**Course Name : Master of Science**
**Discipline : Computer Applications**
**(For those who join in 2015 and after)**

**Self Learning Courses:**

| Subject | Credit | Ext =Tot | Subject Code |
|---|---|---|---|
| Software Testing | 5 | 100 = 100 | P1CASL1 |
| XML | 5 | 100 = 100 | P1CASL2 |

## Software Testing

**Subject Code : P1CASL1**

**Total Marks 100** **Credit: 5**

**Objectives:**

- To learn about the purpose and levels of software testing.
- To learn about the different types of testing.
- To identify the bugs and failures in the software.
- To find ways to solve the bugs and failures in the software.
- To implement the various testing methods in the software.

**Unit I**

**Introduction**: Software Structure and Software Testing – Purpose of testing – A model for testing.

**Testing and Levels**:- Testing levels – Unit Testing – Component Testing – Integration Testing – System Testing – Interoperability Testing – Performance Testing – Regression Testing – Acceptance Testing – Pilot or Field Testing – Installation or Product Testing.

**Unit II**

**The Taxonomy of Bugs:-** Mistakes, Bugs and Failures – A Taxonomy of Bugs – Consequences of Bugs.

**Flow Graphs and Path Testing**:- Path Testing Basics – Steps in Path Testing – Construct Control Flow Graph – Arrive at Test Paths – Providing Appropriate Inputs – Path Sensitizing – Path Instrumentation – Application of Path Testing – Effectiveness of Path Testing.

**Unit III**

**Transaction Flow Testing**:- Control Flow Chart and Structure, Data and Transaction Testing – Software Functionality and Transactions – Transaction Flow Structure – Transaction flow Testing Techniques.

**Data Flow Testing**:- Basics of data flow testing – Data Flow graphs and their representation – Data Object state and Usage – Data flow Anomalies – States of Data Objects and Data Flow Anomalous State Graph – Static Versus Anomaly Detection – Data Flow graph Testing Techniques – Strategies for Data flow Testing – Test Strategies – Application of Data Flow Testing.

**Unit IV**

**Domain Testing**:- Domains and Paths – Concepts of Domain, Open and Closed Domains – Nice Domains and Ugly Domains – Domain Testing – Domains and Interface Testing – Domains and Testability.

**Paths, Path Products and Regular Expression**:- Concepts of Path and Path Expressions – A Path Reduction Procedure – Applications – Regular Expression and flow Anomaly Detection.

**Unit V**

**States, State Graphs and Transition Testing**:- Object oriented systems and State Graphs – State Graph – General Properties of State Graphs – Good State Graph and Bad State Graphs – Bugs in State Graphs – The Role of State Graphs in Software Testing – Test Design Strategies for State Graph based Testing – Test Design Strategies for State Graph based Testing – State Graph based Test Design – An Example for Creating State Graph and Designing Test Cases – Testability Tips.

**Graph Matrices and Applications:-** Path Tracing Issues in Graph and Matrix Representation – Graph and the Matrix of a Graph – Terminology: The Matrix of a Graph – Examples on Matrix Representations – Cyclomatic Complexity – Graphs, Relations and Properties of Relations – The Powers of Matrix – Node Reduction Algorithm – Matrix Reduction Method.

**Text Book:**

Software Testing Techniques and Applications, Arunkumar Khannur, Pearson Education, First Impression 2011.

Unit I: Chapters 1 (1.1, 1.2, 1.4), 2
Unit II: Chapters 3, 4
Unit III: Chapters 5, 6
Unit IV: Chapters 7, 8
Unit V: Chapters 10, 11

**Reference Book:**

1. Software Quality and Testing – A Concise Study, S.A.Kelkar, PHI Learning Private Limited, 2012

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## XML

**Subject Code : P1CASL2**

**Total Marks 100** **Credit: 5**

**Objectives:**

- Able to get an idea about XML.
- Able to know about XML Processing and Validation.
- To Creating and Processing XML Documents.

**Unit I**

**XML:** Of Data, Files, and Text- So What is XML - Origin of the XML -Where XML can be used, and what you can use it for.

**Well Formed XML:** Parsing XML – Tags and Text and Elements, oh My- Attributes- Empty elements – XML Declarations- Processing Instructions – Illegal PCDATA Characters- Errors in XML.

**Unit II**

**XML Namespaces:** Why we need Namespaces- How XML Namespaces Work- Understanding URIs- When to Use Namespaces.

**Document Type Definitions:** Running the Samples- Sharing Vocabularies – Anatomy of a DTD- Developing DTDs – DTD Limitations.

**Unit III**

**XML Schemas:** Benefits of XML Schemas- Do We Still Need DTDs? – XML Schemas- Creating a Schema from Multiple Documents- Documenting XML Schemas.

**RELAX NG:** XML and Compact Syntaxes- RELAX NG Patterns- Combining and Reusing Patterns and Grammars.

**Unit IV**

**XSLT:** What is XSLT- How an XSLT Processor Works – Running the Examples – Procedural Vs Declarative Programming – Foundational XSLT Elements – Getting Information from the Source Tree – Introducing the output with the <xsl:output> Element – Conditional Processing – The <xsl:for-each> element – The <xsl:sort> Element – XSLT Models – XSLT Variables and Parameters – Named Templates and the <xsl:call-template> Element – XSLT Functions – XSLT 2.0.

**Unit V**

**XQuery, the XML Query Language:** Why XQuery – XQuery Tools – Some XQuery Examples – The XQuery Data Model – Xquery Expressions – Xquery Functions – Using Parameters with Xquery – User defined Functions – Looking Ahead.

**XML and Databases:** Need for Efficient XML Data stores – Approaches to storing XML – Using Native XML Databases – XML in Commercial RDBMSs – XML in Open source RDBMSs – Choosing a database to store XML – Looking Ahead.

**Text Book:**

Beginning XML – Fourth Edition (2007) by David Hunter, Jeff Rafter, Joe Fawcett Wiley India Private ltd.

Unit I - Chapter 1,2
Unit II - Chapter 3,4
Unit III - Chapter 5,6 (Page No.:212 to 235)
Unit IV - Chapter 8
Unit V - Chapter 9,10

**Reference Book:**

XML Black Book 2nd Edition by Natanya Pitts, Dreamtech Press, 2001.