Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for MCA III Semester under Regulations 2015
Branch: Master of Computer Applications

S. No	Course Code	Course Title	Lecture	Tutorial	Practical	Credit
Theory						
1	**P15MCA301**	Java Programming	3	0	0	3
2	**P15MCA302**	Web programming Essentials	3	0	0	3
3	**P15MCA303**	Graphics and Multimedia	3	0	0	3
4	**P15MCA304**	Data Mining	3	0	0	3
5	**P15MCA305**	Software Engineering	3	0	0	3
Practical						
6	**P15MCA306**	Java Programming Laboratory	0	0	4	2
7	**P15MCA307**	Web programming Essentials Laboratory	0	0	4	2
8	**P15MCA308**	Graphics and Multimedia Laboratory	0	0	4	2
9	**P15MCA309**	Soft Skill Development Laboratory – III	0	0	2	1
					Total Credits	**22**

Approved by

Chairman, MCA BOS	**Member Secretary, Academic Council**	**Chairperson, Academic Council & Principal**
Dr.G.M.Kadhar Nawaz	**Dr.R.Shivakumar**	**Dr.S.R.R.Senthil Kumar**

Copy to:-
Director, Third Semester MCA Students and Staff, COE

SONA COLLEGE OF TECHNOLOGY, SALEM
(Autonomous)

MASTER OF COMPUTER APPLICATIONS

CURRICULUM (Semester - III)

REGULATIONS – 2015

Course Code	Course Title	Hours / Week			Credit	Maximum Marks		
		L	T	P		CIE	SEE	Total
	THEORY							
P15MCA301	Java Programming	3	0	0	3	50	50	100
P15MCA302	Web programming Essentials	3	0	0	3	50	50	100
P15MCA303	Graphics and Multimedia	3	0	0	3	50	50	100
P15MCA304	Data Mining	3	0	0	3	50	50	100
P15MCA305	Software Engineering	3	0	0	3	50	50	100
	PRACTICAL							
P15MCA306	Java Programming Laboratory	0	0	4	2	60	40	100
P15MCA307	Web programming Essentials Laboratory	0	0	4	2	60	40	100
P15MCA308	Graphics and Multimedia Laboratory	0	0	4	2	60	40	100
P15MCA309	Soft Skill Development Laboratory – III	0	0	2	1	60	40	100
				Total	**22**			

CIE – Continuous Internal Evaluation, SEE – Semester End Examinations

P15MCA301 - JAVA PROGRAMMING

L	T	P	M
3	0	0	100

COURSE OBJECTIVES:
This course will enable the student to:

- Understand and differentiate Java with other programming languages.
- Identify and relate the use of various java-programming concepts in an application.
- Be familiar with methods, packages, interfaces and inheritance concept in Java.
- Perceive the fundamentals in Exception Handling, Input/Output handling, Multithreading in Java to design applications related to it.
- Acquire an in-depth knowledge of Applets, Event handling and Swing classes to design interactive User interfaces.

UNIT I - JAVA FUNDAMENTALS 9

The Origins of Java – Java's contribution to the Internet – Java's magic the Byte code – Java Buzzwords – Object oriented programming – Obtaining the JDK – First Simple program – Handling syntax errors – A second Simple program – Semicolons and positioning – Java Keywords – Identifiers in java – Java Class libraries. – **Java Features – Java vs C, Java vs C++ - Java Virtual Machine.**

UNIT II – JAVA PROGRAMMING CONCEPTS 9

Introducing Data Types and Operators: Java's Primitive Types –Literals – Operators – Type conversion – Operator Precedence. Program Control Statements: if Statement – if-else-if – switch statement – for loop – Enhanced for loop – while loop – do-while loop – break – nested loops. Introducing Classes, Objects and Methods : Class Fundamentals – Reference Variables and Assignment –Methods –Using Parameters – Constructors – new Operator – Garbage collection – finalize() method – this keyword.

UNIT III – DATA TYPES & METHODS, INHERITANCE, PACKAGES & INTERFACES 9

More Data Types and Operators: Arrays – Strings – Command-Line Arguments – The Bitwise Operators. Closer Look at Methods and classes: Controlling Access to Class members – Pass objects to methods – Method Overloading – Overloading Constructors –Recursion – Understanding static – Introducing Nested and Inner Classes – Varargs. Inheritance: Member access and inheritance – Constructors and inheritance – Using super to Access Superclass – Method Overriding – Abstract Classes – final keyword – Object Class.
Packages & Interfaces: Packages and Member Access – Importing Packages – Interfaces static methods in Interface.

UNIT IV – EXCEPTION HANDLING, I/O, MULTITHREADING & AUTOBOXING 9

Exception Handling: Exception Hierarchy – Exception Handling Fundamentals – Multiple catch statements – Throwing an Exception – Using finally, throws – Built-in Exceptions. Using I/O: Byte Streams and Character Streams – Reading and Writing Files using Byte Streams – Random Access Files – File I/O using Character Streams. Multithreaded Programming: Multithreading fundamentals – Thread Class and Runnable Interface – Creating a Thread, Multiple threads – Thread Priorities – Synchronization – Thread communication – Main Thread. Autoboxing: Enumerations – Autoboxing Fundamentals.

UNIT V – APPLETS, EVENT HANDLING & SWING **9**

Applets Events and Miscellaneous Topics: Applet Basics – Applet architecture – Initialization & Termination – Repainting – Applet Class – Event Handling – Delegation Event Model – Events - Introducing Swing: Origin & design philosophy of Swing – Components and Containers – Layout Managers – Use JButton, JTextField, JCheckBox , JList – Anonymous Inner Classes – Create a Swing Applet – JDBC Connectivity.

TOTAL = 45 Hours

COURSE OUTCOMES:

At the end of the course the student should be able to:

- Discuss the fundamentals of Java Programming
- Develop programs illustrating the underlying programming concepts of java.
- Demonstrate programs in java using data types & methods, inheritance, packages & interfaces.
- Develop applications that illustrates exception handling, i/o, multithreading & autoboxing
- Demonstrate and design applets, event handling, JDBC & swing

REFERENCES

1. Herbert Schildt, "Java A Beginner's Guide- Create, Compile and Run Java Programs Today", Sixth Edition, Oracle Press, 2014.
2. Paul Deitel, Harvey Deitel, "Java How to Program", 9thEdition, Prentice Hall, 2012.
3. Ken Arnold, James Gosling, "The Java Programming Language", Fourth Edition, Addison Wesley, 2005.
4. "Java 6 Programming Black Book", Kogent Solution Inc, Dreamtech Press, 2007..
5. Cay S. Horstmann, Gary Cornell, "Core Java Volume I – Fundamentals", 9th Edition, PHI, 2008.
6. E. Balagurusamy, "Programming with Java 3e - A Primer", Tata McGraw Hill, 3rd Edition, 2007.
7. Herbert Schildt, "The complete Reference Java", 7th Edition, Tata McGraw Hill, 2007.

P15MCA302 - WEB PROGRAMMING ESSENTIALS

L	T	P	M
3	0	0	100

COURSE OBJECTIVES:

This course will enable the student to:

- Understand the concepts and architecture of the World Wide Web.
- Understand and practice markup languages
- Learn to create different style sheets in web pages
- Understand and practice embedded dynamic scripting on client side Internet Programming
- Understand and practice web development techniques on client-side

UNIT I - - INTRODUCTION TO WWW 9

Internet Standards – Introduction to WWW – WWW Architecture – SMTP – POP3 – File Transfer Protocol - Overview of HTTP, HTTP request – response – Overview of SOAP, SOAP-HTTP binding - Generation of dynamic web pages.

UNIT II – HTML 9

Introduction: HTML5 · Overview of HTML5 and Other Web Technologies · Fundamentals of HTML · Working with Text · Organizing Text in HTML · Working with Links and URLs, Lists, Creating Tables, Frames, Working with Images, Colors, and Canvas · Working with Forms · Interactive Elements · Working with Multimedia.

UNIT III – CSS 9

Overview of CSS, Basic syntax and structure -Inline Styles – Embedding Style Sheets - Linking External Style Sheets, Backgrounds and Color Gradients in CSS · Fonts and Text Styles · Creating Boxes and Columns Using CSS · Displaying, Positioning, and Floating an Element · List Styles · Table Layouts · Pseudo-classes and Pseudo-elements · Effects, Frames, and Controls in CSS · Implementing the Advanced Features of HTML5.

UNIT IV – JAVASCRIPT 9

Overview of JavaScript, Core features - Data types and Variables - Operators, Expressions, and Statements -Functions - Objects - Array, Date and Math related Objects , JavaScript Functions, Events, Image Maps, and Animations · JavaScript Objects · Working with Browser Objects · Working with Document Object · Document Object Model · Validation, Errors, Debugging, Exception Handling, and Security.

UNIT V – ADVANCED JAVASCRIPT 9

JSON – working with objects, arrays - conversion of JSON text to a JavaSript object - Introduction to JQuery – Selectors – Methods to access HTML attributes – methods for Traversing - Manipulators – events – effects - Introduction to AJAX – Create a simple AJAX application.

TOTAL = 45 Hours

COURSE OUTCOMES:

At the end of the course the student should be able to:

- Acquire knowledge about functionalities of World Wide Web.
- Explore markup languages features and create interactive web pages using them.
- Learn and design Client side validation using scripting languages.
- Acquire knowledge about Open source JavaScript libraries.
- Able to design front end web page and know about automated testing tools

REFERENCES

1. Kogent Learning Solutions Inc., "HTML5 Black Book: Covers CSS3, Javascript, XML, XHTML, Ajax, PHP and Jquery", First Edition, Dream Tech Press, 2011.
2. Chris Bates, "Web Programming building internet applications", 3rd Edition, wiley,2014
3. Harvey & Paul Deitel& Associates, Harvey Deitel and Abbey Deitel, "Internet and World WideWeb - How to Program", 5thEdition, Pearson Education, 2011.
4. Thomas A Powell, Fritz Schneider, "JavaScript: The Complete Reference", 3rdEdition, TataMcGraw Hill, 2013.
5. David Flanagan, "JavaScript: The Definitive Guide, 6thEdition", O'Reilly Media, 2011.
6. Steven Holzner, "The Complete Reference - PHP", Tata McGraw Hill, 2008.
7. Achyut S Godbole and AtulKahate, "Web Technologies", 2ndEdition, Tata McGraw Hill, 2012.

P15MCA303 - GRAPHICS AND MULTIMEDIA

L	T	P	M
3	0	0	100

COURSE OBJECTIVES:

This course will enable the student to:

- Gain knowledge about graphics of how content, information architecture, motion, sound, design, and technology merge to form effective interactive experiences for wide range users.
- Understand on various software programs used in the creation and implementation of multi-media such as interactive, motion / animation, presentation, etc.
- Understand the two & three dimensional graphics and their transformations.
- Understand the relationship between critical analysis and the practical application of design.
- Discuss issues related to emerging electronic technologies and graphic design.

UNIT I - INTRODUCTION 9

Introduction - Line - Circle - ellipse drawing algorithms - Applications - Two-Dimensional geometric transformations - Two-Dimensional viewing - Graphical User Interface and interactive input methods - Interactive Picture-Construction Techniques - Virtual reality Environments.

UNIT II – THREE-DIMENSIONAL CONCEPTS 9

Three-Dimensional Concepts - Three-Dimensional Object Representations - Bezier Curves - Visualizations of Data sets - Three-Dimensional geometric and modeling transformations - Three-Dimensional viewing - Visible Surface Detection - Back-Face Detection - Depth-Buffer Detection - Scan-Line Method - Basic Illumination Models - Color models.

UNIT III – MULTIMEDIA SYSTEMS DESIGN 9

Multimedia basics - Multimedia applications - Multimedia system architecture - Evolving technologies for multimedia systems - Defining objects for multimedia systems - Multimedia data interface standards - Multimedia databases.

UNIT IV – MULTIMEDIA FILE HANDLING 9

Compression and decompression - Multimedia I / O technologies - Digital voice and audio - Video image and animation - Full motion video - Storage and retrieval technologies - Optical Media.

UNIT V – HYPERMEDIA 9

Multimedia authoring and user interface - Hypermedia messaging - Distributed multimedia systems - Components - Client / Server operation - Object servers - Multi server Network Topologies - Distributed Multimedia Databases - Managing distributed objects.

TOTAL = 45 Hours

COURSE OUTCOMES:

At the end of the course the student should be able to:

- Solve specific graphic design problems effectively.
- Demonstrate effective and compelling interactive experiences for a wide range of users.
- Design applications on graphics of merging architecture, design and technology
- Handle multimedia with interactive, motion, animation and presentations using multimedia software programs.
- Exhibit the importance of technical ability and creativity within design practice.

REFERENCES

1. Donald Hearn and M. Pauline Baker, "Computer Graphics C Version", Pearson Education, 2008. (Unit - I & II)
2. Prabhat K.Andleigh and KiranThakrar, "Multimedia Systems Design", PHI, 2007. (Unit - III, IV &V)
3. Judith Jeffcoate, "Multimedia in practice: Technology and Applications", PHI, 1998.
4. Foley, Vandam, Feiner and Huges, "Computer Graphics: Principles and Practice", 2nd Edition, Pearson Education, 2003.

P15MCA304 - DATA MINING

L	T	P	M
3	0	0	100

COURSE OBJECTIVES:
This course will enable the student to:

- Understand Data mining principles and techniques and Introduce DM as a cutting edge business intelligence.
- Learn to use association rule mining for handling large data.
- Understand the concept of classification for the retrieval purposes.
- Know the clustering techniques in details for better organization and retrieval of data.
- Identify Business applications and Trends of Data mining.

UNIT I - DATA PREPROCESSING & ASSOCIATION RULE MINING 9

Need for Data Preprocessing – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization and Concept Hierarchy Generation - Association Rule Mining – Mining Frequent Item sets with and without Candidate Generation - Mining Various Kinds of Association Rules - Constraint-Based Association Mining.

UNIT II – CLASSIFICATION & PREDICTION 9

Classification vs Prediction – Data preparation for Classification and Prediction – Classification by Decision Tree Introduction – Bayesian Classification – Rule Based Classification – Classification by Back propagation – Support Vector Machines – Associative Classification – Other Classification Methods – Prediction – Accuracy and Error Measures – Evaluating the Accuracy of a Classifier or Predictor – Ensemble Methods – Model Section.

UNIT III – CLUSTERING 9

Cluster Analysis - Types of Data in Cluster Analysis – A Categorization of Major Clustering Methods –Partitioning Methods – Hierarchical methods – Density-Based Methods – Grid-Based Methods –Model-Based Clustering Methods – Clustering High- Dimensional Data – Constraint-Based Cluster Analysis.

UNIT IV – OUTLIER DETECTION 9

Outlier and Outlier Analysis-Outlier detection methods-Statistical Approaches-Proximity based approaches-Clustering based Approaches-Classification Based approaches-Mining Contextual and Collective Outliers-Outlier detection in high dimensional data.

UNIT V – DATA MINING APPLICATIONS AND TRENDS 9

Mining Complex data types-Other methodologies of Data mining-Data Mining applications-Ubiquitous and invisible Data Mining-Privacy, Security and Social impacts of Data mining-Data mining trends.

TOTAL = 45 Hours

COURSE OUTCOMES:
At the end of the course the student should be able to:

- Preprocess the data for mining applications.
- Apply the association rules for mining the data.
- Design and deploy appropriate classification techniques.

- Cluster the high dimensional data for better organization of the data.
- Evaluate various mining techniques on complex data objects.

REFERENCES

1. Jiawei Han, MichelineKamber "Data Mining Concepts and Techniques", 3rd Edition, Elsevier, Reprinted 2014.
2. G. K. Gupta "Introduction to Data Mining with Case Studies", Easter Economy Edition, Prentice Hall of India, 2006.
3. Pang-Ning Tan, Michael Steinbach and Vipin Kumar "Introduction to Data Mining", Pearson Education, 2007.
4. Soman K. P, Shyam Diwakar, V. Ajay, Data Mining, Printice Hall, 2008.
5. Arun K.Pujari, Data Mining Techniques, Universities Press (India) Limited, 2001.
6. David Hand, Heikki Mannila , Padhraic smyth, "Principles of Data Mining", the MIT Press, Massachusetts Institute of Technology , Cambridge.
7. Michal J A Berry , Gordon Linoff , "Mastering Data Mining" , John Wiley & Sons, 2000.

P15MCA305 - SOFTWARE ENGINEERING

L	T	P	M
3	0	0	100

COURSE OBJECTIVES:

This course will enable the student to:

- Understand theories, methods, and technologies applied for professional software development.
- Design and model the software development process
- Discuss the quality concepts of software products and software processes
- Understand the process of software configuration management and metrics of the software
- Understand and manage the software project development.

UNIT I - BASIC CONCEPTS 9

The Nature of Software - The Changing Nature of Software - The Software Process - Practice - Software Development Myths - software process structure - Process Models - agile development - human aspects.

UNIT II – MODELING 9

Understanding Requirements - Requirements Modeling: Scenario-Based Methods - Requirements Modeling: Class-Based Methods -Design Concepts - Architectural Design - Component-Level Design - User Interface Design - WebApp Design - MobileApp Design.

UNIT III – QUALITY MANAGEMENT 9

Quality concepts - review techniques - software quality assurance - software testing strategies - testing object-oriented applications - testing web applications - testing MobileApps.

UNIT IV – SOFTWARE CONFIGURATION MANAGEMENT 9

Software Configuration Management - The SCM Repository - The SCM Process - Configuration Management for Web and MobileApps - Product Metrics : A Framework for Product Metrics - Metrics for the Requirements Model - Metrics for the Design Model - Design Metrics for Web and Mobile Apps - Metrics for Source Code - Metrics for Testing - Metrics for Maintenance.

UNIT V – MANAGING SOFTWARE PROJECTS 9

Project management concepts - the Management Spectrum -Software Measurement - Metrics for Software Quality - estimation for software projects - The Project Planning Process - Resources - Software Project Estimation - Decomposition Techniques - project scheduling - Scheduling - risk management - maintenance and reengineering - Software Maintenance - Software Reengineering.

TOTAL = 45 Hours

COURSE OUTCOMES:

At the end of the course the student should be able to:

- Plan and deliver an effective software engineering process, based on knowledge of widely used development lifecycle models.
- Translate a requirements specification into an implementable design, following a structured and organized process.
- Evaluate the quality of the requirements, analysis and design work done during the module.
- Formulate a testing strategy for a software system, employing techniques such as unit testing, test driven development and functional testing.
- Develop and manage the software projects development.

REFERENCES

1. Roger S Pressman, R.S, "Software Engineering: A Practitioner's Approach", 7th Edition, McGraw Hill Publications, 2010.
2. James F Peters, Software Engineering, John Wiley
3. Ian Sommerville, Software Engineering, Pearson Education, 6th Edition.
4. Waruan S Jawadekar, Software Engineering, Tata McGraw Hill, 2004.
5. Carlo Ghezzi, Mehdi Jazayeri, Dino Manrioli, Fundamentals of Software Engineering, PHI, 2001.
6. PankajJalote, An Integrated approach to Software Engineering Narosa.

P15MCA306 - JAVA PROGRAMMING LABORATORY

		L	T	P	M
P15MCA306	**Java Programming Laboratory**	**0**	**0**	**4**	**100**

COURSE OBJECTIVES:

This course will enable the student to

- Realize the basic programming skills in Java
- Understand the different packages and Classes in Java
- Interpret the need of User Interfaces in Java and implement the same using the inbuilt Classes available in Java
- Perceive the significance of threads in Java
- Acknowledge the significance of Database connectivity in Java

List of Experiments:

1. Create an application that demonstrates Class, Methods and Objects in Java.
2. Implement an application in Java which displays
   a. Fibonacci b. Factorial c. Palindrome
3. Implement an application that uses all the methods of the STRING class.
4. Implement an application in java that reads from a file "XXX" and also write the same into another file "YYY" using IO package
5. Create a package "XXX" which includes the class INTEREST with principle, rate of interest, numbers of years, as attributes and a method DISPLAYITEM() which accept all the details using constructor. Also create an interface having a method CALCULATE () which takes rate, year and principle as arguments. Implement the package in a class.
6. Design the poster for the college technical event using AWT controls
7. Implement an application in java that demonstrates the following Layout Managers
   a. Flow b. Grid c. Grid Bag d. Border e. Card f. Box
8. Create an application in Java that demonstrates the following Inner Classes
   a. Local Inner b. Member Inner c. Anonymous
9. Implement Multithread in Java
10. Create application form for employment User Interface to collect details using Swing component
11. Create an application in Applet that demonstrates Color Changer
12. Implement an application that demonstrates Student Information System using JDBC

COURSE OUTCOMES:
On completion of the course, the student will be able to

- Design an application in Java based on the requirements
- Demonstrate applications that utilizes in-built as well as user-defined classes & packages with methods and interfaces
- Design effective User interfaces using the in-built Classes in Java
- Implement application in Java that demonstrate Applet, Database connectivity
- Design an application in Java based on the requirements

P15MCA307 - WEB PROGRAMMING ESSENTIALS LABORATORY

		L	T	P	M
P15MCA307	**Web Programming Essentials Laboratory**	**0**	**0**	**4**	**100**

The following experiments should be practiced

1 Create a web page with the following using HTML

(i) To embed an image map in a web page

(ii) To fix the hot spots

(iii) Show all the related information when the hot spots are clicked.

2 Design an HTML5 interactive webpage using links, lists, forms, tables and style for any of the application.

3 Create a web page with all types of Cascading style sheets.

4 Implement Client Side Scripts for Validating Web Form Controls using JavaScript.

5 Designing Quiz Application Personal Information System using JavaScript

6 Write a JavaScript for Loan Calculation.

7 Develop and demonstrate a HTML file that includes JavaScript that uses functions for the following problems:

a) Parameter: A string

Output: The position in the string of the left-most vowel

b) Parameter: A number

Output: The number with its digits in the reverse order

8 Draw rectangle, circle, line and text with color gradients on a canvas using HTML and JavaScript.

9 Write an AJAX program for parsing a JSON file and formatting the output.

10 Develop a web application for Airline Reservation System using HTML and AJAX.

TOTAL: 45 hours

COURSE OUTCOMES:
On completion of the course, the student will be able to

- Acquire knowledge about functionalities of World Wide Web
- Explore markup languages features and create interactive web pages using them.
- Learn and design Client side validation using scripting languages
- Acquire knowledge about Open source JavaScript libraries.
- Able to design front end web page and know about automated testing tools

P15MCA308 - Graphics and Multimedia LABORATORY

		L	T	P	M
P15MCA308	**Graphics And Multimedia Laboratory**	**0**	**0**	**4**	**100**

Using C or C++

1. To implement Bresenham's Line, Circle Drawing algorithms
2. To implement Two Dimensional Transformations such as Translation, Rotation and Scaling, reflection and shearing
3. To implement Cohen-Sutherland 2D Line Clipping algorithm.
4. To perform 3D Transformations such as Translation, Rotation and Scaling.
5. To visualize projections of 3D images and Hidden Surface Elimination.
6. To implement the Conversion between the color models.

Using Adobe Photoshop, Imageready, Flash,Audio,Video Editing tools etc.,

7. To implement compression and decompression for image, audio and video files.
8. To perform basic operations on image, audio and video using any editing software.
9. To create cartoon animation using any animation software.
10. To create a multimedia presentation using all multimedia elements.

TOTAL: 45 hours

COURSE OUTCOMES:

On completion of the course, the student will be able to

- Gain knowledge on basic graphic primitives
- Exhibit the talents in transforming the graphical images in two and three dimensional viewing
- Apply the skill to clip the image object and project the image into camera view
- Handle multimedia with interactive, motion, animation and presentations using multimedia software programs
- Handle multimedia with interactive presentations using multimedia software programs.

P15MCA309 - SOFT SKILL DEVELOPMENT LABORATORY –III

		L	T	P	M
P15MCA309	**SOFT SKILL DEVELOPMENT LABORATORY –III**	**0**	**0**	**2**	**100**

Semester – III

Focus on Language

- Suffix, Prefix, Error detection, Compound Noun, Countable / uncountable nouns

Writing

- Report writing, proposal writing

Reading

- Understanding notices, messages, timetables, advertisements, graphs, etc.
- Reading passages for specific information transfer

Total – 30 hours

COURSE OUTCOMES:

- Relate and understand Nouns, suffix and prefix
- Demonstrate writing skills in Report writing
- Demonstrate writing skills in proposal writing.
- Demonstrate Reading skills by understanding the content
- Understand advertisements, graphs and read the content in them.