Futrell, Donald F. Shafer, Linda I. Safer***, Quality Software Project Management***, Pearson Education, Asia, 2002.

Elective III - Theory of Computation

Contact Hours per week : 5 Hrs **Subject Code : P20CAE32**
Contact Hours per Semester: 60 Hrs **Credits: 5**

Course outcomes:
Students, after successful completion of the course, will be able to:

CO1:	To Design finite state automata and regular expression for a language specification and convert one form to another form
CO2:	To Learn to write Context Free Grammars and normalize.
CO3:	To Design push down automata (PDA) for languages and convert CFG to PDA and vice versa
CO4:	To Construct Turing machine by applying different techniques
CO5:	To Find undecidability in languages

Unit I **12 Hrs**

Finite Automata: Deterministic Finite Automata: Definition of a Deterministic Finite Automaton – How a DFA Processor Strings – Simpler Notations for DFA's – Extending the Transition Function to Strings – The Language of a DFA.

Nondeterministic Finite Automata: An Informal View of Nondeterministic Finite Automata –Definition of Nondeterministic Finite Automata – The Extended Transition Function – The Language of an NFA – Equivalence of Deterministic and Nondeterministic Finite Automata.

Finite Automata with Epsilon-Transitions: Uses of Epsilon-Transitions – The Formal Notation for an Epsilon-NFA – Epsilon-Closures – Extended Transitions and Languages for Epsilon-NFA's – Eliminating Epsilon-Transitions.

Regular Expressions: The Operators of Regular Expressions – Building Regular Expression – Precedence of Regular-Expression Operators.

Finite Automata and Regular Expressions: From DFA's to Regular Expressions – Converting DFA's to Regular Expressions by Eliminating States – Converting Regular Expressions to Automata.

Unit II **12 Hrs**

Proving Languages Not to Be Regular: The Pumping Lemma for Regular Languages – Applications of the Pumping Lemma.

Closure Properties of Regular Languages: Closure of Regular Languages Under Boolean Operations – Reversal – Homomorphisms – Inverse Homomorphisms.

Equivalence and Minimization of Automata: Testing Equivalence of States – Testing Equivalence of Regular Languages.

Context-Free Grammars: Definition of Context-Free Grammars – Derivation using a Grammar – Leftmost and Rightmost Derivations.

Parse Trees: Constructing Parse Trees – The Yield of a Parse Tree – Inference, Derivations, and Parse Trees.

Ambiguity in Grammars and Languages: Ambiguous Grammars – Removing Ambiguity from Grammars.

Unit III **12 Hrs**

Definition of the Pushdown Automaton: Informal Introduction – The Formal Definition of Pushdown Automata – A Graphical Notation for PDA's – Instantaneous Descriptions of a PDA.

Equivalence of PDA's and CFG's: From Grammars to Pushdown Automata – From PDA's to Grammars.

Deterministic Pushdown Automata: Definition of a Deterministic PDA – Regular Languages and Deterministic PDA's.

Normal Forms for Context-Free Grammars: Eliminating Useless Symbols – Eliminating Epsilon-Productions – Eliminating Unit Productions – Chomsky Normal Form.

The Pumping Lemma for Context-Free Languages: Statement of the Pumping Lemma – Applications of the Pumping Lemma for CFL's.

Unit IV **12 Hrs**

The Turing Machine: Notation for the Turing Machine – Instantaneous Descriptions for Turing Machines – Transition Diagrams for Turing Machines –The Language of a Turing Machine – Turing Machines and Halting.

Programming Techniques for Turing Machines: Storage in the State –Multiple Tracks - Subroutines.

Extensions to the Basic Turing Machine: Multitape Turing Machines – Equivalence of One-Tape and Multitape TM's – Nondeterministic Turing Machines.

Unit V **12 Hrs**

Undecidable Problems About Turing Machines: Reductions – Turing Machines That Accept the Empty Language – Rice's Theorem and Properties of the RE Languages.

Post's Correspondence Problem: Definition of Post's Correspondence Problem – The "Modified" PCP – Completion of the Proof of PCP Undecidability.

The Classes P and NP: Problems Solvable in Polynomial Time – Polynomial-Time Reductions – NP-Complete Problems.

Text Book:

John E.Hopcroft, Rajeev Motwani, Jeffery D.Ullman, ***Introduction to Automata Theory, Languages, and Computation,*** Pearson Education., 3rd Edition, 2009.

Unit I : Chapter 2: **2.2:** 2.2.1 – 2.2.5, **2.3:**2.3.1 – 2.3.5, **2.5:** 2.5.1 – 2.5.5
Chapter 3: **3.1:** 3.1.1 – 3.1.3, **3.2:** 3.2.1 – 3.2.3

Unit II : Chapter 4: **4.1:**4.1.1 – 4.1.2, **4.2:**4.2.1 – 4.2.4, **4.4:**4.4.1 – 4.4.2
Chapter 5: **5.1:** 5.1.2 – 5.1.4,**5.2:** 5.2.1 – 5.2.3, **5.4:** 5.4.1 – 5.4.2

Unit III : Chapter 6: **6.1:** 6.1.1 – 6.1.4, **6.3:**6.3.1 – 6.3.2, **6.4:** 6.4.1 – 6.4.2

Chapter 7: **7.1:** 7.1.1, 7.1.3 – 7.1.5, **7.2:** 7.2.2, 7.2.3
Unit IV: Chapter 8: **8.2:**8.2.2– 8.2.6**, 8.3:** 8.3.1 – 8.3.3, **8.4:**8.4.1,8.4.2, 8.4.4.
Unit V : Chapter 9: **9.3:**9.3.1 – 9.3.3, **9.4:**9.4.1 – 9.4.3
Chapter 10: **10.1:** 10.1.1,10.1.5,10.1.6

Reference Book:

Harry R.Lewis,Christos H.Papadimitriou, ***Elements Of The Theory Of Computation***, Dorling kindersley (India) Pvt. Ltd., 2nd Edition, 2008.

Elective III - Soft Computing

Contact Hours per week : 5 Hrs **Subject Code : P20CAE33**
Contact Hours per Semester: 60 Hrs **Credits : 5**

Course Outcome:

Students, after successful completion of the course, will be able to:

CO1:	Learn the basic concepts of Soft Computing and gain knowledge of Artificial Neural Network.
CO2:	Learn associative memory and unsupervised learning
CO3:	Learn fuzzy sets and its representations
CO4:	Learn Classical Logic, Fuzzy Logic and decision making
CO5:	Learn Genetic algorithms and pattern recognition.

Unit I **12 Hrs**

Introduction: Introduction to Soft Computing **–** Evolutionary Computing – Hard Computing Vs Soft Computing – Soft Computing Methods - Recent Trends in Soft Computing. **Fundamentals of Artificial Neural Network:** Introduction – Model of Biological Neuron – Mathematical Model of Neuron- ANN Architecture- Learning Rules – Learning Paradigms – Perceptron Network -Adaline and Madaline Networks - Applications of Neural Network.

Unit II **12 Hrs**

Associative Memory: Introduction – Autoassociative Memory – Hetero-associative Memory – Bidirectional Associative Network - Applications of Associative Memory.

Unsupervised Learning: Introduction – Winner-Takes-All Network – Learning Vector Quantization – Self-organization Map - Adaptive Resonance Theory – Neocognitron – Applications of Unsupervised Learning.

Unit III **12 Hrs**

Associate Models: Hopfield Network – Boltzmann Network – Simulated Annealing – Application of Networks.

Classical Sets and Fuzzy Sets: Crisp Sets – Fuzzy Sets: History and Origin – Fuzzy Sets: Basic Concepts – Paradigm Shift – Representation of Fuzzy Sets.

Unit IV **12 Hrs**

Classical Logic and Fuzzy Logic: Logic – Interval Analysis – Fuzzy Numbers – Fuzzy Logic.

Fuzzy Decision Making: Introduction – Individual Fuzzy Decision Making – Multiperson Decision Making - Multicriteria Decision Making – Multistage Decision Making.

Unit V **12 Hrs**

Genetic Algorithms: History of Evolutionary Computing – Crossover and Mutation Properties -Genetic Algorithm Cycle – Fitness Function – Applications of Genetic Algorithm.

Application of Soft Computing Techniques: Pattern Recognition – Image Processing – Application of Soft Computing in Real Estate.

Text Book:

B.K. Tripathy, J. Anuradha , ***Soft Computing Advances and Applications*****,** 2015.

Unit I: Chapter 1,2
Unit II: Chapter 4, Chapter 5
Unit III: Chapter 6, Chapter 7 (7.1 – 7.5)
Unit IV: Chapter 9, Chapter 11
Unit V : Chapter 13, Chapter 17 (17.1 – 17.3)

Reference Book:

Dilip K. Pratihar, ***Soft Computing Fundamentals and Applications***, 2015.

Core 16 LAB - Android Programming

Contact Hours per Week: 5 **Credits : 3**
Contact Hours per Semester: 60 **Subject Code : P20CAP31**

Course outcomes:

Students, after successful completion of the course, will be able to:

CO1:	Develop an Android application
CO2:	Understand the tools used to develop a Android Application
CO3:	Develop an Android application using various tools

List of Programmes:

1. Develop a sample Android application.
2. Develop an Android application using Activities.
3. Develop an Android application using Intents. (Explicit)
4. Develop an Android application using Built-in Intents.
5. Develop an Android application using Fragments.
6. Develop an Android application using Action Bar.

7. Develop an Android application for registration form using Basic Views.
8. Develop an Android application using Picker Views.
9. Develop an Android application using List Views.
10. Develop an Android application using Spinner Views.
11. Develop an Android application for Gallery using Image Views.
12. Develop an Android application using Menus.(Option Menu and Context Menu)
13. Develop an Android application to save and retrieve user data using Preferences.
14. Develop an Android application using Databases.
15. Develop an Android application using Content Providers.
16. Develop an Android application using 'Messaging' and 'E-Mail'.
17. Develop an Android application using Maps.

Core 17 LAB: Dot Net Programming

Contact Hours Per Week : 5 Hrs. **Subject Code: P20CAP32**
Contact Hours Per Semester : 60 Hrs **Credits: 3**

Course outcomes:
Students, after successful completion of the course, will be able to:

CO1:	Work with various tools in the .Net Environment
CO2:	Develop Console and Windows applications using VB.Net
CO3:	Develop Console and Windows applications using C#.Net
CO4:	Develop web applications using ASP.Net

List of Programmes:
1. Write a program in VB.Net console application to perform Arraylist operations.
2. Write a program in VB.Net console application to demonstrate Constructor Overloading.
3. Write a program in VB.Net windows application to design a Scientific Calculator.
4. Develop Departmental Store application in VB.Net windows application.
5. Write a program in VB.Net to perform Number checking (like Armstrong, Adam, Palindrome, Perfect)
6. Write a C#.net console application to implement Multilevel Inheritance
7. Write a C#.net windows application to implement Regular Expression.
8. Develop a simple animation using C#.net windows application
9. Develop C#.net windows application for library management system
10. Write an ASP .Net program to find the factorial of a given number by using function
11. Write an ASP .Net program to generate a fibonacci series by using subroutine
13. Write an ASP .Net program for form validation by using all validation controls
14. Create an Asp.Net web application for employee payroll processing.

Core 18 - R Programming

Contact Hours per week : 4 Hrs **Subject Code : P20CAC41**

Contact Hours per Semester : 48 Hrs **Credits : 4**

Course Outcomes:

Students, after successful completion of the course, will be able to:

CO1:	To understand the basic concepts of R and gain knowledge on R programming.
CO2:	To gain knowledge on data storage in R Programming and to import and export other File formats to R Programming
CO3:	To gain knowledge on mathematical operations in R Programming.
CO4:	To understanding the graphical operations in R Programming.
CO5:	To gain knowledge on Customization of Plots.

Unit I **9 Hrs**

A short introduction to R: Introduction - Installing R - Getting started - Some information on R commands - Special values – Objects – Functions - Simple manipulations-Numbers and Vectors - Matrices and Arrays – Factors - Lists - Data Frames.

Programming using R: Introduction - Function creation – Scripts - Logical Operators - Conditional Statements - Loops in R - switch Statement.

Unit II **10 Hrs**

Lists and data frames: Introduction - Creating a List - Common List Operations - Recursive List - Creating a Data Frame - Common Data Frame Operations - Using lapply() and sapply() functions.

Import and Export: Introduction - Saving and Loading R data - Import and Export to CSV files - Import data from SAS - Import and Export via ODBC.

Unit III **10 Hrs**

Mathematical and Statistical Concepts: Introduction – Maximum and Minimum – Frequency Distribution – Frequency Distribution types - Measure of Central Tendency – Measure of Dispersion – Correlation.

Unit IV **9 Hrs**

Graphics: Introduction - Basic plots - Labeling and Documenting plots - Adjusting the Axes - Specifying Colors - Specifying Fonts - Specifying Sizes - Plotting Symbols.

Unit V **10 Hrs**

Customised Plotting: Introduction – Change of Plotting line style – Adding Items on a Plot - Higher Dimensional Data Display – Changing the Plot settings using par() function.

Text Book:

Sandip Rakshit. ***R For Beginners.*** McGraw Hill Education (India) Private Limited; First Edition, 2017.

Unit I: Chapter 1, 2
Unit II: Chapter 3, 6
Unit III: Chapter 7
Unit IV: Chapter 12
Unit V: Chapter 13

Reference Books:

1. Garrett Grolemund. ***Hands on Programming with R***, O'Reilly Media Inc.
2. Andrie de Vries. ***R for Dummies*****,** John Wiley & Sons Inc, Second Edition, 2015
3. Kun Ren. ***Learning R Programming*****,** Packt Publishing Ltd, First Edition, 2016

Core 19 – Lab : Angular JS

Contact Hours per week : 4 Hrs **Subject Code : P20CAP41**
Contact Hours per Semester : 48 Hrs **Credits : 2**

Course outcomes:

Students, after successful completion of the course, will be able to:

CO1:	Create a basic sample application in AngularJS.
CO2:	Develop an application using concepts such as models and controllers in AngularJS.
CO3:	Develop an application using built-in and custom directives.
CO4:	Develop a web application using Routing in AngularJS.
CO5:	Develop single page applications using AJAX with AngularJS.

List of Programmes:

1. Create a simple application using AngularJS.
2. Use of Directives in AngularJS.
3. Use of Expressions in AngularJS.
4. Creating Controllers in AngularJS.
5. Implementation of Filters in AngularJS.
6. Creating Tables in AngularJS.
7. Creating an AngularJS application with HTML DOM.
8. Creating Modules in AngularJS.
9. Creating AngularJS application using Forms.
10. Creating AngularJS application using Includes.
11. Creating AngularJS application using Scope.
12. Creating AngularJS application using Services.
13. Creating AngularJS application with AJAX.
14. Creating AngularJS Single Page Application using Views.

Project and Viva-Voce
(Industry/Institutional Based)

Credits : 6 **Subject Code : P20CA4PV**

Course Outcome:

CO1:	Students will have hands of experience of real life system development life cycle
CO2:	The students will learn to apply the technologies learnt during the course in real life projects
CO3:	Students will learn to work in real life project development environments involving deadlines and teamwork
CO4:	Students will learn to pick up and apply upcoming technologies in project development not covered during the course

Objectives:

- To solve real life problems in the In dustry/Academic Institutions/Computer science research.
- The Project and Viva-voce is one that involves practical work for understanding and solving problems in the field of computing.
- Students will do individually Commercial or Technical Project based on their Industry /Academic Institutions needs.
- With the known/needed technologies they can develop the software.

Course Name: P.G.D.C.A

Rules and Regulations, Course Scheme and Scheme of Examinations
(For those who join From June 2021 Onwards)

1) Course Objectives :

The objective of this programme is to develop system programmers and analysts to meet the manpower requirement of fast developing software industry. The programme is designed to enrich the programming and analysis ability of students. Professional computer knowledge is offered through PGDCA.

2) Eligibility for admission :

The applicants for PGDCA must have completed their graduation.

3) Duration of the Course :

1 Year – Two Semesters

4) Course Scheme :

Semester	Part	Subject	Hour	Credit	Int+Ext = Total	Subject Code
I	Core 1	Fundamentals of Computer	40	5	40+60=100	G3CA11
	Core 2	Programming in C	40	5	40+60=100	G3CA12
	Core 3 Lab	LAB: C Programming	40	5	40+60=100	G3CA1P1
	Core 4 Lab	LAB: GUI Programming	30	5	40+60=100	G3CA1P2
	Core 5 Lab	LAB: Office Automation	30	5	40+60=100	G3CA1P3

Semester	Part	Subject	Hour	Credit	Int+Ext = Total	Subject Code
II	Core 6	Web Programming	40	5	40+60=100	G3CA21
	Core 7	Relational Database Management System	40	5	40+60=100	G3CA22
	Core 8 Lab	LAB: Web Programming	30	5	40+60=100	G3CA2P1
	Core 9 Lab	LAB: RDBMS	40	5	40+60=100	G3CA2P2
	Core 10 Lab	LAB: Multimedia	30	5	40+60=100	G3CA2P3

Core 1- Fundamentals of Computer

Contact Hours per week : 2 Hrs **Credits :5**
Contact Hours per Semester: 40 Hrs **Subject Code:** G3CA11

Course Outcomes:

Students, after successful completion of the course, will be able to:

CO1:	Be familiar with Generations and History of Computers.
CO2:	Get knowledge on memory devices.
CO3:	Know the devices used for input and output.
CO4:	To know the networking concepts.
CO5:	Get familiar with Internet and WWW.

Unit I **8 hrs**

Understanding the Computer: Introduction – Evolution of Computers – Generations of Computers – Classification of Computers – Computing Concepts – The Computer System – Applications of Computers.
Computer Organisation and Architecture: Introduction – Central Processing Unit.

Unit II **8 hrs**

Memory and Storage Systems: Introduction – Memory Representation – Random Access Memory – Read only Memory – Storage Systems.
Input Devices: Introduction– Keyboard – Pointing Devices – Scanning Devices – Optical Recognition Devices – Media Input Devices.

Unit III **8 hrs**

Output Devices: Introduction – Display Monitors – Impact Printers – Non-Impact Printers – Projectors.
Computer Codes: Introduction – Decimal System – Binary System – Hexadecimal System – Octal System – Conversion of Numbers (Decimal to Binary and Binary to Decimal).

Unit IV **8 hrs**

Computer Software: Introduction – Types of Computer Software.
Data Communications and Networks: Introduction – Data Communication using Modem – Computer Network – Network Topologies.

Unit V **8 hrs**

The Internet and World Wide Web: Introduction – History of Internet – Internet Applications – Understanding the World Wide Web – Web Browsers – Browsing the Internet – Using a Search Engine.

Text Book:

E.Balagurusamy, ***Fundamentals of Computer***, Tata McGrawHill Education, 17th Reprint 2016.

Unit I : Chapter 1, Chapter 2(2.1, 2.2)
Unit II : Chapter 3 (3.1 to 3.5)**,** Chapter 4 (4.1 to 4.5, 4.9)
Unit III: Chapter 5 (5.1, 5.2, 5.4, 5.5, 5.8), Chapter 6 (6.1 to 6.5, 6.9)
Unit IV: Chapter 10 (10.1, 10.2), Chapter 14 (14.1 to 14.4)
Unit V : Chapter 15 (15.1 to 15.7)

Reference Books:

1. Anitha Goel, ***Fundamentals of Computers*** , Dorling Kindersley (India) Pvt Ltd., 2010.
2. V.Rajaraman ***Fundamentals of Computers*** , Neeharika Adabala, Sixth Edition, PHI Pvt Ltd, 2015

Core 2 - Programming in C

Contact Hours per Week: 2 hrs **Credits :5**
Contact Hours per Semester:40 hrs **Subject Code:** G3CA12

Course Outcome:

Students, after successful completion of the course, will be able to:

CO1:	To know about the basic programming concepts
CO2:	Analyze the input and output operations
CO3:	Elucidate the usage of array and strings
CO4:	Illustrate the use of decision making and branching
CO5:	Understand how to design user-defined functions

Unit I **10 Hrs**

Overview of C: History of C – Importance of C - Basic structure of C programs. **Constants, Variables and Data Types:** Character set – C Tokens – Keywords and Identifiers – Constants – Variables – Data types- Declaration of variables – Defining symbolic constants. **Operators and Expressions:** Arithmetic operators – Relational operators – Logical operators – Assignment operators – Increment and Decrement operators – Conditional operator – Bitwise operators – Special operators.

Unit II **6 Hrs**

Operators and Expressions: Arithmetic Expressions – Evaluation of Expressions – Precedence of Arithmetic operators.
Managing Input and Output Operations: Reading a character – Writing a character – Formatted input - Formatted output.

Unit III **8 Hrs**

Decision Making and Branching: Decision making with if statement – Simple If statement – The If..Else statement – Nesting of If….Else statement – The Else If ladder - The switch statement – The ? : Operator – The goto statement.
Decision Making and Looping: The while statement – The do statement – The for statement.

Unit IV **10 Hrs**

Array: One-dimensional arrays – Declaration of One-dimensional arrays – Initialization of One-dimensional arrays – Two-dimensional arrays – Initializing two-dimensional arrays.
Character Arrays and Strings: Declaring and initializing string variables – Reading string from terminal – Writing strings to screen – Arithmetic operations on characters – Putting strings together – Comparison of two strings – String handling functions.

Unit V **6 Hrs**

User- Defined Functions: Need for user-defined functions – A multi-functions program – Elements of user-defined functions – Definition of functions – Return values and their types – Function calls – Function declaration – Category of function – No arguments and no return values - Arguments but no return values - Arguments with returns values - No arguments but returns a values – Nesting of functions – Recursion.

Text Book:

E. Balagurusamy, ***Programming in ANSI C***, 7th Edition, McGraw Hill Education (India) Pvt. Ltd., New Delhi, 2017.

Unit I : Chapter 1 (Page No. 1-3, 12), Chapter 2 (22- 36, 42-44), Chapter 3 (52-61)
Unit II : Chapter 3 (Page No. 61-64), Chapter 4 (82- 101)
Unit III: Chapter 5 (Page No. 112-135), Chapter 6 (151- 165)
Unit IV: Chapter 7 (Page No. 191-212), Chapter 8 (235 – 255)
Unit V : Chapter 9 (Page No. 268 – 289, 290 - 292)

Reference Book:

Ashok N. Kamthane, ***Programming with ANSI and Turbo C***, Seventh Impression, Pearson Education, 2009.

Core 3 Lab: C Programming

Contact Hours per Week: 2 hrs **Credits :5**
Contact Hours per Semester: 40 hrs **Subject Code:** G3CA1P1

Course Outcome:

Students, after successful completion of the course, will be able to:

CO1:	Develop the logic for the given problem.
CO2:	Recognize and understand the syntax and construction of C code.
CO3:	Know the steps involved in compiling, linking and debugging C code.
CO4:	Declare and define the user defined functions.

List of Programmes:

1. Program to implement simple if.
2. Program to implement if else.
3. Program to implement else if ladder
4. Program to implement switch case.
5. Program to implement while loop.
6. Program to implement do while loop.
7. Program to implement for loop.
8. Program to implement nested for loop.
9. Program to arrange names in alphabetical order.
10. Program to implement functions.
11. Program to implement Recursive functions.
12. Program to illustrate the use of built-in string functions.
13. Program to display the Length of given string.
14. Program for Comparison of two given string.

Core 4 - Lab: GUI Programming

Contact Hours per week : 2 Hrs **Credits :5**
Contact Hours per Semester: 30 Hrs **Subject Code:** G3CA1P2

Course Outcomes:

Students, after successful completion of the course, will be able to:

CO1:	Understand the basic concepts of Windows application development using VB.Net
CO2:	Gain knowledge on the basic tools in VB.Net
CO3:	Create application using VB.Net

CO4:	Gain knowledge on client server programming in VB.Net.
CO5:	Gain knowledge on ASP .Net

List of Programmes:

1. Write a VB.Net program to design a Digital Clock.
2. Write a VB.Net program to calculate Simple Interest and Compound Interest.
3. Write a VB.Net program to find sum of digits.
4. Write a VB.Net program check the given number is Armstrong or not.
5. Write a VB.Net program to design a simple calculator.
6. Write a VB.Net program to perform List box operations.
7. Write a VB.Net Program to perform Quiz.
8. Write a VB.Net program to display Font Dialog box.
9. Write a VB.Net program to illustrate the usage of Menu Strip.
10. Write a VB.Net program for String Operations.
11. Write a VB.Net program to design an Application Form.
12. Write a VB.Net program to illustrate the use of Data Set and Data Grid View.
13. Write an ASP .Net program to illustrate the use of Validation Controls.
14. Write an ASP .Net program to display Multiplication table.

Core 5 Lab: Office Automation

Contact Hours per Week: 2 hrs **Credits :5**
Contact Hours per Semester: 30 hrs **Subject Code:** G3CA1P3

Course Outcome:
Students, after successful completion of the course, will be able to:

CO1:	Familiarize the preparation of documents and presentations with Office automation tools.
CO2:	Perform accounting operations
CO3:	Perform presentation skills

List of Programmes:

1. Working with Explore [Files/Folders: Create, Copy, Paste, Delete, Rename]
2. Create and Edit document
3. Create a document with different alignments
4. Table Manipulation
5. Mail Merge
6. Creation of Worksheet and Editing
7. Manipulating Excel Functions
8. Create and Process Employee pay details
9. Create different types of Chat

10. Create and Edit Database Table
11. Manipulating query commands from the Database Table
12. Report Generation
13. Slide Layout Generation
14. Slide Animation
15. Slide Transition Effects

Semester - II

Core 6 - Web Programming

Contact Hours per Week: 2 hrs **Credits :5**
Contact Hours per Semester: 40 hrs **Subject Code:** G3CA21

Course Outcome:

Students, after successful completion of the course, will be able to:

CO1:	Know about web browser
CO2:	Understand basic tags in HTML
CO3:	Illustrate the use of hyperlinks
CO4:	Elucidate the purpose of navigation in web page
CO5:	Explain formatting of tables and form design in HTML

Unit I **8 Hrs**

Editing and Viewing HTML: Opening a Web Page in Notepad - Previewing a Web Page in a Web Browser - Making, Saving, and Viewing Changes.
Setting Up the Document Structure: Specifying the Document Type - Creating the HTML, Head, and Body Sections - Creating Paragraphs and Line Breaks - Specifying a Page Title and Metatags - Publishing a File to a Server.

Unit II **8 Hrs**

Formatting Text by Using Tags: Creating Headings - Applying Bold and Italic Formatting - Applying Superscript and Subscript Formatting - Using Monospace and Preformatted Text - Formatting a Block Quotation.
Using Lists and Backgrounds: Creating Bulleted and Numbered Lists - Creating Definition Lists - Inserting Special Characters - Inserting Horizontal Lines - Choosing Background and Foreground Colors - Specifying a Background Image File.

Unit III **8 Hrs**

Creating Hyperlinks and Anchors: Hyperlinking to a Web Page - Using Partial Paths and Filenames - Using Relative and Absolute Paths - Setting a Target Window - Hyperlinking to an E-Mail Address - Creating and Hyperlinking to Anchors - Hyperlinking to Other Content.

Displaying Graphics: Selecting a Graphics Format - Preparing Graphics for Web Use - Inserting Graphics - Arranging Elements on the Page - Controlling Image Size and Padding - Hyperlinking from Graphics - Using Thumbnail Graphics - Including Alternate Text for Graphics - Adding Figure Captions.

Unit IV **8 Hrs**

Creating Navigational Aids: Planning Your Site's Organization - Creating a Text-Based Navigation Bar - Creating a Graphical Navigation Bar - Creating an Image Map - Redirecting to Another URL.

Creating Tables: Creating a Simple Table - Specifying the Size of a Table - Specifying the Width of a Column - Merging Table Cells - Using Tables for Page Layout.

Unit V **8 Hrs**

Formatting Tables: Applying Table Borders - Applying Background and Foreground Fills - Changing Cell Padding, Spacing, and Alignment.

Creating User Forms: Create a basic form - Create check boxes and option buttons - Create lists.

Text Book:

Faithe Wempen, ***HTML5 Step by Step***, Microsoft Corporation, 2011.

Unit I : Chapter 1, 2
Unit II : Chapter 3(Page No. 25 – 40), 4
Unit III: Chapter 5, 9
Unit IV: Chapter 10,12
Unit V : Chapter 13, 14 (Page No 251 – 266)

Reference Book:

St. Xavier, ***World Wide Web***, McGraw Hill Education (India) Pvt. Ltd., New Delhi, 2000

Core 7 - Relational Database Management System

Contact Hours per week : 2 Hrs **Credits :5**
Contact Hours per Semester: 40 Hrs **Subject Code:** G3CA22

Course Outcomes:

Students, after successful completion of the course, will be able to:

CO1:	Be familiar with the basic concepts of database.
CO2:	Get knowledge on DML and DDL statements.
CO3:	Know the execution of query statements.

CO4:	To know about the usage of Constraints
CO5:	Get familiar with normal forms.

Unit I **9 hrs**

Introduction to DBMS: Database - Management System - Database Management System - DBMS Acts Like an Interface-Application of DBMS-Advantages of DBMS-Disadvantages of DBMS-DBMS Versus File System-Difference between File Management System and DBMS-Classification of DBMS Users-Data Abstraction-Application Architecture of DBMS-Data Models-Schemas and Instances-Mappings-Data Independence - Database Languages.

Unit II **8 hrs**

Data Modeling Using The Entity Relationship Model: E-R Model Concepts -Notation of E-R Diagram – Attributes – Entity - Mapping Constraints/Mapping Cardinality - Keys - Examples of E-R Diagram.
Relational Data Model: Relational Database Schema – Codd's Rule for RDBMS-Integrity Constraints - Domain Constraints.

Unit III **8 hrs**

Interactive SQL Part-I: Table Fundamentals-Viewing Data in the tables-Eliminating Duplicate Rows When Using a Select Statement-Sorting Data in a Table-Delete Operations-Updating the Contents of the Table-Modifying the Structure of the Table-Renaming Tables-Truncating Tables-Destroying Tables.

Unit IV **8 hrs**

Interactive SQL Part-II: Types of Data Constraints – The Primary Key constraint – The Foreign Key Constraint (Foreign Key Constraint defined at Table Level) – The Unique Key Constraint (Unique Key Constraint defined at Column Level) – NOT NULL constraint define at Column Level – The CHECK Constraint (Check Constraint defined at Column Level).

Unit V **7 hrs**

Interactive SQL Part-III: Computations Done on Table Data-Oracle Functions-Date Conversion Functions-Date Functions.
Database Design and Normalization: Introduction-First Normal Form (1NF)-Second Normal Form (2NF)-Third Normal Form (3NF).

Text Books:

1. Rakesh Saini, M.M.S.Rauthan, Abhay Saxena. Bindu Sharma, ***Database Management System*** , Vayu Education of India publishing, First Edition 2010.

Unit I - Chapter 1 (1.1 to 1.17)
Unit II - Chapter 2 (2.1 to 2.7) Chapter 3 (3.8 to 3.11)
Unit V - Chapter 9 (9.1 to 9.2, 9.7, 9.8)

2. Ivan Bayross, ***SQL, PL/SQL The Programming Language of Oracle***, BPB Publications, Fourth Revised Edition Reprinted 2014.

Unit III - Chapter 7(Page No 114 to124, 126 to 131)
Unit IV - Chapter 8(Page No 139, 143, 147, 151, 152)
Unit V - Chapter 9(Page No 161 to 184)

Reference Books:

1. Peter Rob, Carlos Coronel, ***Database System concepts***, Publishing by Cengage Learning, First Edition 2008.
2. Nilesh Shah, ***Database Systems using Oracle***, Published by PHI Learning, Second Edition 2010.

Core 8 Lab: Web Programming

Contact Hours per Week: 2 hrs **Credits :5**
Contact Hours per Semester: 30 hrs **Subject Code:** G3CA2P1

Course Outcomes:

Students, after successful completion of the course, will be able to:

CO1:	Gain knowledge on the tags in HTML
CO2:	Design Forms using HTML tags
CO3:	Design web pages using HTML tags.

List of Programmes:

1. Create a Webpage using basic tags.
2. Create a Webpage using formatting tags.
3. Create a Webpage to demonstrate List tags.
4. Create a Webpage to demonstrate the use of Images.
5. Create a Webpage to demonstrate Linking
6. Create a Webpage to demonstrate the use of Table tags.
7. Create a Webpage to demonstrate the use of Frame and Frameset tags.
8. Create a Webpage to demonstrate Text, Password and Button Elements in forms.
9. Create a Webpage to demonstrate Checkbox, Radio and Textarea Elements in forms.
10. Create a Webpage to demonstrate Select and Option element in forms.

Core 9 Lab: RDBMS

Contact Hours per Week: 2 hrs **Credits :5**
Contact Hours per Semester: 40 hrs **Subject Code:** G3CA2P2

Course Outcomes:

Students, after successful completion of the course, will be able to:

CO1:	Learn how to create tables and perform operations on the table.
CO2:	Understand and execute different SQL queries.
CO3:	To understand the working of SQL Built-in functions,

List of Programmes:

1. DDL Commands.
2. DML Commands.
3. Using Constraints.
4. SQL Queries.
5. Aggregate Functions.
6. Numeric Functions
7. String Functions.
8. Date Functions.

Core 10 Lab: Multimedia

Contact Hours per Week: 2 hrs **Credits :5**
Contact Hours per Semester: 30 hrs **Subject Code:** G3CA2P3

Course Outcome:
Students, after successful completion of the course, will be able to:

CO1:	Increase the ability to edit and add special features to the images.
CO2:	Increase the ability to create flash movie.
CO3:	Design various applications such as cards, invitations, certificates etc.
CO4:	Use various tools and Filters effectively.

List of Programmes:

1. Merge different images into a single file using Feather effect.
2. Change the color of an image.
3. Implement Rain effect.
4. Implement Rainbow effect.
5. Create a water drop effect.

6. Implement Blinking effect.
7. Place an image into text.
8. Implement Page Curl effect.
9. Implement Ripple effect.
10. Flaming Hot Fire Text effect.
11. Picture Animation.
12. Image Masking.
13. Text Masking.
14. Create Motion Guide Layer.
15. Shape Tweening.
16. Globe Animation.
17. Bouncing a ball bouncing through the steps.
18. Procedure to implement moving ball using mouse drag (Action Script).
19. Procedure to display a ball using random method. (Action Script).
20. Procedure to implement moving ball using mouse roll over (Action Script).

Course Name: **Bachelor of Vocational**
Discipline: **Food Safety & Quality Management**
(FOR THOSE WHO JOIN IN 2019 AND AFTER)
Duration of the Course: **Three Years**

COURSE SCHEME:

Semester	Part	Subject	Hour	Credit	Int+Ext= Total	Subject Code	Focus on Employability/ Entrepreneurship/ Skill Development	Revised/ New/ No Change/ Interchanged If Revised % of Change
V	Core- 9	Food Safety and Quality Management Systems	6	7	25+75=100	B19FSC51	Skill Development	New
	Core 10	Food Toxicology	6	6	25+75=100	B19FSC52	Skill Development	New
	Core 11	International Food Legislations & Standards	6	5	25+75=100	B19FSC53	Skill Development	New
	Core 12 Lab	LAB: Food safety and quality management Systems	5	3	40+60=100	B19FSP51	Focus on Employability	New
	Core 13 Training	Apprenticeship at any food industry for Food Safety And Quality Management systems	5	3	100 (Internal)	B19FSC54	Entrepreneurship	New
	Core 14	Food Preservation Fruits and Vegetables	2	4	25+75=100	B19FSC55	Skill Development	New
		Industrial Visit & Report (Minimum 2 trips)	0	2	100 (Internal)	B19FSIV5	Focus on Employability	New
VI	Core 15	Medicinal Plants compounds Separation and Quality control	6	7	25+75=100	B19FSC61	Skill Development	New
	Core 16	Hygienic designs of food process equipment.	6	6	25+75=100	B19FSC62	Skill Development	New
	Core 17	Food Analysis and Adulteration Testing (FAAT)	5	5	25+75=100	B19FSC63	Skill Development	New
	Core 18 Lab	LAB :Food Adulteration Testing	5	3	40+60=100	B19FSP61	Focus on Employability	New
	Core19 Training	Apprenticeship at any food industry for Food Analysis And Adulteration testing.	5	3	100 (Internal)	B19FSC64	Entrepreneurship	New
	Core 20	Processed food packaging in milk products	3	4	25+75=100	B19FSC65	Skill Development	New

		Industrials Visit Report	0	2	100 (Internal)	B19FSIV6	Focus on Employability	New
		Total	**30**	**60**	**650**			

Semester – V

Core 9 – FOOD SAFETY AND QUALITY MANGEMENT SYSTEMS

Contact Hours per week: 6 **Subject Code:** B19FSC51
Contact Hours per semester: **75** (45Theory + 30Skill)
Credits: 7 (4 Theory + 3 Skill)

Course Outcome
Students will be able to understand

CO 1: Know the principles involving food management systems and food standardization.

CO 2: Explain the principles and current practices International Standard Organizations.

CO 3: Describe the basic principles and practices followed in food testing laboratories

CO 4: Identify the requirements of International and national food standardization.

Section- A: Theory

Unit I **(15 Hrs)**

International Standardization Organization (ISO), Joint FAO/WHO Food Standards Program. Codex Alimentarius Commission (CAC), Other International Organizations Active in Food Standard Harmonization. Advantages of Utilizing International Standards. Rapid Alert system.

Unit II **(12 Hrs)**

European Committee for Standardization (CEN), PAN American Standards Commission (COPANT), Euro-Asian Council for Standardization, FDA, EPA, EU, ASEAN, EFSA (European Food Safety Authority)

Unit III **(16 Hrs)**

Trends in Food Standardization, An Overview and structure of 9001:2000/2008, Clause wise Interpretation of ISO 9001:2000, Case Studies, An overview and Structure of 22000:2005, Clause wise Interpretation of ISO 22000:2005, Case Studies.

Unit IV **(16 Hrs)**

An Overview and Requirement of ISO 17025-Requirements Specific to Food Testing Laboratories- Need and Importance of food testing lab- Physical and Chemical Parameters-Requirement Specific to Food Testing Laboratories-Biological Parameters- General Topics : Related to Food Testing Laboratories.

Unit V **(16 Hrs)**

Introduction to HACCP and its management- BRC Food and BRC IOP Standards: An Overview – International Food Standard (IFS)- SQF: 1000 SQF: 2000- Global Gap and India Gap.

Text Books:

1. Sree lakshmi, Food science, new age international Publishers, Chennai.
2. Silley, P and S. Forsythe, (1996). Impedance Microbiology- a rapid change for microbiologists- A review. Journal of Applied Bacteriology, 80: 223- 243
3. Dziezak, J. D. 1987. Rapid methods for analysis of foods. Food Technol. 41(7): 56-73.
4. Johnson Green, Perry (2002). Diagnostic systems. In Introduction to Food Biotechnology, CRC Press, Florida.

Reference books:

1. Peppler, H. J., 1979, Microbial technology, Volumes I and II- Academic press, New York
2. Inteaz Alli. 2004. Food quality assurance - Principles & practices. CRC Press. New York.
3. Sara Mortimore and Carol Wallace. 2013. HACCP - A practical approach. Third edition. Chapman and Hall, London.
4. Roday, S. 1998. Food Hygiene and Sanitation, Tata McGraw-Hill Education.

Section –B Skill component

Contact Hours per semester: **30** **Credits: 3**

1. To ensure the quality and standards of food management systems.
2. To study the food quality standardization of ISO 9001-2000 series.
3. To study the food quality standardization of ISO 22000-2005 series.
4. To study the physical and chemical parameters followed in food testing laboratory.
5. To collect the sample and ensure the quality by international standardization techniques

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Core 10 - FOOD TOXICOLOGY

Contact hours per week: 6 **Credits:** 6 (3 Theory + 3 Skill)

Contact Hours per semester: **75** (45 Theory + 30 Skill) **Subject Code:** B19FSC52

Course Outcome

Students after successful completion of course will be able to

CO 1: Identify the important pathogens which causing toxicity in food and the conditions under which they will grow.

CO 2: Identify the conditions under which the important pathogens are commonly inactivated, killed or made harmless in foods.

CO 3: Utilize laboratory techniques to identify microorganisms in food.

CO 4: Know the contamination of food borne pathogens with various environmental factors.

Section- A: Theory

Unit I **(15 Hrs)**

Introduction to food toxicology: Scope, history and development of toxicology. Principles of food toxicology. Classifications and divisions in Toxicology.

Unit II **(15 Hrs)**

Natural toxicants present in foods - plants, animal, marine and microbial toxins. Types of these dangerous chemical substances and their effects on living organisms.

Unit III **(15 Hrs)**

Food-borne disease: fungi, bacteria, viruses, protozoa and worms. Microbial toxins- Bacteriotoxins, Mycotoxins- Outbreak of Botulism- Plant toxins- Influence of water activity in pathogenecity- Screening and Identification of toxins

Unit IV **(15 Hrs)**

Environmental factors affecting microbial growth (Intrinsic/extrinsic) influencing growth of oxygenic microorganisms, Cultivation, identification and research of oxygenic microorganisms.

Unit V **(15 Hrs)**

Toxicants formed in Processed Foods (food mutagens, carcinogens), Hazardous chemical compounds arising from processing and storing of foods. Heating and Chemical Changes. Changes occuring during Frying Food in Oil and Fats. Conservation. Radiation and Microwave Energy. Identification of toxins – Spectroscopy- HPLC, LC- MS, MASS- Spectrometry for

Text books:

1. Shibamoto, T. and Bjeldanes, L. 2009. Introduction to Food Toxicology, 2nd Ed. Elsevier Inc., Burlington, MA. -- (SB).
2. Stine, K. and Brown, T. 1996. Principles of Toxicology. CRC Press, Inc. Boca Raton, FL. 3. Manahan, Stanley. 1992. Toxicological Chemistry, 2nd Edition. Lewis Publishers, Inc. Chelsea, MI.
3. Dziezak, J. D. 1987. Rapid methods for analysis of foods. Food Technol. 41(7): 56-73.
4. Adams MR & Moss MO. Food Microbiology, New age international (P) Ltd publications, London.
5. Frazier WC & Westhoff DC, Food Microbiology 5 th edition, McGraw Hill publications, New York.

Reference books:

1. Jellifie, D.B.: Assessment of the nutritional status of the Community; World Health Organization.
2. Püssa, Tönu. 2007. Principles of Food Toxicology. CRC Press, LLC. Boca Raton, FL. 5. Watson, David. 1998.

3. Natural Toxicants in Food. CRC Press, LLC. Boca Raton, FL. 6. Klaassen, Curtis (Ed.). 2008. Caserett and Doull's Toxicology, 7th Edition. McGraw-Hill. New York, NY.

Section –B Skill component

Contact Hours per semester: **30** **Credits:** 3

1. To study the impact and classification of food toxicology
2. To analyze the toxic substances in various living organisms.
3. To study the food borne diseases caused by various types of microorganisms.
4. To study the various environmental factors which influence the microbial growth.
5. To learn the various hazardous substances causing different types of mutations.

Core 11 - INTERNATIONAL FOOD LEGISLATIONS AND STANDARDS

Contact Hours per week: 6 **Credits:** 5 (3 Theory + 2 Skill)
Contact Hours per semester: **75** **Subject Code:** B19FSC53

Course Outcome:
Students after successful completion of course will be able to

CO1: Be able to explore the history and basic ideas underlying quality management and have a detailed knowledge of the role of food laws and standards in modern management.

CO2: Demonstrate knowledge of food laws and standards systems, their implementation and the practical steps needed for implementation.

CO3: Know how to control and maintain a quality management system.

CO4: Be able to select and apply appropriate Regulations and Standards and evaluate data generated.

Unit I **(15 Hrs)**

Concepts and trends in food legislation. International and federal standards: Codex alimentarious, ISO series, food safety in USA.

Unit II **(15 Hrs)**

Legislation in Europe: Directives of the official journal of the EU, council regulations, food legislation in UK.

Unit III **(15 Hrs)**

FSSAI and its role in Food Analysis- Regulating methods for food analysis, case studies. Enforcers of Food Laws Approval Process for Food Additives Nutritional Labeling

Unit IV **(15 Hrs)**

Food laws and regulations: national food legislation, other food legislations/ authorities and their role- essential commodities act, 1955, standard of weight and measures act, 1976, export(quality control and inspection) act, 1963, voluntary based product certifications (ISI mark of BIS and agmark),

Unit V **(15 Hrs)**

International organization and agreements-food and agricultural organization (FAO), world health organization(WHO), codex alimentary, codex India, joint FAO/WHO expert committee on food additives(JECFA), world trade organization(WTO), sanitary and phytosanitary measures(SPS) and technical barriers to trade(TBT), international organization for standardization(ISO)

Reference books:

1. WHO, 1998 world health report life in the 21st centuries. Report of the director general of WHO Geneva.
2. FAO food and nutrition paper manual of food quality control – part 14/1 (1979), to 14/8 (1986) FAO of the United Nations.
3. Curriculum on food safety. Directorate general of health services. Ministry of health and family welfare. Government of India. Nirman Bhavan, New Delhi.
4. Graham, H.D. 1980: the safety of foods, AVI publishing company Inc. Westport.

Reference books:

1. Peppler, H. J., 1979, Microbial technology, Volumes I and II- Academic press, New York

2.Curricula on food safety. Directorate general of health services. Ministry of health and family welfare. Government of India. Nirman Bhavan, New Delhi.

3. Graham, H.D. 1980: the safety of foods, AVI publishing company Inc. Westport.

Section –B Skill component

Contact Hours per semester: **30** **Credits:** 2

1. Study of the impact of food legislations and international standards in India.
2. Study of the impact of food legislations and international standards in other countries.
3. Study of the violations in the food additives food laws.
4. Study of the food laws governing organizations in India.
5. Study of the food laws governing organizations in international level

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Core 12 Lab: FOOD SAFETY AND QUALITY MANAGEMENT SYSTEMS

Contact Hours per week: 5 **Credits:** 3 (3 Skill)
Contact Hours per semester: **75** **Subject Code:** B19FSP51

Section- A: Theory

Course Outcome:

Students after successful completion of the course will be able to
CO 1: Acquire knowledge on food factory and its practices
CO 2: Industrial visits offer a great source to gain practical knowledge
CO 3: To familiarize about various International organizations related to food

Experiment No.1 **(15 Hrs)**

Development of GHP and GMP Plan for a food factory- a) Identifying the key focus areas for GHP& GMP b) Identifying gaps in its implementation c) Closure plans for identified gaps in a food factory/food outlet. Exercise b and c shall be covered in Experiment

Experiment No.2 **(15 Hrs)**

Visit to the nearby Food establishment (e.g. Food joint or food factory)

Experiment No.3 **(15 Hrs)**

Development of GHP and GMP Plan for a food factory a) Identifying gaps in its implementation b) Closure plans for identified gaps in a food factory/food outlet.

Experiment No.4 **(15 Hrs)**

Development of the process flow for the Food establishment including all the inputs, outputs & interim loops

Text books:

1. Adams M.R. & Moss M.O. Food Microbiology, New Age International Private Ltd. Publications, London.
2. Frazier W.C. & Westhoff D.C. Food Microbiology, Fifth Edition, McGraw Hill Publications, New York.
3. Sri Lakhsmi Food Science 7th Edition

Reference Books:

1. Peppler H. J., 1979, Microbial Technology, Volumes I and II- Academic press, New York.
2. Handbook of Laboratory quality Management system by WHO Pages: 1 – 246.
3. Manual of food quality control in microbiological laboratory by FAO of United Nations Rome P.No. 1 – 172.

Core – 13 TRAINING

APPRENTICESHIP AT ANY FOOD INDUSTRY FOR FOOD SAFETY AND QUALITY MANAGEMENT SYSTEMS

Contact Hours per week: 5 **Credits:** 3 (3 Skill)
Subject Code: B19FSC54

Course outcomes:

CO1: Students, after successful completion of the course, will be able to narrate and compile the information and data that is used to construct and assess about the company safety and risk management programs.

CO2: Introduction review on instrumentation, labors and processing. And predict the company future developments.

ACTIVITIES

Industrial Training Report should be submitted by the students along with attendance record and evaluation sheet to the Department immediately after the completion of the training. The training Food Industries will be evaluated on the basis of the following criteria:

- Regularity in maintenance of the Food Industry.
- Adequacy & quality of information recorded.
- Drawings, sketches and data recorded.
- Thought process and recording techniques used.

FOOD PRESERVATION IN FRUITS AND VEGETABLES

Contact Hours per week: 2 **Credits:** 4 (2 Theory + 2 Skill)
Subject Code: B19FSC55

Course Outcome:
Students after successful completion of course will be able to

CO1: Identify the spoilage in fruits and vegetables and state the reason for the spoilage following safety precautions.

CO2: Identify and select fresh fruits and vegetables with the help of checklist.

CO3: Identify spices and food additives by visual inspection.

CO4: Prepare and pack perishables for storage and then store under refrigerated conditions with safety precautions.

CO5: Prepare fruit juices with juice extracting machines with safety precautions and preserve fruit juices with addition of preservatives and determine the acidity and TSS content.

Unit I **(15 Hrs)**

Current status of production and processing of fruits and vegetables, Scope of fruits and vegetables preservation in India: Product mix, availability of raw material, manpower, capital, lack of awareness, marketing facility, transport facility, availability of containers, publicity and role of government.

UNIT II **(15 Hrs)**

Juice extraction: juice, history of juicing, types of juices, process flow diagram for fruit juice production, juice extraction process- fruit selection, sorting, washing, juice extraction, deaeration, straining/filtration, clarification, adding of sugars, fortification, bottling, sealing and storage; methods of juice preservation, causes of juice spoilage.

Unit III **(15 Hrs)**

Canning: Introduction, can manufacture, canning process - selection of fruits and vegetables, grading, washing, peeling, cutting, blanching, cooling, filling, exhausting, sealing, processing, cooling and storage; types of canning- pressure canning and water bath canning, common causes of spoilage in canning of foods.

UNIT IV **(15 Hrs)**

Minimally processed fruits and vegetables: Modified atmosphere packaging (MAP): Introduction, gases used in MAP, role of N2, O2 & Co2, Principles of MAP, Types of MAP active packaging & passive packaging, factors affecting MAP, graphical representation, application of MAP, effect of MAP on shelf-life, future research needed, advantages and disadvantages; and controlled atmosphere packaging (CAP): Introduction, gases used in CAP, factors affecting CAP- Temperature control, humidity control and gas control, advantages and disadvantages.

UNIT V **(15 Hrs)**

Statutory Provisions for Quality Control in India: Prevention of Food Adulteration act, Fruit Product Order act, AGMARK act, Vegetable Oil Product order; Food Standardization and regulatory agencies in India: Central Committee for Food Standards, Central and state food departments, State Food Laboratories / Food and Drug Administration, Bureau of Indian Standards, Food Corporation of India, Army Supply Corps and Central Insecticide Board.

Reference books/ Text books

1. R. P. Srivastava & Sanjeev Kumar Fruit and Vegetable Preservation: Principles & Practices International book distributing Co. Lucknow.
2. Giridhari Lal, G.S. Siddappa & G.L. Tondon Preservation of Fruits and Vegetables CFTRI, ICAR, New Delhi -12.
3. Y. H. Hui, S. Ghazala, D.M. Graham, K.D. Murrell & W.K. Nip Handbook of Vegetable Preservation and Processing Marcel Dekker (2003)

INDUSTRIAL VISIT & REPORT

Contact Hours per week : Nil
Contact Hours per semester: Nil
Subject Code : B19FSIV5
Credits : 2 (2 Skill)

Course Outcome:

Students, after successful completion of the course, will be able to

CO1: Industrial visits offer a great source to gain practical knowledge.

CO2: Students can observe and learn as to how theatrical concepts are put to into action, thereby aiding their practical learning.

CO3: Students are exposed to real working environment and shown how things are done in an organization.

Keeping this objective at hand, the department organizes excursion tours cum industrial visits which are within the framework of the curriculum. The excursions and industrial visits are for the academic year students which are relevant to the stream of study of the programme.

SEMESTER –VI

CORE – 14 MEDICINAL PLANTS COMPOUNDS SEPARATION AND QUALITY CONTROL

Contact Hours per week: 6
Contact Hours per semester: **75**
Credits: 7 (4 Theory + 3 Skill)
Subject Code: B19FSC61

Course Outcome:

Students will be able to understand at the end of the course

CO1: It constructs the fundamental methodology to prepare different strength of solutions.

CO2: It facilitates the fellow pupil to predict the sources of mistakes and errors.

CO3: It helps to develop the fundamentals of volumetric analytical skills.

CO4: It peculates the basic knowledge in the principles of electrochemical analytical techniques.

CO5: The student interpretation skills will be improved by the course content in terms of choice of analytical techniques to perform the estimation of different category drugs.

Unit I **(16 Hrs)**

Ethnobotany - Concept, scope and importance; principles and methods for conservation of medicinal and aromatic plants.

Unit II **(16 Hrs)**

Diversity of medicinal and aromatic plants, assessment of diversity; Chemical composition of medicinal plants – *Azadiracta indica*, *Asparagus racemosus*, *Aloe vera*, *Withania somnifera*, *Andrographis paniculata* .

Unit III **(12 Hrs)**

Principle, techniques and types of chromatography and spectroscopy. Basic water, juices and analytical methods applicable

Unit IV **(15 Hrs)**

Secondary metabolites – concept and importance, chemical structure and uses of secondary metabolites.

Unit V **(16 Hrs)**

Concept of quality control and its methods, quality assurance & total quality controls. Quality control of raw materials & finished products. Documentation concepts of statistical quality control.

Text Books / Reference:

1. Biochemical methods – Themaiya.
2. Biochemical methods – Sadashivam and Manikam
3. A text book of Quantitative inorganic analysis – I.A. Vogel.
4. Quantitative analysis – Day and Underwood.
5. Instrumental methods of Analysis – W. Merritt and Dean.

Section –B Skill component

Contact Hours per semester: **30** **Credits:** 3

1. To study the principles and conservative methods of aromatic compounds.
2. To analyze the diversity of microorganisms in various medicinal plants.
3. To study the principles and methods of various chromatography and spectroscopy.
4. To evaluate the chemical structure and importance of secondary metabolites.
5. To study the quality control and quality assurance of finished products.

Core 15 - HYGENIC DESIGN OF FOOD PROCESS EQUIPMENT

Contact Hours per week: 6 **Subject Code:** B19FSC62
Contact Hours per semester: **75** (45 Theory + 30 Skill) **Credits:** 6 (3 Theory + 3 Skill)

Course Outcome

The student will know about

CO1: The detailed interpretation pattern for the organic substances

CO2: Theoretical aspects of the various instrumental techniques

CO3: Practical aspects and troubleshooting techniques various instrumental techniques

CO4: Knowledge and skills in advanced instrumentation techniques for drug analysis

CO5: Theoretical aspects of hyphenated analytical techniques

CO6: Critical analysis of analytical problem and selection of appropriate analytical tool for the quantification of chemicals and excipients

Section- A: Theory

Unit I **(15 Hrs)**

Microbiologically safe continuous pasteurization of liquid foods, method for the assessment of in-line sterilisability of food processing equipment, Method for the assessment of bacteria-tightness of food processing equipment.

Unit II **(15 Hrs)**

Hygienic equipment design criteria: Hygienic design of closed equipment for the processing of liquid food, Hygienic design of equipment for open processing.

Unit III **(15 Hrs)**

Hygienic pipe couplings, Hygienic design of pumps, homogenisers and dampening devices, Passivation of stainless steel, method for assessing the bacterial impermeability of hydrophobic membrane filters.

Unit IV **(15 Hrs)**

General hygienic design criteria for the safe processing of dry particulate materials, Production and use of food grade lubricants, prevention and control of *Legionella* spp. (incl Legionnaires Disease) in Food Factories.- Food labeling and its importance

Unit V **(15 Hrs)**

Safe Storage and Distribution of Water in Food Factories, Safe and hygienic water treatment in food factories, Packing systems for solid foodstuffs, Air Handling in the Food Industry, Hygienic Engineering of fluid bed and spray dryer plants, Materials of construction for equipment in contact with food.

Section- B: Skill

Text books/ References:

1. Ahvenainen R. 2001. Novel Food Packaging Techniques. CRC.
2. Mahadeviah M & Gowramma R. 1996. Food Packaging Materials. Tata McGraw Hill.
3. Stanley S & Roger CG. 1998. Food Packaging. AVI Publ.
4. AACC. 2004. Storage of Cereal Grains and their Products.
5. Mahajan & Goswami. 2005. Food and Process Engineering.
6. Ojha TP & Michael AM. 2006. Principles of Agricultural Engineering. Jain Brothers.

Section – B: Skill Component

Contact Hours per semester: **30** **Credits:** 3

1. To study and analyze the food processing equipments.
2. To analyze the hygienic properties of food and food producing equipments.
3. To study about hygienic properties of pump, homogenizers and hydrophobic membrane filters.
4. To study the hygienic design criteria of lubricants and materials in food producing factory.
5. To study the safe storage, water treatments and packing system of foodstuffs.

Core 16 - FOOD ANALYSIS AND ADULTERATION TESTING (FAAT)

Contact Hours per week: 5 **Credits:** 5 (3 Theory + 2 Skill)
Contact Hours per semester: **75** **Subject Code:** B19FSC63

Course Outcome:

CO1: Be able to explore the history and basic ideas underlying quality management and have a detailed knowledge of the role of food laws and standards in modern management.
CO2: Demonstrate knowledge of food laws and standards systems, their implementation and the practical steps needed for implementation.
CO3: Know how to control and maintain a quality management system.
CO4: Be able to select and apply appropriate Regulations and Standards and evaluate data generated.

Unit I **(15 Hrs)**

Definition – History – Food science concept – Basic SI unit of length, volume and weight, temperature, relative density and pH – Physical and chemical properties of food – Boiling point, evaporation, melting point, smoke point, surface tension, osmosis, humidity, freezing point and specific gravity.

Unit II **(15 Hrs)**

Constituents of food, true solution, suspension, stability of colloidal system type of colloidal system in food – Sol, gel, emulsion, foam health food, ethnic food, organic food, functional food, nutraceuticals, fabricated foods, convenience foods, gm foods and space foods.

Unit III **(15 Hrs)**

Food additives – Antioxidants, sequestrants, preservatives, nutrient supplement, emulsifiers, stabilizers and thickening agents – Bleaching and maturing agent – Sweeteners, humectants and anti caking agents – Coloring and flavoring substance – Food adulteration: types of adulterants – Intentional and incidental adulterants – Methods of detection.

Unit IV **(15 Hrs)**

Population and sample methods of sampling – Sensory evaluation methods- Simple random sampling, systematic sampling, stratified random sampling summary measures –

Measures of central tendency – Arithmetic mean, Geometric mean, Harmonic mean, Median and Mode.

Unit V **(15 Hrs)**

Food safety and quality assurance – Definition evaluation of food – Subjective and objective food standards – PFA, BIS, AGMARK, FPO, FAQ and ISI.

Text Books / References:

1. Sree lakshmi, Food science, new age international Publishers, Chennai.
2. Silley, P and S. Forsythe, (1996). Impedance Microbiology- a rapid change for microbiologists- A review. Journal of Applied Bacteriology, 80: 223- 243
3. Dziezak, J. D. 1987. Rapid methods for analysis of foods. Food Technol. 41(7): 56-73.
4. Johnson Green, Perry (2002). Diagnostic systems. In Introduction to Food Biotechnology, CRC Press, Florida.

Section –B Skill component

Contact Hours per semester: **30** **Credits:** 2

1. To study about the physical and chemical properties of food.
2. To analyze the constituents and nutraceuticals of a food.
3. To study about the food additives, adulterants and detective methods.
4. To study about the food sampling methods and sampling measures.
5. To study the objective and subjective food standards in various food products.

Core 17 – LAB: FOOD ADULTERATION TESTING

Contact Hours per week: 5 **Credits:** 3 (3 Skill)
Contact Hours per semester: **75** **Subject Code:** B19FSP61

Course Outcome:

CO1: Analyze and communicate issues relevant to food processing technology and food quality management systems.

CO2: Perform experiments assessing the effect of processing conditions on quality parameters.

CO3: Communicate the science and technology involved in food processing and quality assurance through IT implemented reports and presentations.

CO4: Review and report upon the latest scientific literature pertaining to the areas of Food Processing and Quality Assurance.

Experiments:

1. Detection of Vanaspati in Ghee/Butter
2. Detection of Khesari flour in besan
3. Detection of Metanil yellow in turmeric/colourd sweet products
4. Detection of Argemone oil in edible oil

5. Detection of artificially colour / foreign matter in tea (dust/leaves)
6. Detection of sodium bicarbonate in jaggery.
7. Detection of rhodamine B in sweet potato.

Reference:

A treatise on Analysis of Food, Fats and Oils: A. R. Sen, N.K. Pramanik and S.K. Roy.

Section –B Skill component

Contact Hours per semester: **30** **Credits:** 3

1. To study about the toxic substances are added to food, or some valuable nutrients are removed from food items
2. To analyze the adulterated food is generally defined as impure, unsafe, or unwholesome food.
3. To study about the Food adulteration may be done intentionally or unintentionally.
4. To analyze the traders or manufacturers who want to make a quick economic profit sell adulterated food intentionally.
5. To analyze the unintentional adulteration happens when people are not aware of the rules, regulations and methods of preparing wholesome food.

Core – 18 TRAINING

APPRENTICESHIP AT ANY FOOD INDUSTRY FOR FOOD ANALYSIS AND ADULTERATION TESTING

Contact hours per week: 5 **Credits: 3**

Subject Code : B19FSC64

Course outcomes:

CO1: Students, after successful completion of the course, will be able to narrate and compile the information and data that is used to construct and assess about the company safety and risk management programs.

CO2: Introduction review on instrumentation and predict the company future developments.

ACTIVITIES

Industrial Training Report should be submitted by the students along with attendance record and evaluation sheet to the Department immediately after the completion of the training. The training Food Industries will be evaluated on the basis of the following criteria:

- Regularity in maintenance of the Food Industry.
- Adequacy & quality of information recorded.
- Drawings, sketches and data recorded.
- Thought process and recording techniques used.

PROCESSED FOOD PACKAGING IN MILK PRODUCTS

Contact Hours per week: 2 **Credits:** 4 (2 Theory + 2 Skill)
Subject Code: B19FSC65

Course Outcome:

CO1: The learner will be able to understand the current status of dairying, market milk industry, cooperative movement and operation flood (OF) programme in India.

CO2: The learner will be able to understand the food and nutritive value of milk, milk carbohydrate (Lactose), milk Fat, milk Protein, vitamins & minerals and milk Enzymes.

CO3: The learner will be able to understand the genetic factor and external factor.

CO4: At the end of this module the learner will be able to understand the Milk processing and dairy plant requirements and its management.

Unit I **(15 Hrs)**

Introduction, Importance of Packaging, History of Package Development, Packaging materials, a) Characteristics of basic packaging materials: Paper (paper board, corrugated paper, fibre board). Characteristics of Glass and Metal, Characteristics of Plastics, Foils and laminates, retort pouches. Package forms, Legal requirements of packaging materials and product information

Unit II **(15 Hrs)**

Packaging of milk and dairy products such as pasteurized milk, UHT-sterilized milk, Aseptic packaging, fat rich products-ghee and butter, Coagulated and desiccated indigenous dairy products and their sweet mead, Concentrated and dried milks including baby foods, Packaging of functional dairy/food products

Unit III **(15 Hrs)**

Modern Packaging Techniques; Vacuum Packaging, Modified atmosphere packaging (MAP), Eco-friendly packaging, Principles and methods of package sterilization, Coding and Labelling of Food packages,

Unit IV **(15 Hrs)**

Aseptic Packaging (AP), Scope of AP and pre-requisite conditions for AP, Description of equipment (including aseptic tank) and machines- Micro-processor controlled systems employed for AP, Package conditions and quality assurance aspects of AP

Unit V **(15 Hrs)**

Microbiological aspects of packaging materials, Disposal of waste package materials, Packaging Systems, Hazards from packaging materials in food.

Text Books / References:

1. Outlines of Dairy Chemistry, De S; Oxford.
2. Milk Processing and Technology by A Q Khan, Allahabad Publication.
3. Milk & Milk Processing; Herrington BL; 1948, McGraw-Hill Book Company.
4. Modern Dairy Products, Lampert LH; 1970, Chemical Publishing Company.

Section –B Skill component

Contact Hours per semester: **30** **Credits:** 2

1. To analyze the Visit to shop floor outfit and generate general ideas about the work atmosphere trade.
2. To study about the identify safety signs for danger, warning, caution & personal safety message and hygiene.
3. To analyze the use of personal protective equipment (PPE).
4. To study about the importance of cleanliness, hygiene, sanitation in self life and milk product.
5. To study of familiar Dairy Products and visit to market.
6. To analyze the visit to Milk Co-Op Society.
7. To study of packaging equipments and machinery used in dairy industry.
8. To analyze the collection of various types of packaging material used for the packaging of dairy products.
9. To analyze the Need and importance of packaging methods and storage conditions of dairy products.

INDUSTRIAL VISIT & REPORT

Contact Hours per week **:** Nil **Subject Code :** B19FSIV6

Contact Hours per semester: Nil **Credits** **:** 2 (2 Skill)

Course Outcome:

Students, after successful completion of the course, will be able to

CO1: Industrial visits offer a great source to gain practical knowledge.

CO2: Students can observe and learn as to how theatrical concepts are put to into action, thereby aiding their practical learning.

CO3: Students are exposed to real working environment and shown how things are done in an organization.

Keeping this objective at hand, the department organizes excursion tours cum industrial visits which are within the framework of the curriculum. The excursions and industrial visits are for the academic year students which are relevant to the stream of study of the programme.

Program Name: Bachelor of Science
Discipline : Physical Education
(For those who Join in 2019 and after)

Semester	Part	Subject	Hour	Credit	Int+Ext= Total	Subject Code	Focus on Employability/ Entrepreneurship/ Skill Development	Revised/ New/ No Change/ Interchanged If Revised % of Change
V	Core	Physiology of Exercise	6	4	25+75=100	U19PEC51	Skill Development	New
	Core	Basics of Sports Training	6	4	25+75=100	U19PEC52	Skill Development	New
	Core	Methods in Physical Education	5	3	25+75=100	U19PEC53	Employability	New
	Core Practical	LAB - Theory of Games and sports – I Ball badminton , Badminton ,Cricket, Swimming.	4	3	100+0=100	U19PEP51	Skill Development	New
	NME	Yoga and Health	2	2	25+75=100	U19PEN51	Skill Development	New
	SBS	Employability Skill	2	2	25+75=100	**U1PS51**	Skill Development	
	Skill Based Practical	LAB - Test and Measurement (Record)	5	4	100+0 =100	U19PES5P	Skill Development	New
VI	Core	Introduction to Kinesiology and Bio Mechanics in Sports	6	4	25+75=100	U19PEC61	Employability	New
	Allied	Rules and Regulations of Track and Field Events– III	6	4	25+75=100	U19PEA61	Skill Development	New
	Core	LAB - Game of Specialization	5	4	40+60=100	U19PEP61	Skill Development	New
	Allied Practical	LAB - Rules and Regulations of Track and Field Events– IV	4	4	40+60=100	U19PEP62	Skill Development	New
	Allied	Athletics Care and First Aid	5	4	25+75=100	U19PEA62	Skill Development	New
	Skill Based Practical	LAB-Teaching Lessons	5	4	40+60=100	U19PES6P	Entrepreneurship	New
	Elective Subject	Project and Viva	5	5	40+60=100	U19PE6PR	Employability	New
	NME	Yoga for Wellness	2	2	25+75=100	U19PEN61	Skill Development	New

PART III
SEMESTER-V
CORE PAPER – PHYSIOLOGY OF EXERCISE

Contact hours per week: 6 Credits : 4
Contact hours per semester: 90 Subject Code: U19PEC51

COURSE OUTCOMES:

To enable the students to

CO1: Understand the meaning, nature and scope of exercise physiology
CO2: Analyze the effects of exercise physiology on various systems of the body
CO3: Understand the properties, structure and functions of voluntary muscles
CO4: Analyze the physiological concepts of physical fitness
CO5: Understand the physiological factors affecting motor ability.

UINIT I: INTRODUCTION (15 Hours)

Physiology and Exercise Physiology – meaning and definition -Need and Importance of Exercise Physiology-Historical Aspects of Exercise Physiology-Acute and Chronic Responses to Exercise.

UNIT II: CARDIORESPIRATORY PHYSIOLOGY (15 Hours)

Types of blood circulation and respiration - Effect of exercise on cardiovascular system and Respiratory system.

UNIT III: MUSCLE AND NERVOUS PHYSIOLOGY (15 Hours)

Effect of exercise on Muscular, Skeletal system and Nervous System - Muscle tone – Types of Muscular contraction

UNIT IV: METABOLISM AND ENVIRONMENT

Metabolism – Aerobic and Anaerobic Metabolism – Exercise risks at Cold, Hot and High Altitude.

UNIT V: PHYSIOLOGICAL FACTORS AFFECTING MOTOR ABILITY (15 Hours)

Physiological factors affecting skills and motor ability - warming up - fatigue -oxygen debt - second wind – doping and its influences on Physiology.

SELF STUDY

TEXT BOOK

Sivaramakrishnan.S., 2006, "Anatomy and Physiology for Physical Education", First Edition, Friends Publication., Chennai.

KenneyW. Larry,Jack H. Wilmore&David L. Costill (2012). Physiology of Sport and Exercise. Champaign, IL: Human Kinetics.

Ball State University, Muncie, Indiana

REFERENCE BOOKS

1. Blaisdall, A., 2006, "Human Physiology", Sports Publications, Chennai.
2. Marieb.N., 2006, "Human Anatomy and Physiology", Benjamin Publication, New Delhi.
3. Sivaramakrishnan.S., 2006, "Physiology of Sports", First Edition, Friends Publication,Chennai.
4. Budhe, A.A., 2013, "Exercise Physiology", Sports Publications, Chennai.
5. Rajeev, K., 2011, "Sports Medicine and Exercise Physiology", First Edition, Sports Publications, Chennai.

CORE - BASICS OF SPORTS TRAINING

Contact hours per week:6 Credits:4
Contact hours per semester:90 Subject Code : U19PEC52

COURSE OUTCOMES:

To enable the students to

CO1: Learn the fundamentals of sports training
CO2: Understand the concepts of strength and endurance
CO3:Acquire the knowledge of motor components speed, flexibility and coordination
CO4: Obtain knowledge of technical and tactical preparations
CO5: Get the knowledge of training plans and periodization.

UNIT I: INTRODUCTION TO SPORTS TRAINING (15 Hours)

Sports Training: Meaning - aim and characteristics of sports training -Components of training load: Volume, Intensity, and Density - Types of load - Principles of sports training - Super compensation.

UNIT II: TRAINING PLANS AND PERIODISATION (15 Hours)

Meaning of Training sessions and Training Plan - Definitions and meaning of Periodization – Multilateral Physical Development, Technical, Tactical and Psychological Training.

UNIT III: STRENGTH AND ENDURANCE (15 Hours)

Strength: Forms of strength - factors determining strength - methods of strength development. Endurance: Forms of endurance - factors determining endurance - Methods of endurance development.

UNIT IV: SPEED, FLEXIBILITY (15 Hours)

Speed: Forms of speed - factors determining speed - Methods of speed development Flexibility: Forms of flexibility - factors determining flexibility - methods of development of flexibility.

UNIT V: COORDINATION, AGILITY, AND TYPES OF TRAININGS (15 Hours)

Coordination and Agility – meaning and definition- Importance of Agility and Coordination in sports – Types of Trainings - Aerobic Training - Circuit Training - Weight Training - Interval Training – Fartlek.

SELF STUDY

TEXT BOOK

Sebastian. P.J., 2013, "System of Sports Training", Friends Publications, Chennai.

REFERENCE BOOKS

1. Mishra S. C., 2009, "Sports Training", Sports Publication. Chennai.
2. Kawade, R. R., 2013, "Sports Training" Sports Publications, Chennai.
3. Arvind, B., Qureshi and Dabir., 2012. "Encyclopaedia of Sports Training", Sports Publications, Chennai.
4. Yogaraj. T., 2003, "Sports Training," Sports Publication, Chennai.

CORE - METHODS IN PHYSICAL EDUCATION

Contact hours per week: 5 Credits : 3
Contact hours per semester : 90 Subject Code : U19PEC53

Course Outcomes:

Students, after successful completion of the course, will be able to

CO1: Learn the factors influencing methods in physical education
CO2: To understand the methods of teaching aids
CO3: Learn about the lesson plan.
CO4: Study the methods of teaching physical activities
CO5: Draw the fixtures of league and knock-out tournaments

UNIT I: INTRODUCTION OF METHODS IN PHYSICAL EDUCATION(15 Hours)

Introduction: Meaning of method - factors influencing method - subject matter - the experience of the pupils – situations – time and material at the disposal of the teacher - scientific principles. Presentation Technique: Planning and presentation - steps in the way of presentation

UNIT II:TEACHING AIDS (15 Hours)

Teaching Aids - Community - co-curricular activities - Audio-visual aids. Class management: Principles - general and specific points for a proper class management - Commands: Response command - rhythmic command.

UNIT III:LESSON PLAN (15 Hours)

Lesson plan - Meaning - value of lesson plan - types of lesson plan - General lesson plan and Particular lesson plan.

UNIT IV:TEACHING OF PHYSICAL ACTIVITIES (15 Hours)

Teaching of physical activities: Calisthenics - Marching - Indigenous activities - Minor games .

UNIT V: TOURNAMENTS (15 Hours)

Tournaments: Knock-out or elimination tournaments -- league or round robin tournament - combination Tournament - challenge tournament.

SELF STUDY

NOTE:

Students are asked to prepare a general lesson plan and to take the practical class, which will be assessed as one of the assignments.

TEXT BOOK

Verma ,H., 2012, "Methods and Management of Physical Education", First Edition, Sports Publications, Chennai.

EFERENCE BOOKS

1. Athicha . P., 2007, "Methods in Physical Education", South Indian Publication,Chennai.
2. Sivaramakrishnan. S. 2006, "Statistics in Physical Education", First Edition,
3. Bevinson perinbaraj .S.2013 "Methods in physical education ", Vinci agencies , Karaikudi
4. Mojumdar and R. Mohum., 2009, " Methods in Physical Education", Sports Publications, New Delhi.
5. Gopalakrishnan, R.W. 2012, "Teaching Methods of Physical Education", SportsPublications, New Delhi

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LAB - THEORY OF GAMES AND SPORTS – I
BALL BADMINTON , BADMINTON, CRICKET, SWIMMING

Contact hours per week : 4 Credits : 3
Contact hours per semester: 75 Subject Code : U19PEP51

SYLLABUS:

Students shall demonstrate any two of the skills in following games and sports .
SKILLS : Fundamental skills , offensive skills , defensive skills .(Any five skills)
OFFICIATING: Officiating signals and preparation of score sheet.

Students should select any two of the games and sports.

1. BADMINTON
2. BALLBADMINTON
3. CRICKET
4. SWIMMING

TEXT BOOK

Thakur, J.K., 2013 "Measurement of Playing Field", Sports Publications, New Delhi

REFERENCE BOOKS.

- Monika, A., 2005, "swimming", Sports Publications, First edition New Delhi.
- Monika, A., 2005, "Cricket", Sports Publications, First edition, New Delhi.

NME : YOGA AND HEALTH

Contact hours per week: 2 Credit : 2
Contact hours per semester:30 Subject Code : U19PEN51

UNIT I : **(6hrs)**

Health – Meaning – Definition – Factors Affecting Health – Physical Fitness - Health Related Physical Fitness – World Health Day .

UNIT II : **(6hrs)**

Yoga – History – Meaning – Definition – Need And Importance – International Yoga Day – Yoga And Human Health .

UNIT III : **(6hrs)**

Steps ofyoga – Various Stages – Surya Namaskar

UNIT IV : **(6hrs)**

Asanas – Meaning – Procedure To Perform Asanas – Classification Of Asanas – Padmasana – Vajrasana – Vakrasana – Pachimotasana –Virchakasana – Trikonasana – Padahasthasana – Arthachakrasana-Halasana – Bhujangasana –Sarvangasana – Dhanurasana – Shavasana –Makarasana .

UNIT V : **(6hrs)**

Pranayama – Meaning – Definition – Aspects of Pranayama – Anunasika – Suryabadhana - Chandrabedhana – Kabalabhati – Suga Pranayama .

References:

1. Endrumnal vazvudharumThirumularin PanniruYogangal ,N.Ramakrishnan, Manivasakar Publication, Chennai, 2003.
2. Sri Patanjali yoga sutra
3. The yoga tradition, George Feuerstein, motialBanarsidass Publishers Pvt. Ltd., Delhi,2002.
4. Science of yoga, I.K.Taimini, Therosophical Publishing House, Adayar, Chennai, 2001.
5. Foundations of Physical Education and Sports (12Ed). D.A.Wuest and C.A.Bucher (1995). St.Louis: Mos by Company
6. Sound Health Through, K.Chandra Sekaran, Prem Kalyan Publications, Madurai, Tamilnadu, India – 1999.
7. Asana Pranyama Mudra Bandha by Swami Saithansansha Saraswathi, yoga publication trust, munget, Bihar, India, Second edition – 1973

SBE- EMPLOYABILITY SKILLS

Contact Hours per week: 2 **Subject Code: U1PS51**
Contact Hours per Semester: 30 **Credits: 2**

Objectives:

To enrich the Employability Skills by imparting Reasoning skills, Aptitude skills and General Knowledge.

Unit I : Quantitative Aptitude – Averages, Percentage, Profit & Loss, Ratio & Proportion, Time & Work, Time & Distance, Clock. **(6-hours)**

Unit II : Quantitative Aptitude –Problems on Ages, Boat & Stream, Simple Interest, Compound Interest, Area, Partnerships **(6-hours)**

Unit III: Reasoning **(6-hours)**

Verbal Reasoning - Analogy, Classification, Series, Coding & Decoding, Blood Relations, Direction Sense Test.

Unit IV: Reasoning **(6-hours)**

Verbal Reasoning - Number Test, Ranking & Time sequence Test, Alphabet Test, Logical Venn Diagrams.

Unit V: **(6-hours)**

General Knowledge: Abbreviations, Acronyms, Famous Personalities, Important Days, Capital Cities, Currencies, Books and Authors, Inventions.

Reference Books:

1. Verbal & Non Verbal Reasoning - R.S.Aggarwal
2. Quantitative Aptitude - R.S.Aggarwal
3. Subjective & Objective Quantitative Aptitude - R.S.Aggarwal
4. Malayala Manorama Year Book, 2014

SBE: LAB – TEST AND MEASUREMENT

Contact hours per week: 5 Credits :4
Contact hours per semester: 60 Subject Code : U19PES5P

SYLLABUS :

Students will organize and administration of any two Tests from the following (One from physical fitness and another three from games)

PHYSICAL FITNESS TEST

SDAT AND SAI FITNESS TESTS

Copper's Aerobic Test (Copper's12/9 *min run/walk) – (cardio vascular endurance)*

- AAPHERD Health Related Physical FitnessTest
- Harvard Step Test
- Barrow Motor Ability Test
- AAPHERD Youth FitnessTest

GAMES :

1.BADMINTON - French Short ServiceTest
- Gsc Badminton Clear Test

2. BASKET BALL - Leilich Basketball Test Bounce AndShoot
3. HOCKEY - Henry Friedel Field Hockey Test
4. VOLLEYBALL - Modified Brady VolleyballTest
5. FOOTBALL - Mc Donald Soccer Skill Test
6.TENNIS - Hewitt Tennis Service Placement

SEMESTER VI

PART III – CORE THEORY

INTRODUCTION TO KINESIOLOGY AND BIO MECHANICS IN SPORTS

Contact hours per week: 6 Credits : 4
Contact hours per semester: 90 Subject Code : U19PEC61

COURSE OUTCOMES:

Students, after successful completion of the course, will be able to understand about the

CO1: Understand the concepts of kinesiology
CO2: Learn the origin of the muscles
CO3: Obtain the concepts of Bio-mechanics and motions.
CO4: Know about the kinematics.
CO5: Learn about the kinetics.

UNIT I: INTRODUCTION OF KINESIOLOGY (15 Hours)

Introduction: Meaning - history - aim - objectives of kinesiology for physical education and sports. Terminology of fundamental movements.

UNIT II: LOCATION AND ACTION OF MUSCLES (upper extremity) (15 Hours)

Classification of muscles - Location and action of muscles at various joints: Upper extremity- pectoralis major - pectoralis minor - deltoid - biceps brachii - triceps -

UNIT III: LOCATION AND ACTION OF MUSCLES (lower extremity) (15 Hours)

Lower extremity: Rectus femoris - vastus group - sartorius - biceps femoris –glutes maximus - gasatrocnemius.

UNIT IV: INTRODUCTION OF BIOMECHANICS (15 Hours)

Biomechanics: Meaning,aim, objectives and importance of Biomechanics in Physical Education and Sports. Linear kinematics: Speed – velocity - acceleration - Angular speed - angular velocity - angular projectile motion. Spin – Topspin - Legspin .

UNIT V: KINETICS (15 Hours)

Linear kinetics: Mass - weight - force - pressure - work - power - energy - impulse - momentum - impact - friction - Newton's laws of motion. Angular kinetics: - levers - equilibrium.

SELF STUDY

TEXT BOOK

Vijayalakshmi. L, 2005, "Biomechanics of Body movements in Sports" First Edition, Sports Publication, Chennai.

REFERENCE BOOKS

1. Bijlani. R., and S.K Manchanda, 2002, "The Human Machine", First Edition, National Book Trust India, New Delhi.
2. Dhanajoy .S, 2000, "Mechanical Basics of Biomechanics", First Edition, Sports Publication Chennai.
3. Anderson, T.M., 2003, "Biomechanics of Human Motion", First Edition, Sports Publication Chennai.
4. Dhanajoy. S., 2005, "Pedagogic of Kinesiology", Sports Publication, Chennai.
5. Dhanajoy .S, 2000, "Mechanical Basics of Biomechanics", Sports Publication, New Delhi.

ALLIED - RULES AND REGULATION OF TRACK AND FIELD EVENTS - III

Contact hours per week: 6 Credits :4
Contact hours per semester: 60 Subject Code : U19PEA61

UNIT – I : POLEVAULT (15 Hours)

Pole Vault - Rules and interpretations - Grip – Approach Run - Planting - Take off – Swing - Rock back – push – Bar clearance and landing.

UNIT – II HAMMER THROW (15 Hours)

Hammer Throw - Rules and interpretations –Holding the Hammer - Preliminary Swing - Turn - Delivery - Follow-through.

UNIT – III JAVELIN THROW (15 Hours)

Javelin Throw - Rules and interpretations - Grip – Approach Run - Withdrawal - Cross Over stride or impulse stride - Release and follow-through.

UNIT – IV 400 M Run (15 Hours)

400M Run – Rules and interpretations - Starting - Tactics and Techniques of running andFinishing the race.

UNIT – V COMBINED EVENTS (15 Hours)

Triathalon, Pentathalon, Heptathalon, Decathalon, Steeple Chase.

TEXT BOOK

Vaison. C.K., 2014 "Competition Rules Hand Book". Athletic Federation of India, New Delhi.

REFERENCE BOOKS

1. Monika, A., 2005 "Athletics Coaching Manual". Sports Publication, New Delhi.
2. Sandhu, V., 2006 "Teaching & Coaching Athletics". Sports Publication, NewDelhi.
3. Sharma, N.P., 2005 "Fundamentals of Track and Field", First Edition, KhelSahitya Kendra, New Delhi.

CORE LAB - GAME OF SPECIALIZATION

Contact hours per week : 5 Credits :4
Contact hours per semester : 75 Subject Code : U19PEP61

COURSE OUTCOMES:

Students, after successful completion of the course, will be able to

CO1: To acquire practical knowledge on games
CO2: To obtain the experience in tactics , strategy and advance skills .
CO3: To be familiar with techniques and tactics in Basketball and Football
CO4: To obtain the experience in advanced skill in Hockey and Kabaddi .
CO5: To understand the strategic in Tennis ,volleyball and Handball.

Coaching, officiating and playing ability in :

1. Basketball
2. Handball
3. Kabaddi
4. Kho – kho
5. Tennis
6. Volleyball
7. Football
8. Hockey

SELF STUDY

TEXT BOOK

Thakur, J.K., 2013 "Measurement of Playing Field", Sports Publications, New Delhi

REFERENCE BOOKS

1. Kirubakar, and S. Glady., 2009, "Tennis Skills: A Teacher's Guide", First edition, S.S.Publications, Chennai.
2. Monika, A., 2005, "Cricket Coaching Manual", Sports Publications, First edition, New Delhi.
3. Monika, A, 2005, "Hockey Coaching Manual", Sports Publications, First edition, New Delhi.
4. Bhari. B., 2010, "Layout of Play Field", Sports Publications, New Delhi.
5. Monika, A., 2005, "Basketball", Sports Publications, First edition, New Delhi.
6. Monika, A., 2005, "Volleyball", Sports Publications, First edition, New Delhi.
7. Monika, A., 2005, "Kabaddi", Sports Publications, First edition,New Delhi

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ALLIED PRACTICAL
LAB - RULES AND REGULATION OF TRACK AND FIELD EVENTS - IV

Contact hours per week:4 Credits :4
Contact hours per semester:60 Subject Code : U19PEP62

SYLLABUS:

Students Will Execute Any Two Events :

POLE VAULT - Pole grip, carry and run, pole plant, take off, rock back, pull up, push up, bar clearance and landing.

HAMMER THROW - Grip, initial stance, preliminary swings, entry (or) transition from swings to turn, turns, delivery stance, delivery action and reverse.

JAVELIN THROW - Grip, carry, approach run, last five strides rhythm including impulse stride, delivery stance, delivery and reverse.

400METERS - Correct running style emphasizing on proper body position, - crouch startfixing of the starting blocks getting off the block, - practice of starts with blocks using proper command and curve running.

TEXT BOOK

Vaison. C.K., 2014 "Competition Rules Hand Book". Athletic Federation of India, New Delhi.

REFERENCE BOOKS

1.Monika, A., 2005 "Athletics Coaching Manual". Sports Publication, New Delhi.
2.Sandhu, V., 2006 "Teaching & Coaching Athletics". Sports Publication, New Delhi.
3.Sharma, N.P., 2005 "Fundamentals of Track and Field", First Edition, Khel Sahitya Kendra, New Delhi.
4.IAAF competition rules 2016

ALLIED –ATHLETICS CARE AND FIRST AID

Contact hours per week: 5 Credits : 4
Contact hours per semester: 75 Subject Code : U19PEA62

Unit I: Introduction (15 Hours)

Definition, Need, Nature and Scope of Sports Medicine- Importance of Sports Medicine in Physical Education and Sports – Concept of injury management.

Unit II: Athletic injuries (15 Hours)

Meaning and types of Sprain, Strain, Contusion, Fracture, Dislocation, Abrasion and Puncture.

Unit III: First Aid (15 Hours)

Definition - Importance of First Aid –PRICE technique –Massage- First-aid for Shock, Drowning, Bleeding,Fractures, Sprain, Strain, Dislocation and Fainting.

Unit IV: **Injury Management (15 Hours)**

Principles Pertaining to the Prevention of Sports Injuries- Care and Treatment of Exposed and Unexposed Injuries in Sports - Principles of apply Cold and Heat - Principles and Techniques of Strapping and Bandages.

Unit V: Posture (15 Hours)

Definition and Objectives of Corrective Physical Education - Posture and Body Mechanics, Standards of Standing Posture- Value of Good Posture, Drawbacks and Causes of Bad Posture.

Reference

1. Starkey, Chad/Therapeutic Modalities of Athletic trainers, F.A. Davis Company, Philadelphia, 1990.
2. Prentice Williams, E., Therapeutic Modalities Sports Medicine: ST. Louis, 1990.
3. Sundararajan / Sports Medical Lectures: Rosan Publication, Chennai.
4. Edward Donald, Physiotherapy Occupations Theraphy and gymnastics, London.
5. St.John Ambulance, etc., First Aid Manual: St. John Ambulance, London, 1997.
6. Pande P.K. and L.C, Gupta, Outline of Sports Medicine: Jaypee Brothers, New Delhi, 1987.

SBS LAB - TEACHING LESSONS

Contact hours per week: 5 Credits: 4
Contact hours per semester: 75 Subject Code : U19PES6P

TEACHING PRACTICE IN PHYSICAL EDUCATION

GENERAL LESSON PLAN

1. Assembly and Roll call
2. Introductory part (Warming-up)
3. Formal part
4. Special part
5. Recreative part
6. Assembly and dismissal

PARTICULAR LESSON PLAN

1. Assembly and roll call
2. Suitable warming-up
3. Teaching of fundamentals
4. Practice of fundamentals
5. Lead-up activities
6. Whole game
7. Assembly and dismissal

Practice Teaching includes observation and teaching practice in the college. Students are required to complete 3 general and 3particular lessons in the College Premises under the supervision of the assigned teaching faculty in the department.

TEXT BOOK

Athicha . P., 2007, "Methods in Physical Education", South Indian Publication, Chennai.

REFERENCE BOOKS

1. Verma ,H., 2012, "Methods and Management of Physical Education", First Edition, Sports Publications, Chennai.
2. Mojumdar and R. Mohum., 2009, " Methods in Physical Education", Sports Publications, New Delhi.
3. Gopalakrishnan, R.W. 2012, "Teaching Methods of Physical Education", Sports Publications, New Delhi.
4. Arya S.K., 2013 , "Methods in Physical Education", Sports Publications, New Delhi.

PROJECT AND VIVA

Contact hours per week: 5 Credits : 5
Contact hours per semester: 75 Subject Code : U19PE6PR

Course Outcome:

To enable the students to
CO1: Organize a sports meet as a project in any sport.
CO2: Enhance the knowledge in organizing and administrating capability of the students .

Rules governing the evaluation of the project meet and Report

1. Students can organize or take part in the organizing part in any game or sport. (ex-School meet, state games or tournament,)
2. The Project meet report should be submitted to the Controller of the examination within the stipulated period through the Head of the department.
3. Each student has to submit two copies of his /her project report for evaluation.
4. The project meet report shall contain a minimum of 20 pages .
5. The project meet valued for 100 marks. The valuation procedure is
   Internal project meet – 40 marks
   External - - 60 marks (viva +Project meet report)
6. The project report contains:
   a) Preparation of the meet
   b) Pre –meet work
   c) Various Committee
   d) Meet works
   e) Ceremony
   f) Post meet work

NME-YOGA FOR WELLNESS

Contact hours per week: 2 Credits : 2
Contact hours per semester: 30 Subject Code : U19PEN61

UNIT – I (6Hours)
Introduction To Wellness- Role of Yoga in Wellness – Yogic Concepts Of wellness.

UNIT – II (6Hours)
Personal Hygiene: Organs Care – Teeth - Hair - Skin - Nose – Nail – Mudra - Shat Kriyas.

UNIT – III (6Hours)
Diseases – Definition – Meaning - Communicable Diseases and Non-communicable diseases.

UNIT – IV (6Hours)
Stress – Meaning And Definition – Management of Techniques Through Yoga Practice.

UNIT – V (6Hours)
Yoga Practice for Life Style Disorders – Hypertension – Diabetes – Obesity – Heart Diseases
.

References:

1. Endrumnalvazvudharum Thirumularin Panniru Yogangal, N.Ramakrishnan, Manivasakar Publication, Chennai, 2003.
2. Sri Patanjali yoga sutra
3. The yoga tradition, George Feuerstein, motialBanarsidass Publishers Pvt. Ltd., Delhi,2002.
4. Science of yoga, I.K.Taimini, Therosophical Publishing House, Adayar, Chennai, 2001.
5. Foundations of Physical Education and Sports (12Ed). D.A.Wuest and C.A.Bucher (1995). St.Louis: Mos by Company
6. Sound Health Through, K.Chandra Sekaran, Prem Kalyan Publications, Madurai, Tamilnadu, India – 1999.
7. Asana Pranyama Mudra Bandha by Swami Saithansansha Saraswathi, yoga publication trust, munget, Bihar, India, Second edition – 1973.

ANNEXURE – II & III

Annexure – II

Internal Evaluation Pattern:

Under Graduate Programmes:

Test	- 10 Marks
ERL (E-Resource Learning)	- 10 Marks
Assignment	- 5 Marks
Total	- 25 Marks

Post Graduate Programmes:

Test	- 20 Marks
ERL (E-Resource Learning)	- 10 Marks
Seminar	- 5 Marks
Assignment	- 5 Marks
Total	- 40 Marks

PG Internal question paper pattern:

Duration of the Internal Test: 2 Hours.

The question paper will have Three Sections.

Section – A Total Marks : **40**

Q.No. 1-6 (4 x 2 = 8 Marks)

Six questions with the open choice of answering any four

Each question carries a maximum of 2 marks

Section – B

Q.No. 7-11 (3 x 4 = 12 Marks)

Five questions with the choice of answering any three

Each question carries a maximum of 4 marks

Section – C

Q.No. 12-15 (2 x 10 = 20 Marks)

Four questions with the choice of answering any two

*Each question carries a maximum of 10 marks

Annexure – III

The question pattern change for the Summative Examinations from November 2021 is given below:

Exam duration reduced to **2 hours for PART I, PART II, PART III and PART IV**. The Pattern of Question paper is changed in UG – Part – I, II, III & IV as follows:

1. For Part – **I, II & III**
    i. The 75 external marks is divided into two categories:
        a) 25 marks for MCQ's online test. (one hour)
        b) 50 marks for Summative Examinations. (two hours)
    ii. For Part I , II & III the pattern is changed as follows:
        a) It consists of two sections instead of the previous three sections.
        b) The Section - A 10 multiple choice questions in the previous question paper pattern is removed.
        c) In the new pattern Section A consists of five either or choice questions **(5 X 4 marks = 20 marks)**
        d) In the new pattern Section B consists of five open choice questions out of which the student has to answer three questions **(3 X 10 marks = 30 marks)**
        e) In both Sections, it is mandatory to ask one question in each unit.
2. For Part – **IV External Question Paper Pattern**
    i. In Part IV question paper (new pattern) Section A consists of seven questions, the student has to answer any five questions. **(5 X 6 marks = 30 marks)**
    ii. Section B consists of five questions out of which the student has to answer three questions. **(3 X 15 marks = 45 marks)**

For PG Private Candidates (for whom external mark is 75) the question paper pattern has Section A & Section B as per the current pattern, except that the Section B questions carries 15 marks instead of 10 marks.

ANNEXURE – IV

DEPARTMENT OF TAMIL

Current equivalent codes and equivalent titles for the following arrear courses (2012 - 2015 batches)

S.No	Course Code	Course Title	Equivalent Code	Equivalent Title	Old Credit	Current Credit
1	U1PT11	இக்கால இலக்கியம்	U3PT1	இக்கால இலக்கியம்	3	3
2	U1PT21	அற இலக்கியமும் காப்பிய இலக்கியமும்	U2PT2	அற இலக்கியமும் காப்பிய இலக்கியமும்	3	3
3	U1PT31	பக்தி இலக்கியமும் சிற்றிலக்கியமும்	U3PT3	பக்தி இலக்கியமும் சிற்றிலக்கியமும்	3	3
4	U1PT41	சங்க இலக்கியம்	U2PT4	சங்க இலக்கியம்	3	3
5	U2PT1	இக்கால இலக்கியம்	U3PT1	இக்கால இலக்கியம்	3	3
6	U2PT3	பக்தி இலக்கியமும் சிற்றிலக்கியமும்	U3PT3	பக்தி இலக்கியமும் சிற்றிலக்கியமும்	3	3
7	U2TAA3	மக்கள் தகவல் தொடர்பியல்	U3TAA3	மக்கள் தகவல் தொடர்பியல்	5	5
8	U1TAC31	பக்தி இலக்கியம்	U2TAC31	பக்தி இலக்கியம்	4	4
9	U2TAC41	காப்பிய இலக்கியம்	U3TAC41	காப்பிய இலக்கியம்	4	4
10	U1TAA4	நாட்டுப்புற இலக்கியங்களும் கோட்பாடுகளும்	U2TAA4	நாட்டுப்புறவியல்	5	5
11	U2TAC51	சிற்றிலக்கியம்	U3TAC51	சிற்றிலக்கியம்	5	5
12	U1TAC54	தமிழ் இலக்கிய வரலாறு	U3TAC54	தமிழ் இலக்கிய வரலாறு	5	5
13	U2TAC54	தமிழ் இலக்கிய வரலாறு	U3TAC54	தமிழ் இலக்கிய வரலாறு	5	5
14	U2TAC61	சங்க இலக்கியம்	U4TAC61	சங்க இலக்கியம்	4	4
15	U3TAC61	சங்க இலக்கியம்	U4TAC61	சங்க இலக்கியம்	4	4
16	U1TAC62	இலக்கியத் திறனாய்வுக் கொள்கைகள்	U2TAC62	இலக்கியத் திறனாய்வுக் கொள்கைகள்	4	4

17	U1TAE61	தமிழகக் கோயிற்கலைகள்	U2TAE61	தமிழகக் கோயிற்கலைகள்	5	5
18	U1TAE62	திரைப்படக் கலையும் விமர்சனமும்	U2TAE62	திரைப்படக் கலையும் விமர்சனமும்	5	5
19	U1TAS61	பேச்சுக்கலை	U2TAS61	பேச்சுக்கலை	2	2
20	U1TAN61	தமிழ் இலக்கிய வரலாறு	U2TAN61	தமிழ் இலக்கிய வரலாறு - 2	2	2

DEPARTMENT OF ENGLISH

S.No	Course Code	Course Title	Equivalent Code	Equivalent Title	Old Credit	Current Credit
1	P2ENC34	Literature Study for NET/SET/JRF	P19ENC34	World Classics in Translation	4	4
2	P2ENC41	Contemporary Literary Theories	P19ENC41	Diaspora Writings	4	4
3	P2ENC42	Teaching of English Language and Literature	P19ENC42	Teaching of English Language and Literature	4	4
4	P2ENC43	Research Methodology	P19ENC43	Research Methodology	4	4
5	P2ENC44	Comparative Literature	P19ENC44	Literature and Gender Studies	4	4
6	P2ENE4	Research Scope in English	P19ENE31	An Introduction to Linguistics	5	5
7	U1ENC61	Indian Diaspora Writing	U3ENC61	SAARC Literature	4	4
8	U1ENE61	English Language Teaching	U3ENE61	Approach to Literary Criticism	5	5
9	U1ENN51	Communication Skills	U2ENN51	English Language Skills (LSRW)	2	2
10	U1ENN61	Spoken English	U3ENN61	Business English	2	2
11	U1PE11	Paper –I Prose, Short Story, Grammar and Composition	U3PE1	English Paper - I	3	3
12	U1PE21	Paper –II Prose, Short Story, Grammar and Composition	U3PE2	English Paper - II	3	3
13	U1PE31	Paper – III Poetry, One-Act Play, Communicative English	U3PE3	English Paper - III	3	3

14	U1PE41	Paper – IV Fiction, Drama and Communicative English	U3PE4	English Paper - IV	3	3
15	U2PE1	Prose, Short Story, Grammar, Composition & Communicative English	U3PE1	English Paper - I	3	3
16	U2PE2	Prose, Short Story, Grammar, Composition & Communicative English	U3PE2	English Paper - II	3	3
17	U2PE3	Poetry, One-Act Play, Grammar, Composition and Communicative English	U3PE3	English Paper - III	3	3
18	U2PE4	Poetry, One-Act Play, Grammar, Composition and Communicative English	U3PE4	English Paper - IV	3	3

DEPARTMENT OF HISTORY

S.No	Course Code	Course Title	Equivalent Code	Equivalent Title	Old Credit	Current Credit
1	U1HSC31	இந்திய வரலாறு கி.பி 1707-1857 வரை	U2HSC31	இந்திய அரசியல் வரலாறு (1526 - 1773 AD)	4	4
2	U1HSS41	இதழியல்	U3HSS41	இந்திய புவியியல் கூறுகள்	2	2
3	U1HSS61	தற்கால அரசியல் சிந்தனைகள்	U2HSS61	தற்கால அரசியல் சிந்தனைகள்	2	2
4	U1HSE62	மனித உரிமைகள்	U3HSE62	பெண்ணியல்	5	5
5	U1HSC32	தமிழக வரலாறு கி.பி. 1529 – 1801 வரை	U2HSC32	அமெரிக்க ஐக்கிய நாடுகளின் வரலாறு (1776 - 1865 வரை)	4	4
6	U1HSA31	சுற்றுலாவின் அடிப்படைக் கொள்கைகள்	U2HSA31	சுற்றுலாவின் அடிப்படைக் கொள்கைகள்	5	5
7	U1HSC22	தமிழக வரலாறு (850 - 1529 AD)	U2HSC22	தமிழக அரசியல் வரலாறு (கி.பி. 1800 - 2006 வரை)	4	4

8	U1HSE51	இந்திய அரசியலமைப்பு வரலாறு (1861 – 1950 AD)	U2HSE51	இந்திய அரசியலமைப்பு வரலாறு (1861 – 1950 AD)	5	5
9	U1HSC41	இந்திய வரலாறு கி.பி. 1857 – 2005 வரை	U2HSC41	இந்திய அரசியல் வரலாறு (கி.பி. 1773 – 1947)	4	4
10	U1HSN51	இந்திய விடுதலை போராட்ட வரலாறு 1885 - 1947 வரை	U2HSN51	நவீன இந்தியாவை உருவாக்கிய சிற்பிகள்	2	2
11	U1HSN61	தற்கால தமிழ் நாட்டு வரலாறு 1916 – 2000 AD	U2HSN61	தற்கால தமிழ்நாட்டு வரலாறு (1916 - 2001 AD)	2	2

DEPARTMENT OF ECONOMICS

S.No	Course Code	Course Title	Equivalent Code	Equivalent Title	Old Credit	Current Credit
1	U1ECC62	Computer Science	U3ECC62	Computer Science	5	5
2	U1ECC42	Mathematical Methods - II	U2ECC42	Mathematical Methods - II	4	4
3	U1ECC21	Micro Economics - II	U3ECC21	Micro Economics - II	4	4
4	U1ECC61	Planninbg and Growth	U3ECC61	Planninbg and Growth	5	5
5	U2ECC21	Micro Economics - II	U3ECC21	Micro Economics - II	4	4
6	U2ECC51	Monetary Economics	U3ECC51	History of Economic Thought	5	5
7	U1ECA1X1	Managerial Economics	U3ECA1X	Managerial Economics	5	5
8	U1ECA2X2	Monetary Economics	U3ECA2X	Monetary Economics	5	5
9	U1ECN61	Population Studies	U3ECN61	Dimensions of Indian Economy	2	2
10	U2ECN61	Perceptives of Indian Economy	U3ECN61	Dimensions of Indian Economy	2	2

DEPARTMENT OF MATHEMATICS

S.No	Course Code	Course Title	Equivalent Code	Equivalent Title	Old Credit	Current Credit
1	U1MAA51	Probability and Statistics	U3MAC62	Statistics	5	5
2	U1MAC41	Dynamics	U3MAA4	Mechanics	4	4
3	U1MAC53	Graph Theory	U2MAC51	Graph Theory and Its Applications	4	4
4	U1MAC62	Complex Analysis	U2MAC61	Complex Analysis	5	5
5	U1MAS41	Transformation Techniques	U3MAS61	Transformation Techniques	2	2
6	U1MAC52	Real Analysis	U3MAC53	Real Analysis	4	4
7	U1MAS62	Random Process	U2MAS62	Random Process	2	2
8	U1MAC12	Theory of Equations and Trigonometry	U3MAC11	Theory of Equations and Trigonometry	4	4
9	U1MAC51	Modern Algebra	U3MAC4	Modern Algebra	4	4
10	U1MAC21	Integral Calculus and Applications	U3MAC21	Integral Calculus	4	4
11	U1MAC22	Analytical Geometry 3D and Vector Calculus	U3MAC22	Analytical Geometry 3D and Vector Calculus	4	4
12	U1MAC31	Differential Equations	U3MAC3	Differential Equations	4	4
13	U1MAN61	Statistics and Operations Research	U2MAN61	Statistics and Operations Research	2	2
14	U1MAA1X1	Allied Mathematics - I	U2MAA1X1	Algebra and Trigonometry	5	5
15	U1MAA2X2	Allied Mathematics - II	U2MAA2X2	Calculus and Matrices	4	4
16	U1MAA3X3	Allied Mathematics - III	U3MAA3X3	Differential Equations and Laplace Transforms	4	4
17	U1MAA4X4	Allied Mathematics - IV	U3MAA4X4	Statistics, Groups and Fourier Series	4	4
18	U2MAA3X3	Differential Equations and Laplace Transform	U3MAA3X3	Differential Equations and Laplace Transforms	4	4
19	U2MAA4X4	Statistics, Groups and Fourier	U3MAA4X4	Statistics, Groups and Fourier Series	4	4

		Series				
20	U1MAA2A	Operations Research	U2MAA3C	Resource Management Techniques	4	4
21	U1MAA1A	Discrete Mathematics	U3MAA1	Discrete Mathematics	4	4
22	U2MAN51	Fundamentals of Arithmetic	U3MAN51	Fundamentals of Mathematics	2	2
23	U1MAA2C	Mathematical Foundations - II	U3MAA2C	Mathematical Foundations - II	4	4
24	U1MAA4C	Numerical Methods	U2MAA4C	Numerical Methods	4	4
25	U3MAA2C	Mathematical Foundations - II	U4MAA2C	Mathematical Foundations - II	4	4
26	U1MAA3B	Business Statistics	U2MAA3B	Business Statistics	5	5
27	P1MAC13	Differential Equations	P19MAC13	Differential Equations	4	4
28	P1MAC25	Optimization Techniques	P19MAC41	Optimization Techniques	4	4
29	P1MAC32	Topology	P19MAC23	Topology	4	4
30	P1MAC34	Number Theory	P19MAC25	Number Theory	4	4
31	P1MAC41	Complex Analysis	P19MAC32	Complex Analysis	4	4
32	P1MAC42	Numerical Analysis	P19MAC33	Numerical Analysis	4	4
33	P1MAC43	Classical Mechanics	P19MAE32	Classical Mechanics	4	4
34	P2MAC33	Functional Analysis	P19MAC42	Functional Analysis	4	4
35	P1MAC11	Abstract Algebra	P19MAC11	Abstract Algebra - I	5	5
36	P1MAC12	Real Analysis	P19MAC12	Real Analysis - I	4	4
37	P1MAC14	Probability and Statistics	P19MAC14	Probability and Statistics	4	4
38	P1MAC21	Advanced Algebra	P19MAC21	Abstract Algebra - II	5	5
39	P1MAC22	Measure and Integration	P19MAC34	Measure Theory	4	4
40	P2MAC23	Topology	P19MAC23	Topology	4	4
41	P2MAC24	Graph Theory	P19MAC24	Advanced Graph Theory	4	4
42	P2MAC25	Number Theory and Cryptography	P19MAC25	Number Theory	4	4
43	P2MAC34	Measure Theory	P19MAC34	Measure Theory	4	4
44	P2MAC44	Combinatories	P19MAC43	Combinatorics	4	4

45	P2MAN2	Industrial Statistics	P19MAN21	Industrial Statistics	4	4

DEPARTMENT OF MATHEMATICS (SF)

S.No	Course Code	Course Title	Equivalent Code	Equivalent Title	Old Credit	Current Credit
1	U1MCS41	Laplace and Fourier Transforms	U3MAS61	Transfomation Techniques	2	2
2	U1MCA31	Visual Programming	U3MAA1N	Mathematical Foundations	4	4
3	U1MCC12	Theory of Equations and Trignometry	U3MAC11	Theory of Equations and Trignometry	4	4
4	U1MCC22	Differential Equations	U3MAC3	Differential Equations	4	4
5	U1MCC31	Analytical Geometry 3D and Vector Calculus	U3MAC22	Analytical Geometry 3D and Vector Calculus	4	4
6	U1MCC41	Dynamics	U3MAA4	Mechanics	4	4
7	U1MCC51	Modern Algebra	U3MAC4	Modern Algebra	4	4
8	U1MCC53	Graph Theory	U2MAC51	Graph Theory and its Applications	4	4
9	U1MCS61	Linux Programming	U3MAS1	Curve Tracing	2	2
10	U1MCC52	Real Analysis	U3MAC53	Real Analysis	4	4
11	U1MCA21	Programming in C	U1NTC2	Programming in C	4	4
12	U1MCC11	Calculus	U3MAC12	Differential Calculus	4	4
13	U1MCC21	Statistics	U3MAC21	Integral Calculus	4	4
14	U1MCS31	Sequences and Series	U2MAS62	Random Process	2	2
15	U1MCN51	Fundamentals of Arithmetic	U3MAN51	Fundamentals of Mathematics	2	2

DEPARTMENT OF PHYSICS

S.No	Course Code	Course Title	Equivalent Code	Equivalent Title	Old Credit	Current Credit
1	U1PHC11	Mechanics and Relativity	U2PHC1	Mechanics and Relativity	4	4
2	U1PHS11	Properties of Matter	U4PHS11	Solar Thermal and Photovoltaic Systems	2	2
3	U1PHC21	Electrostatics and Current Electricity	U3PHC3	Electrostatics and Current Electricity	4	4
4	U1PHS12	Thermal Physics I	U3PHS12	Materials Science	2	2
5	U1PHS21	Sound	U1PHS51	Electrical Wiring	2	2
6	U1PHS22	Thermal Physics II	U1PHS52	Physics of Human Anatomy	2	2
7	U1PHC31	Electromagnetism	U3PHC4	Electromagnetism	4	4
8	U1PHC41	Analog Electronics	U2PHC51	Analog Electronics	4	4
9	U1PHC4P1	Lab: Major Practical - II	U3PHC4P	Lab: General Physics - II	2	2
10	U1PHC51	Classical & Statistical Mechanics	U4PHC63	Classical and Statistical Mechanics	4	4
11	U1PHC52	Digital Electronics	U3PHC62	Digital Electronics	4	4
12	U1PHC62	Materials Science	U3PHC21	Properties of Matter and Sound	4	4
13	U1PHC63	Biophysics	U4PHC63	Classical and Statistical Mechanics	4	4
14	U1PHC6P1	Lab: General Physics	U2PHC6P1	Lab: General Physics	5	5
15	U1PHC6P2	Lab: Electronics	U3PHC6P2	Lab: Electronics	5	5
16	U1PHS61	Astrophysics	U2PHS61	Biomedical Instrumentation	2	2
17	U2PHC63	Biophysics	U4PHC63	Classical and Statistical Mechanics	4	4
18	U2PHC2	Electrostatics and Current Electricity	U3PHC3	Electrostatics and Current Electricity	4	4
19	U2PHS11	Properties of Matter	U4PHS11	Solar Thermal and Photovoltaic Systems	2	2
20	U2PHS12	Thermal Physics I	U3PHS12	Materials Science	2	2

21	U2PHS21	Sound	U1PHS51	Electrical Wiring	2	2
22	U2PHC3	Electromagnetism	U3PHC4	Electromagnetism	4	4
23	U3PHC63	Programming in C	U4PHC63	Classical and Statistical Mechanics	4	4
24	U2PHC4	Analog Electronics	U2PHC51	Analog Electronics	4	4
25	U2PHC62	Materials Science	U3PHC21	Properties of Matter and Sound	4	4
26	U2PHC2P	Lab: General Physics - I	U3PHC2P	Lab: General Physics - I	2	2
27	U2PHC6P2	Lab: Electronics	U3PHC6P2	Lab: Electronics	5	5
28	U2PHC4P	Lab: General Physcis - II	U3PHC4P	Lab: General Physcis - II	2	2
29	P1PHC13	Classical & Statistical Mechanics	P19PHC13	Classical Mechanics	4	4
30	P1PHC22	Electromagnetic Theory	P19PHC22	Electromagnetic Theory	4	4
31	P1PHC31	Solid State Physics I	P19PHC31	Solid State Physics I	4	4
32	P1PHC32	Quantum Mechanics - I	P19PHC23	Quantum Mechanics - I	4	4
33	P1PHC33	Nuclear and Particle Physics	P19PHC33	Nuclear and Particle Physics	4	4
34	P1PHE31	Fiber Optic Communication	P19PHE32	Applied Optics	5	5
35	P1PHC41	Solid State Physics II	P19PHC41	Solid State Physics II	4	4
36	P1PHC42	Molecular Spectroscopy	P19PHC42	Molecular Spectroscopy	4	4
37	P1PHC43	Quantum Mechanics - II	P19PHC32	Quantum Mechanics - II	4	4
38	P1PHE41	Nanophysics	P19PHE41	Nanophysics	5	5
39	P2PHC33	Nuclear and Particle Physics	P19PHC33	Nuclear and Particle Physics	4	4
40	P1PHC11	Mathematical Physics I	P19PHC11	Mathematical Physics I	5	5
41	P1PHC12	Electronics	P19PHC12	Electronics Circuits and Communication	4	4
42	P1PHC21	Mathematical Physics II	P19PHC21	Mathematical Physics II	5	5
43	P1PHE11	Numerical Methods & Programming in C	P19PHE11	Numerical and Statistical Methods	4	4
44	P1PHC1P1	Lab: General Physics	P19PHP11	Lab: General Physics	5	5
45	P2PHC11	Mathematical Physics – I	P19PHC11	Mathematical Physics – I	5	5

46	P2PHC12	Electronics	P19PHC12	Electronics Circuits and Communication	4	4
47	P2PHC22	Electromagnetic Theory	P19PHC22	Electromagnetic Theory	4	4
48	P2PHE41	Nanophysics	P19PHE41	Nanophysics	5	5
49	P1PH4PV	Project & Viva - Voce	P19PH4PV	Project & Viva - Voce	5	5
50	P1PHC3P	Lab: Digital Electronics and General Physics	P19PHP31	Lab: Digital Electronics and General Physics	5	5
51	P2PHC13	Classical Mechanics	P19PHC13	Classical Mechanics	4	4
52	P2PHC21	Mathematical Physics – II	P19PHC21	Mathematical Physics – II	5	5
53	P2PHC23	Thermodynamics & Statistical Mechanics	P19PHC43	Thermodynamics and Statistical Mechanics	4	4
54	U1PHN51	Basic Physics – I	U2PHN51	Basic Physics	2	2
55	U1PHN61	Basic Physics - II	U2PHN61	Solar Energy	2	2

DEPARTMENT OF CHEMISTRY

S.No	Course Code	Course Title	Equivalent Code	Equivalent Title	Old Credit	Current Credit
1	P1CHC12	Inorganic Chemistry - I	P19CHC12	Inorganic Chemistry - I	4	4
2	P1CHC13	Physical Chemistry - I	P19CHC13	Physical Chemistry - I	4	4
3	P1CHC21	Organic Chemistry - II	P19CHC21	Organic Chemistry - II	4	4
4	P1CHC23	Physical Chemistry - II	P19CHC23	Physical Chemistry - II	4	4
5	P1CHC31	Organic Chemistry - III	P19CHC31	Organic Chemistry - III	4	4
6	P1CHC32	Inorganic Chemistry - III	P19CHC32	Inorganic Chemistry - III	4	4
7	P1CHC33	Physical Chemistry - III	P19CHC33	Physical Chemistry - III	4	4
8	P1CHC41	Organic Chemistry - IV	P19CHC41	Organic Chemistry - IV	4	4
9	P1CHC42	Inorganic Chemistry - IV	P19CHC42	Inorganic Chemistry - IV	4	4

10	P1CHC43	Physical Chemistry - IV	P19CHC43	Physical Chemistry - IV	4	4
11	P1CHE31	Medicinal and Pharmaceutical Chemistry	P19CHE31	Medicinal and Pharmaceutical Chemistry	4	4
12	P2CHC11	Organic Chemistry - I	P19CHC11	Organic Chemistry - I	5	5
13	P2CHC12	Inorganic Chemistry - I	P19CHC12	Inorganic Chemistry - I	4	4
14	P2CHC13	Physical Chemistry - I	P19CHC13	Physical Chemistry - I	4	4
15	P2CHC21	Organic Chemistry - II	P19CHC21	Organic Chemistry - II	4	4
16	P2CHC22	Inorganic Chemistry - II	P19CHC22	Inorganic Chemistry - II	5	5
17	P2CHC23	Physical Chemistry - II	P19CHC23	Physical Chemistry - II	4	4
18	P2CHC32	Inorganic Chemistry - III	P19CHC32	Inorganic Chemistry - III	4	4
19	P2CHC34	Analytical Methods in Chemistry	P19CHC34	Analytical Methods in Chemistry	3	3
20	P2CHC42	Inorganic Chemistry - IV	P19CHC42	Inorganic Chemistry - IV	4	4
21	P2CHE11	Nano Science and Nanotechnology	P19CHE11	Nano Science and Nanotechnology	4	4
22	U1CHA1X1	Allied Chemistry - I	U3CHA1X1	General Chemistry - I	4	4
23	U1CHA2PX	LAB : Volumetric Analysis	U2CHA2PX1	LAB : Volumetric Analysis	2	2
24	U1CHA2X2	Allied Chemistry - II	U2CHA2X2	General Chemistry - II	4	4
25	U1CHA3X3	Allied Chemstry - III	U2CHA3X3	General Chemistry - III	4	4
26	U1CHA4PX	LAB : Allied Chemistry	U2CHA4PX	LAB : Organic Qualitative Analysis	2	2
27	U1CHA4X4	Allied Chemistry - IV	U2CHA4X4	General Chemistry - IV	4	4
28	U1CHC21	General Chemistry	U3CHC2	General Chemistry	4	4
29	U1CHC31	Inorganic and Physical Chemistry	U3CHC3	Inorganic and Physical Chemistry	4	4
30	U1CHC41	Organic and Physical Chemistry	U3CHC4	Organic and Physical Chemistry	4	4
31	U1CHC51	Organic Chemistry – I	U3CHC51	Organic Chemistry – I	4	4
32	U1CHC52	Physical Chemistry - I	U3CHC52	Physical Chemistry - I	4	4
33	U1CHC53	Inorganic Chemistry - I	U3CHC53	Inorganic Chemistry - I	4	4
34	U1CHC61	Organic Chemistry - II	U2CHC61	Organic Chemistry - II	4	4

35	U1CHC62	Physical Chemistry - II	U3CHC62	Physical Chemistry - II	4	4
36	U1CHC63	Inorganic Chemistry - II	U3CHC63	Inorganic Chemistry - II	4	4
37	U1CHN51	Polymer Chemistry	U3CHN51	Chemistry in day-to-day life	2	2
38	U1CHN61	Industrial Chemistry	U2CHN61	Industrial Chemistry	2	2
39	U1CHS61	Medicinal Laboratory Technology and Clinical Biochemistry	U1CHS61	Medicinal Laboratory Technology and Clinical Biochemistry	2	2
40	U2CHA1Y	General Chemistry - I	U3CHA1Y	General Chemistry - I	4	4
41	U2CHA2Y	General Chemistry - II	U3CHA2Y	General Chemistry - II	4	4
42	U2CHA3X1	General Chemistry - I	U3CHA3X1	General Chemistry - I	4	4
43	U2CHA6X4	General Chemistry - IV	U3CHA6X4	General Chemistry - IV	4	4
44	U2CHC1	Introduction to Chemistry	U3CHC1	Introduction to Chemistry	4	4
45	U2CHC2	General Chemistry	U3CHC2	General Chemistry	4	4
46	U2CHC3	Inorganic and Physical Chemistry	U3CHC3	Inorganic and Physical Chemistry	4	4
47	U2CHC4	Organic and Physical Chemistry	U3CHC4	Organic and Physical Chemistry	4	4
48	U2CHC51	Organic Chemistry – I	U3CHC51	Organic Chemistry – I	4	4
49	U2CHC52	Physical Chemistry – I	U3CHC52	Physical Chemistry – I	4	4
50	U2CHC53	Inorganic Chemistry – I	U3CHC53	Inorganic Chemistry – I	4	4
51	U2CHC63	Inorganic Chemistry – II	U3CHC63	Inorganic Chemistry – II	4	4
52	U2CHN51	Chemistry in day-to-day life	U3CHN51	Chemistry in day-to-day life	2	2

DEPARTMENT OF BOTANY

S.No	Course Code	Course Title	Equivalent Code	Equivalent Title	Old Credit	Current Credit
1	U1BYS11	Horticulture	U2BYS11	Horticulture	2	2
2	U1BYS12	Embryology of Angiosperms	U2BYS12	Embryology of Angiosperms	2	2

3	U1BYC21	Algae and Bryophytes	U3BYC1	Algae and Bryophytes	4	4
4	U1BYS21	Phytogeography	U2BYS21	Plant Ecology and Phytogeography	2	2
5	U1BYC31	Plant Pathology	U3BYC3	Fungi, Lichens and Plant Pathology	4	4
6	U1BYC41	Pteridophytes & Gymnosperms	U2BYC4	Pteridophytes and Gymnosperms	4	4
7	U1BYC51	Biochemistry	U3BYC51	Biochemistry and Biotechniques	5	5
8	U1BYC52	Genetics & Evolution	U3BYC52	Genetics and Plant Breeding	5	5
9	U1BYC53	Taxonomy of Angiosperms	U3BYC53	Taxonomy of Angiosperms	4	4
10	U1BYC61	Plant Physiology	U3BYC61	Plant Physiology	5	5
11	U2BYC52	Genetics and Plant Breeding	U3BYC52	Genetics and Plant Breeding	5	5
12	U2BYC53	Taxonomy of Angiosperms	U3BYC53	Taxonomy of Angiosperms	4	4
13	U2BYC3	Fungi, Lichens and Plant Pathology	U3BYC3	Fungi, Lichens and Plant Pathology	4	4
14	P1BYC12	Cell Biology and Internal Morphology	P19BYC12	Cell Biology and Internal Morphology	4	4
15	P1BYC13	Instrumentation and Biotechniques	P19BYC13	Entreprenuer Botany	4	4
16	P1BYE11	Pharmacognosy	P19BYE11	Pharmacognosy	5	5
17	P1BYC21	Algae,Lichens,Bryophytes and Pteridophytes	P19BYC21	Algae,Lichens,Bryophytes and Pteridophytes	4	4
18	P1BYC22	Genetics and Molecular Biology	P19BYC22	Genetics and Molecular Biology	4	4
19	P1BYC32	Biotechnology	P19BYC32	Biotechnology	4	4
20	P1BYC33	Biochemistry	P19BYC33	Biochemistry	4	4
21	P1BYE31	Biodiversity & Conservation	P19BYE31	Biodiversity and Conservation	5	5
22	P1BYC41	Plant Physiology	P19BYC41	Plant Physiology	4	4
23	P1BYC42	Bioinformatics and Biostatistics	P19BYC42	Bioinformatics and Biostatistics	4	4
24	P1BYC31	Microbiology, Fungi and Plant Pathology	P19BYC31	Microbiology, Fungi and Plant Pathology	4	4
25	P1BYC43	Developmental Botany	P19BYC43	Developmental Botany	4	4

26	P1BYE3	Biodiversity & Conservation	P19BYE31	Biodiversity and Conservation	5	5

DEPARTMENT OF ZOOLOGY

S.No	Course Code	Course Title	Equivalent Code	Equivalent Title	Old Credit	Current Credit
1	U1ZYC41	Cell Biology	U3ZYC3	Cell Biology	4	4
2	U1ZYC61	Ecology	U3ZYC61	Ecology and Evolution	5	5
3	U1ZYC11	Invertebrata	U3ZYC1	Invertebrata	4	4
4	U1ZYA41	Sericulture – II	U3ZYA4	Sericulture – II	4	4
5	U1ZYC51	Animal Physiology	U3ZYC51	Animal Physiology	5	5
6	U1ZYC53	Microbiology and Immunology	U3ZYC53	Microbiology and Immunology	4	4
7	U1ZYA51	Mulberry Silkworm Rearing and Silkworm Genetics	U3ZYA51	Sericulture - III	4	4
8	U1ZYC6P1	Lab: Animal Physiology and Genetics	U3ZYC6P1	Lab: Animal Physiology, Genetics and Biostatistics	2	2
9	U1ZYC6P2	Lab: Ecology and Biochemistry	U3ZYC6P2	Lab: Ecology, Evolution and Biochemistry	2	2
10	U1ZYA61	Silk Reeling Technology	U2ZYA61	Sericulture - IV	4	4
11	U1ZYA6P	Lab: Mulbery Silkworm Rearing and Genetics of Silkworm	U3ZYA6P	Lab: Sericulture III and IV	2	2
12	U1ZYC21	Chordata	U3ZYC2	Chordata	4	4
13	U1ZYS21	Biostatistics	U3ZYS21	Animal Diversity and Adaptations - II	2	2
14	U1ZYS11	Economic Entomology	U3ZYS22	Applied Zoology - II	2	2
15	U1ZYC62	Biochemistry	U3ZYC62	Biochemistry	5	5
16	U1ZYC31	Developmental Biology	U3ZYC4	Developmental Biology	4	4

17	U1ZYS22	Computer Applications and Information Technology	U3ZYS22	Applied Zoology - II	2	2
18	U1ZYS12	Fisheries Biology	U3ZYS12	Applied Zoology - I	2	2
19	U1ZYC52	Genetics	U3ZYC52	Genetics and Biostatistics	5	5
20	U1ZYC2P1	Lab: Invertebrata & Chordata	U3ZYC2P	Lab: Invertebrata & Chordata	2	2
21	U2ZYS11	Computer Applications and Information Technology	U3ZYS11	Animal Diversity and Adaptations - I	2	2
22	U2ZYS12	Applied Zoology - I	U3ZYS12	Applied Zoology - I	2	2
23	U2ZYC51	Animal Physiology	U3ZYC51	Animal Physiology	5	5
24	U2ZYC52	Genetics	U3ZYC52	Genetics and Biostatistics	5	5
25	U2ZYC53	Microbiology and Immunology	U3ZYC53	Microbiology and Immunology	4	4
26	U2ZYC62	Biochemistry	U3ZYC62	Biochemistry	5	5
27	U2ZYA51	Mulberry Silkworm Rearing and Silkworm Genetics	U3ZYA51	Sericulture - III	4	4
28	U2ZYC4	Developmental Biology	U3ZYC4	Developmental Biology	4	4
29	U2ZYC3	Cell Biology	U3ZYC3	Cell Biology	4	4
30	U2ZYS21	Biostatistics	U3ZYS21	Animal Diversity and Adaptations - II	2	2
31	U2ZYA4	Sericulture – II	U3ZYA4	Sericulture – II	4	4
32	P1ZYC11	Cell and Molecular Biology	P19ZYC11	Cell and Molecular Biology	4	4
33	P1ZYC31	Immunology	P19ZYC31	Immunology	4	4
34	P1ZYC32	Microbiology	P19ZYC41	Microbiology	4	4
35	P1ZYC41	Developmental Biology	P19ZYC32	Developmental Biology	4	4
36	P1ZYC42	Animal Physiology	P19ZYC42	Animal Physiology	4	4
37	P1ZYC43	Biotechnology	P19ZYC43	Biotechnology	4	4
38	P1ZYC21	Molecular Genetics	P19ZYC21	Molecular Genetics	4	4
39	P1ZYC22	Ecology	P19ZYC22	Ecology	4	4
40	P1ZYC2P1	Lab: Genetics	P19ZYP21	Lab: Molecular Genetics	3	3

41	P1ZYC13	Biophysics	P19ZYC12	Biochemistry and Biophysics	4	4
42	P1ZYE11	Techniques in Biology	P19ZYC13	Techniques in Biology	4	4
43	P2ZYC13	Biophysics	P19ZYC12	Biochemistry and Biophysics	4	4
44	P2ZYE1	Techniques in Biology	P19ZYC13	Techniques in Biology	4	4
45	P2ZYC22	Ecology	P19ZYC22	Ecology	4	4
46	P2ZYC23	Biostatistics and Bioinformatics	P19ZYC23	Biostatistics and Bioinformatics	4	4
47	P2ZYC33	Evolution	P19ZYC33	Evolution	4	4
48	U1ZYA3X1	Allied Zoology – I	U3ZYA3X1	Invertebrata	4	4
49	U1ZYA4X2	Allied Zoology – II	U3ZYA4X2	Chordata	4	4
50	U1ZYA5X3	Allied Zoology – III	U3ZYA5X3	Cell Biology, Developmental Biology, Physiology, Immunology and Evolution	4	4
51	U1ZYA6X4	Commercial Zoology (Vermiculture, Apiculture, Aquaculture and Poultry Science and Dairy Farming)	U3ZYA6X4	Commercial Zoology (Vermiculture, Apiculture, Aquaculture and Poultry Science and Dairy Farming)	4	4
52	U1ZYN51	Ornamental Fish Culture	U3ZYN51	Ornamental Fish Culture	2	2
53	U2ZYA3X1	Invertebrata	U3ZYA3X1	Invertebrata	4	4
54	U2ZYA4X2	Chordata	U3ZYA4X2	Chordata	4	4
55	U2ZYA5X3	Cell Biology, Developmental Biology, Physiology, Immunology and Evolution	U3ZYA5X3	Cell Biology, Developmental Biology, Physiology, Immunology and Evolution	4	4
56	U2ZYA6X4	Commercial Zoology (Vermiculture, Apiculture, Aquaculture and Poultry Science and Dairy Farming)	U3ZYA6X4	Commercial Zoology (Vermiculture, Apiculture, Aquaculture and Poultry Science and Dairy Farming)	4	4
57	U2ZYN61	Human Biology	U3ZYN61	Human Biology	2	2
58	U2ZYN51	Ornamental Fish Culture	U3ZYN51	Ornamental Fish Culture	2	2

DEPARTMENT OF MICROBIOLOGY

S.No	Course Code	Course Title	Equivalent Code	Equivalent Title	Old Credit	Current Credit
1	U1MBA31	Biology - Plant Science	U2MBA3	Biology - Plant Science	4	4
2	U1MBA51	Biology - Cell Biology	U3MBA51	Introduction to Pharmacognosy	4	4
3	U1MBC62	Food and Industrial Microbiology	U3MBC62	Food and Industrial Microbiology	4	4
4	U1MBA41	Biology - Animal Physiology	U3MBA4	Biology - Animal Science	4	4
5	U1MBC53	Medical Microbiology	U2MBC53	Medical Microbiology	4	4
6	U1MBC63	Bioinformatics	U3MBC63	Research Methodology and Bioinformatics	4	4
7	U1MBS62	Pharmaceutical Microbiology	U3MBS1	Basic Techniques in Microbiology	2	2
8	U2MBA4	Biology - Animal Physiology	U3MBA4	Biology - Animal Science	4	4
9	U2MBA51	Cell Biology	U3MBA51	Introduction to Pharmacognosy	4	4
10	U2MBA61	Applied Ecology	U3MBA61	Basic Concept of Pharmacology	4	4
11	U2MBC62	Food and Industrial Microbiology	U3MBC62	Food and Industrial Microbiology	4	4
12	U2MBC6P	LAB: Recombinant DNA Technology, Food and Industrial Microbiology	U3MBC6P	LAB: Recombinant DNA Technology, Food and Industrial Microbiology	4	4
13	U2MBC4	Microbial Biochemistry	U3MBC4	Microbial Biochemistry	4	4
14	U2MBS2	Principles of Biochemical Techniques	U3MBS2	Principles of Biochemical Techniques	2	2
15	U2MBC2	Microbial Physiology	U3MBC2	Microbial Physiology	5	5
16	U2MBC61	Recombinant DNA (rDNA) Technology	U3MBC61	Recombinant DNA (rDNA) Technology	4	4
17	U2MBC63	Bioinformatics	U3MBC63	Research Methodology and Bioinformatics	4	4
18	U1MBN61	Human Diseases and Diagnostic Microbiology	U4MBN61	Applied Microbiology	2	2
19	U2MBN61	Human Diseases and Diagnostic	U4MBN61	Applied Microbiology	2	2

		Microbiology				
20	U2MBN51	Entrepreneurship in Microbiology	U3MBN51	Introduction to Microbiology	2	2

DEPARTMENT OF COMPUTER SCIENCE

S.No	Course Code	Course Title	Equivalent Code	Equivalent Title	Old Credit	Current Credit
1	U1CSC41	Advanced JAVA Technology	U3CSC41	Advanced Java Programming	4	4
2	U1CSC42	Computer Graphics	U2CSC62	Computer Graphics and Digital Image Processing	4	4
3	U1CSC51	Software Engineering	U2CSC61	Software Engineering	4	4
4	U1CSC6P	Lab: Computer Animation	U2CSC6P2	Android Programming	3	3
5	U2CSC31	Java Programming	U3CSC31	Java Programming	4	4
6	U2CSC41	Advanced Java Programming	U3CSC41	Advanced Java Programming	4	4
7	U1CSC11	Programming in C	U2CSC11	Programming in C	4	4
8	U2CSC4P	Lab: Programming in Advanced Java	U3CSC4P	Programming in Advanced Java	4	4
9	U2CSC5P2	Lab: Dot Net Programming	U3CAC6P1	Lab: Dot Net Programming	3	3
10	U2CSN51	Computer Fundamentals	U3CAN51	Basics of Computer	2	2
11	P1CSC3P1	Lab: Software Developments	P1CSC3P1	Lab: Software Developments	3	3
12	P1CSC41	Soft Computing	P1CSC41	Soft Computing	4	4
13	P1CSC42	Data Mining and Warehousing	P1CSC42	Data Mining and Warehousing	4	4

DEPARTMENT OF INFORMATION TECHNOLOGY

S.No	Course Code	Course Title	Equivalent Code	Equivalent Title	Old Credit	Current Credit
1	U1NTC31	Data Structures	U2NTC31	Data Structures	4	4
2	U1NTC62	Mobile Communication	U3NTC63	Data Science	4	4
3	U1NTS61	Computer Graphics	U3NTS61	Open Source Programming	2	2
4	U1NTC51	Java Programming	U2NTC32	Java Programming	4	4
5	U1NTC5P1	Lab: Java Programming	U3NTC3P2	Lab: Programming in Java	3	3
6	U1NTC41	Database Management Systems	U3NTC51	Relational Database Management Systems	4	4
7	U1NTC32	Object Oriented Programming With C++	U3NTC41	Python Programming	4	4
8	U1NTS11	Digital Principles and applications	U2NTS1	Introduction to HTML	2	2
9	U1NTS51	Web Technology	U3NTS51	Android Programming	2	2
10	U1NTC4P1	Lab: Client Server	U3NTC4P	Lab : Python Programming	3	3
11	U1NTC6P	Lab: Dot Net	U3NTS6P1	Lab: Dot Net Programming	3	3
12	U1NTS6P	Lab: Linux Programming	U3NTS6P2	Lab: Open Source Programming	2	2
13	U1NTE51	Data Communications and Networks	U3NTE51	Data Communication and Networks	5	5
14	U2NTE51	Data Communication and Networks	U3NTE51	Data Communication and Networks	5	5
15	U2NTC51	Dot Net Programming	U3NTC62	Dot Net Programming	4	4
16	U2NTC5P1	Lab: Dot Net Programming	U3NTS6P1	Lab: Dot Net Programming	3	3
17	U2NTC5P2	Lab: Web Programming	U3NTC5P2	Lab: Web Programming	3	3
18	U2NTS51	Web Technology	U3NTS51	Android Programming	2	2
19	U2NTC41	Java Programming	U2NTC32	Java Programming	4	4
20	U2NTC4P	Lab: Programming in Java	U3NTC3P2	Lab: Programming in Java	3	3

21	U2NTC61	Relational Database Management Systems	U3NTC51	Relational Database Management Systems	4	4
22	U2NTC62	Mobile Communication	U2CSE52	Computer Networks	5	5
23	U2NTC63	Computer Graphics	U3CSC62	Computer Graphics and Digital Image Processing	4	4
24	U2NTS6P1	Lab: Linux Programming	U3NTS6P2	Lab : Open Source Programming	2	2
25	U2NTS61	Cloud Computing	U3CAS61	Internet of Things	2	2
26	U1NTN51	Fundamentals of Database Systems	U3NTN51	Introduction to Information Technology	2	2
27	U1NTN61	Multimedia	U2NTN61	Introduction to Internet	2	2

DEPARTMENT OF COMPUTER APPLICATION

S.No	Course Code	Course Title	Equivalent Code	Equivalent Title	Old Credit	Current Credit
1	U1CAC21	Object Oriented Programming with C++	U3NTC41	Python Programming	4	4
2	U1CAC31	Java Programming	U2CAC31	Java Programming	4	4
3	U1CAC41	Database Management System	U3CAC41	Relational Database Management System	4	4
4	U1CAC42	Software Engineering	U2CSC61	Software Engineering	4	4
5	U1CAC43	Operating System	U3CAC51	Operating System	4	4
6	U1CAE56	Cloud Computing	U2CAE63	Cloud Computing	5	5
7	U1CAC61	Computer Graphics	U3CSC62	Computer Graphics and Digital Image Processing	4	4
8	U2CAC51	Relational Database Management System	U3CAC41	Relational Database Management System	4	4

9	U2CAC5P1	Lab: RDBMS	U3NTC4P	Lab: Python Programming	3	3
10	U2CAC5P2	Lab: Web Technology	U3NTC5P2	Lab: Web Programming	3	3
11	U2CAE51	Web Technology	U3CAE51	Web Technology	5	5
12	U2CAN51	Fundamentals of Information Technology	U3CAN51	Basics of Computer	2	2
13	U1CAN62	Cryptography	U3CAS61	Internet of Things	2	2

DEPARTMENT OF COMMERCE

S.No	Course Code	Course Title	Equivalent Code	Equivalent Title	Old Credit	Current Credit
1	U1CMA31	Business Statistics	U3CMA3	Business Statistics	5	5
2	U1CMA41	Business Mathematics	U3CMA4	Business Mathematics	5	5
3	U1CMC11	Financial Accounting – I	U3CMC11	Financial Accounting – I	4	4
4	U1CMC21	Financial Accounting – II	U3CMC21	Financial Accounting – II	4	4
5	U1CMC33	Salesmanship	U2CMC33	Salesmanship	4	4
6	U1CMC41	Cost Accounting	U3CMC41	Cost Accounting	4	4
7	U1CMC42	Company Organization	U3CMC42	Company Organization	4	4
8	U1CMC43	Advertising	U2CMC43	Advertising	4	4
9	U1CMC44	Financial Accounting – IV	U3CMC44	Partnership Accounting	4	4
10	U1CMC51	Financial Accounting – V	U3CMC51	Corporate Accounting	4	4
11	U1CMC52	Financial Markets and Services	U3CMC52	Financial Markets and Services	4	4
12	U1CMC54	Business Law	U3CMC54	Business Law	4	4
13	U1CMC61	Management Accounting	U3CMC63	Special Accounts	4	4
14	U1CMC62	Business Environment	U3CMC53	Business Environment	4	4
15	U1CMC63	Industrial Law	U3CMC62	Entrepreneurship Development	4	4
16	U1CME51	Income Tax	U3CME51	Income Tax	5	5
17	U1CMS41	MS-Office	U3CMS3	Soft Skill for Business	2	2
18	U1CMS4P1	MS-Office	U3CMS4P	Office Data Processing Skills	2	2

19	U1CMS61	Tally	U3CMS4	Electronic Business Skills	2	2
20	U1CMS6P	Tally	U3CMS6P	Business Accounting Software	2	2
21	U1CMN61	Insurance	U3CMN61	Principles of Marketing	2	2
22	U2CMC42	Company Organization	U3CMC42	Company Organization	4	4
23	U2CMC51	Financial Accounting – V	U3CMC51	Corporate Accounting	4	4
24	U2CMC61	Management Accounting	U3CMC61	Management Accounting	5	5
25	U2CMC62	Business Environment	U3CMC53	Business Environment	4	4
26	U2CMS3	Fundamentals of Computers	U3CMS3	Soft Skill for Business	2	2
27	U2CMS61	Tally	U3CMS4	Electronic Business Skills	2	2
28	P1CMC11	Business Statistics	P19CMC11	Business Statistics	5	5
29	P1CMC22	Human Resource Management	P19CMC22	Human Resource Management	4	4
30	P1CMC24	Advanced Financial Accounting	P19CMC24	Advanced Financial Accounting	4	4
31	P1CMC25	Investment Management	P19CMC25	Investment Management	4	4
32	P1CMC34	Strategic Management	P19CMC34	Strategic Management	4	4
33	P1CMC41	Financial Management	P19CMC41	Financial Management	4	4
34	P1CMC43	Entrepreneurship Development	P19CMC43	Business Ethics Corporate Governance	4	4
35	P1CMC44	Indirect Tax – II	P1CMC44	Indirect Tax – II	4	4
36	P1CME11	Advanced Cost Accounting	P19CME11	Advanced Cost Accounting	5	5
37	P1CME31	Corporate Accounting	P19CME31	Corporate Accounting	5	5
38	P1CME4	Accounting Standards & Corporate Reporting	P19CME41	Indian Accounting Standards & Corporate Reporting	5	5
39	P2CMC11	Business Statistics	P19CMC11	Business Statistics	5	5
40	P2CMC12	Modern Banking	P19CMC12	Banking Technology	4	4
41	P2CMC14	Business Management	P19CMC14	Business Management	4	4
42	P2CMC21	Operations Research	P19CMC21	Operations Research	5	5
43	P2CMC42	Direct Taxes – II	P19CMC42	Direct Taxes – II	4	4
44	P2CME3	Corporate Accounting	P19CME31	Corporate Accounting	5	5

DEPARTMENT OF COMMERCE (CA)

S.No	Course Code	Course Title	Equivalent Code	Equivalent Title	Old Credit	Current Credit
1	U1CCA11	Fundamentals of Computers	U2CCA1	Fundamentals of Computers	5	5
2	U1CCA21	C Programming	U2CCA2	C Programming	5	5
3	U1CCA31	Business Statistics	U3CCA3	Business Statistics	5	5
4	U1CCC11	Financial Accounting – I	U3CCC1	Financial Accounting – I	4	4
5	U1CCC21	Financial Accounting – II	U3CCC2	Financial Accounting – II	4	4
6	U1CCC31	Financial Accounting – III	U3CCC31	Advanced Accounting	4	4
7	U1CCC32	Business Correspondence	U2CMC33	Salesmanship	4	4
8	U1CCC41	Cost Accounting	U3CCC41	Cost Accounting	4	4
9	U1CCC42	Visual Programming	U3CCC42	Visual Programming	5	5
10	U1CCC43	Financial Accounting – IV	U3CCC43	Partnership Accounting	4	4
11	U1CCC51	Financial Accounting – V	U3CCC51	Corporate Accounting	5	5
12	U1CCC52	Java Programming	U3CME3	Auditing	5	5
13	U1CCC53	Business Law	U3CCC53	Business Law	4	4
14	U1CCC61	Management Accounting	U3CMC62	Entrepreneurship Development	4	4
15	U1CCC62	Internet and Web Technologies	U2CCC62	Internet and Web Technologies	4	4
16	U1CCE51	Income Tax	U3CCE51	Income Tax	5	5
17	U1CCS41	MS-Office	U3CMS3	Soft Skill for Business	2	2
18	U1CCS61	Tally	U3CCS4	Electronic Business Skills	2	2
19	U2CCC1	Financial Accounting – I	U3CCC1	Financial Accounting – I	4	4

20	U2CCC43	Financial Accounting – IV	U3CCC43	Partnership Accounting	4	4
21	U2CCC51	Financial Accounting – V	U3CCC51	Corporate Accounting	5	5
22	U2CCC61	Management Accounting	U3CCC61	Management Accounting	5	5
23	U2CCC62	Internet and Web Technologies	U2CCC62	Internet and Web Technologies	4	4
24	U2CCC63	Industrial Law	U3CCC63	Special Accounts	4	4
25	U2CCS61	Tally	U3CCS4	Electronic Business Skills	2	2
26	U2CCS6P	Tally	U3CCS6P	Business Accounting Software	2	2
27	P1CCC11	Advanced Accounts	P21CCC32	Corporate Accounting	5	5
28	P1CCC12	International Trade	P21CCE11	Banking Technology	4	4
29	P1CCC13	Data Base Management System	P19CMC23	Management Information System	4	4
30	P1CCC21	Advanced Cost Accounting	P21CCC12	Advanced Cost Accounting	5	5
31	P1CCC22	Advanced Business Statistics	P21CCC11	Business Statistics	5	5
32	P1CCC23	Object Oriented Programming with C++	P21CCC23	Computerized Accounting	4	4
33	P1CCC32	Direct Tax	P21CCC31	Direct Taxes	5	5
34	P1CCC41	Financial Management	P21CCC41	Financial Management	5	5
35	P1CCC43	System Analysis and Design	P21CCC43	Web Design	4	4
36	P1CCE31	Security Analysis and Portfolio Management	P21CCE21	Investment Management	5	5

DEPARTMENT OF E-COMMERCE

S.No	Course Code	Course Title	Equivalent Code	Equivalent Title	Old Credit	Current Credit
1	U1CEC11	Pc Software and HTML	U2CCA1	Fundamentals of Computes	5	5
2	U1CEC33	Data Base Management Systems	U2CCC52	Java Programming	4	4
3	U1CEC41	Business Mathematics	U3CCA4	Business Mathematics	5	5
4	U1CEC44	Object Oriented Programming (C++ & Java)	U2CCC62	Internet and Web Technology	4	4
5	U1CES42	International Business	U3CMS3	Soft Skill for Business	2	2
6	U1CEC53	Financial Accounting – V	U3CCC63	Special Accounts	4	
7	U1CEE51	Income Tax – I	U3CCE51	Income Tax	5	5
8	U1CEC61	Financial Accounting – VI	U3CMC53	Business Environment	4	4
9	U1CEC62	Software Engineering	U3CMC62	Entrepreneurship Development	4	4
10	U1CEE61	Income Tax – II	U3CME3	Auditing	5	5
11	U1CES61	Introduction to PHP	U3CCS4	Electronic Business Skills	2	2

DEPARTMENT OF BUSINESS ADMINISTRATION

S.No	Course Code	Course Title	Equivalent Code	Equivalent Title	Old Credit	Current Credit
1	U1BA6PV	Field Study Report	U2BA6PR	Project Report	5	5
2	U1BAC21	Business Environment	U3BAC21	Business Environment	4	4
3	U1BAC61	Financial Management	U2BAC61	Financial Management	4	4
4	U1BAC62	Services Marketing	U2BAC62	Services Marketing	4	4

5	U1BAC63	Human Resource Management	U2BAC63	Human Resource Management	4	4
6	U1BAS61	Elements of Tally	U2BAS61	Soft Skills	2	2
7	U1BAS6P	Tally	U2BAS62	Personality Development	2	2
8	U2BAC53	Management Accounting	U3BAC53	Management Accounting	4	4

DEPARTMENT OF MANAGEMENT STUDIES

S.No	Course Code	Course Title	Equivalent Code	Equivalent Title	Old Credit	Current Credit
1	P1MSC11	Business Statistics	P19MSC12	Business Statistics	4	4
2	P1MSC24	Human Resources Management	P19MSC23	Human Resources Management	4	4
3	P1MSC25	Financial Management	P19MSC22	Financial Management	4	4

DEPARTMENT OF NCC

S.No	Course Code	Course Title	Equivalent Code	Equivalent Title	Old Credit	Current Credit
1	U1NCN61	National Cadet Corps - Paper II	U2NCN61	National Cadet Corps - Paper II	2	2