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

Course Name : Master of Computer Applications (MCA)
CHOICE BASED CREDIT SYSTEM
(For those who join in June 2022 and after)
Course Scheme:

II M.C.A – III Semester

Self-Learning Courses:

Subject	Credit	Ext =Tot	Subject Code
Software Testing	5	100 = 100	P22CASL31
XML	5	100 = 100	P22CASL32

SELF LEARNING
MCA - Software Testing

Subject Code : P22CASL31

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

XML

Subject Code : P22CASL32

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.