SACRED HEART COLLEGE (AUTONOMOUS)

Tirupattur – 635 601, Tamil Nadu, S.India

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Ready for
Every Good Work

A Don Bosco Institution of Higher Education, Founded in 1951 * Affiliated to Thiruvalluvar University, Vellore * Autonomous since 1987
Accredited by NAAC (4th Cycle – under RAF) with CGPA of 3.31 / 4 at 'A+' Grade

M.Sc. Computer Science

Sem	Code	Subject	L	T	P	C	CA	Sem	Total
I		Mathematical Foundation for Computer Science **(IDC)**	5	0	0	3	40	60	100
		Advanced Java Programming	4	1	0	3	40	60	100
		Python Programming	3	1	0	3	40	60	100
		Open Source Technologies	3	1	0	3	40	60	100
		Elective-I: a. Web Services b. Database Administration c. Decision Support System	4	0	0	3	40	60	100
		Practical – I: Advanced Java Programming	0	0	2	2	40	60	100
		Practical – II: Python Programming	0	0	2	2	40	60	100
		Practical – III: Open Source Technologies	0	0	2	2	40	60	100
		Business Communication	2	0	0	0	100	-	100
		IDCC – I	**30Hrs**	**0**	**0**	**2#**	**100**	**-**	**100**
		Total	**21**	**3**	**6**	**21+2#**	**-**	**-**	**30**
II		Principles of Compiler Design	5	0	0	3	40	60	100
		Enterprise Java Programming	4	1	0	3	40	60	100
		Desktop Application Using C#.NET	3	1	0	3	40	60	100

		Cryptography and Network Security	3	1	0	3	40	60	100
		Elective-II: a. Object Oriented Analysis and Design b. Data Communication and Networks c. Software Project Management	4	0	0	3	40	60	100
		Practical - IV: Enterprise Java Programming	0	0	2	2	40	60	100
		Practical - V: Desktop Application Using C#.NET	0	0	2	2	40	60	100
		Practical – VI : Cryptography and Network Security	0	0	2	2	40	60	100
		Quantitative Aptitude	2	0	0	-	100	-	100
		Technology Trends – I	0	0	0	1	100	-	100
		Department Domain – I	**20Hrs**	**10Hrs**	**0**	**2***	**100**	**-**	**100**
		Department Domain – II	**20Hrs**	**10Hrs**	**0**	**2***	**100**	**-**	**100**
		Total	**21**	**3**	**6**	**22+4***	**-**	**-**	**30**
III		Internet Of Things	4	0	0	3	40	60	100
		Distributed Operating System	4	0	0	3	40	60	100
		Web Application Using ASP.NET	4	1	0	3	40	60	100
		Mobile Applications	4	1	0	3	40	60	100
		Elective - III: a. Cloud Computing b. Semantic Web c. Data Science	4	0	0	3	40	60	100
		Practical-VII: Web Application Using ASP.NET	0	0	2	2	40	60	100
		Practical -VIII: Mobile Applications	0	0	2	2	40	60	100
		Software Project – I	0	0	2	2	40	60	100

			L	T	P	C	CIA	ESE	Total
		Soft Skills	2	0	0	-	100	-	100
		Industrial Plant Training	0	0	0	2	100		100
		Technology Trends – II	0	0	0	1	100	-	100
		Department Domain – III	20Hrs	10Hrs	0	2*	100	-	100
		Department Domain – IV	20Hrs	10Hrs	0	2*	100	-	100
		Total	22	2	6	24+4*	-	-	30
IV		Design and Analysis of Algorithms	4	1	0	3	40	60	100
		Software Testing and Quality Assurance	4	1	0	3	40	60	100
		Elective-IV: a. Big Data Analytics b. Machine Learning c. Security Systems	4	0	0	3	40	60	100
		Research Paper	2	0	0	2	100	-	100
		Practical - IX: Design and Analysis of Algorithms	0	0	4	2	40	60	100
		Practical - X: Software Testing	0	0	2	2	40	60	100
		Software Project – II	0	0	6	5	40	60	100
		Human Rights	2	0	0	2	40	60	100
		Technology Trends – III	0	0	0	1	100	-	100
		IDCC – II	30Hrs	0	0	2#	100	-	100
		Total	16	2	12	23+2#	-	-	30
		Grand Total	80	10	30	90+4#+8*	-	-	120

Sacred Heart College (Autonomous), Tirupattur District

1.2.1 List of New Courses

Department: M. SC. COMPUTER SCIENCE

S. NO	COURSE CODE	COURSE NAME
1	MCS161T	Principles of Compiler Design
2	MCS162T	Advanced Java Programming
3	MCS163T	Desktop Applications
4	MCS164T	Open Source Technologies

5	MCS165A	Web Services
6	MCS165B	Data Mining and Warehousing
7	MCS165C	Decision Support System
8	MCS166P	Practical – I: Advanced Java Programming
9	MCS167P	Practical –II : Desktop Applications
10	MCS168P	Practical – III:Open Source Technologies
11	MCS260T	Distributed Operating System
12	MCS261T	Enterprise Java Programming
13	MCS262T	WEB APPLICATION USING ASP.NET
14	MCS263T	Programming in Python
15	MCS264A	Object Oriented Analysis and Design
16	MCS264B	Software Testing and Quality Assurance
17	MCS264C	Software Project Management
18	MCS265P	Practical - IV: Enterprise Java Programming
19	MCS266P	Practical - vii: web application using asp.net
20	MCS267P	Practical -VI: Programming in Python

Syllabus

Semester - II   **5-0-0:3:40:60**

OBJECTIVES
- To know the basic concepts of compilers.
- To explore the phases of a compiler
- To know how the source program is executed in the compiler.
- To bring in the types of grammer
- To create a new compiler

UNIT - I: INTRODUCTION
Introduction to Compiling – Compilers - Analysis of the source program - The phases -The grouping of phases - Compiler construction tools.

UNIT - II: LEXICAL ANALYSIS
The role of the lexical analyzer - Input buffering - Specification of tokens - Recognition of tokens - A language for specifying lexical analyzer.

UNIT - III: SYNTAX ANALYSIS
Syntax Analysis - The role of the parser – Context - free grammars -Writing a grammar - Topdown parsing – Bottom - up Parsing.

UNIT - IV: INTERMEDIATE CODE GENERATION
Intermediate languages – Declarations - Assignment statements - Boolean expressions - Case statements – Backpatching - Procedure calls.

UNIT - V: CODE GENERATION
Issues in the design of a code generator - The target machine - Run-time storage management -Basic blocks and flow graphs - Next-use information.Case Study-LEX-YACC.

TEXT BOOK
1. Alfred V. Aho, Ravi Sethi Jeffrey D. Ullman, "Compilers- Principles, Techniques, and Tools", Pearson Education Asia, 2006

REFERENCES
1. David Galles, "Modern Compiler Design", Pearson Education Asia, 2007
2. Steven S. Muchnick, "Advanced Compiler Design & Implementation", Morgan Kaufmann Pulishers, 2000
3. C. N. Fisher and R. J. LeBlanc, "Crafting a Compiler with C", Pearson Education, 2000

WEB REFERENCES
Online Tutorial
> http://www.dreamincode.net/forums/topic/268945-an-introduction-to-compiler-design-part-ii-parsing
> https://ideone.com/

BLUE PRINT OF THE SEMESTER QUESTION PAPER

Section	Type and Choice	Marks	Number of Questions from					Total Questions in each Section
			Unit I	Unit II	Unit III	Unit IV	Unit V	
A	**ANY EIGHT**	2	2	2	2	2	2	10
B	**EITHER OR TYPE**	4	1 Pair	1 Pair	1 Pair	1 Pair	1 Pair	5 Pairs
C	**ANY THREE**	8	1	1	1	1	1	5
TOTAL NUMBER OF QUESTIONS			4	4	4	4	4	20

Semester - I   **4-1-0:3:40:60**

ADVANCED JAVA PROGRAMMING

OBJECTIVES
- To Develop Java Applet Programs using various techniques
- To Develop applications using Abstract Window Toolkit
- To Update and retrieve the data from the databases using JDBC-ODBC
- To Develop server side programs using Servlets
- To Develop Java Applications using collections.

UNIT -I: APPLETS AND GUI
Applet Fundamentals- Applet Class - Applet lifecycle- Steps for Developing Applet Programs- Passing Values through Parameters- Graphics in Applets; GUI Application - Dialog Boxes - Creating Windows - Layout Managers – AWT Component classes – Swing component classes- Borders – Event handling with AWT components - AWT Graphics classes - File Choosers - Color Choosers – Tree – Table –Tabbed panels–Progressive bar - Sliders.

UNIT- II: JDBC AND JAVA NETWORKING

JDBC -Introduction - JDBC Architecture - JDBC Classes and Interfaces – Database Access with MySQL -Steps in Developing JDBC application - Creating a New Database and Table with JDBC - Working with Database Metadata; Java NetworkingBasics of Networking - Networking in Java- Socket Program using TCP/IP - Socket Program using UDP- URL and Inetaddressclasses.

UNIT- III: COLLECTIONS AND DESIGN PATTERNS

Collection Framework - ArrayList class - LinkedList class - ArrayListvs Linked List - ListIterator interface - HashSet class, LinkedHashSet class, TreeSet class PriorityQueue class - Map interface, HashMap class, LinkedHashMapclass ,TreeMap class - Comparable interface , Comparator interface, Comparable vs Comparator; Design Patterns: Introduction to Design patterns - Catalogue for Design Pattern - Factory Method Pattern, Prototype Pattern, Singleton Pattern, Adapter Pattern, Proxy Pattern, Decorator Pattern, Command Pattern, Template Pattern, Mediator Pattern;

UNIT -IV: SERVLET AND JSP

Servlet: Advantages over Applets - Servlet Alternatives - Servlet Strengths - Servlet Architecture - Servlet Life Cycle – GenericServlet, HttpServlet - First Servlet - Invoking Servlet - Passing Parameters to Servlets - Retrieving Parameters - Server-Side Include – Cookies; JSP : JSP Engines - Working with JSP - JSP and Servlet - Anatomy of a JSP Page.

UNIT -V: WEB PROGRAMMING

Client-Side Programming: Client-side programming technologies - Form design using HTML, XHTML and DHTML and CSS - Client side validation Using JavaScript - Content Structuring using XML - Adding Interactivity with AJAX - JQuery Framework;

Server-side Programming: Web Servers - Handling request and response - Handling Form data - Session management - Database Access.

TEXT BOOK
1. S. Sagayaraj, R. Denis, P.Karthik & D. Gajalakshmi "Java Programming", Universities Press, 2017.

REFERENCES
1. Stephanie Bodoffetl., "The J2EETM Tutorial", Pearson Education, Second Edition, 2005.
2. David R. Heffelfinger, "JasperReports for Java Developers Create, Design, Format, and Export Reports with the World's Most Popular Java Reporting Library", Packt publications, Third Edition, 2006
3. Patrick Naughton& Herbert Schildt, "The Complete Reference: Java 2", Tata McGraw Hill, 1999.

4. Deitel&Deitel, "Java How to Program", Prentice Hall, 5th Edition, 2002
5. Peter Haggar, "Practical Java: Programming Language Guide", Addison-Wesley Pub Co, 1st Edition, 2000.
6. C.Muthu, "Programming with Java", McGraw Hill, Second Edition, 2008

WEB REFERENCES

http://math.hws.edu/javanotes/c6/index.html
http://www.tutorialspoint.com/awt/
www.studytonight.com
www.javatpoint.com
www.learnjavaonline.org
www.codingbat.com

BLUE PRINT OF THE SEMESTER QUESTION PAPER

Section	Type and Choice	Marks	Number of Questions from					Total Questions
			Unit I	Unit II	Unit III	Unit IV	Unit V	
A	**ANY EIGHT**	2	2	2	2	2	2	10
B	**EITHER OR TYPE**	4	Theory or Theory	Theory or Program	Theory or Program	Program or Program	Program or Program	5 Pairs
C	**ANY THREE**	8	Theory	Theory or Program	Program	Program	Theory or Program	5
TOTAL NUMBER OF QUESTIONS			4	4	4	4	4	20

DESKTOP APPLICATION USING C#.NET

OBJECTIVES

- To know the differences between desktop and web application.
- To construct classes, methods, and accessor and instantiate objects.
- To create and manipulate GUI components in C#.
- To code solutions and compile C# projects within the .NET framework.
- To build own desktop application with Database

UNIT - I: INTRODUCTION TO C#

Introduction to .NET – Features of C# - Data Types – Value Types – Reference Types - Variables and Constants – Declaring – Assigning values – variables of nullable types – Operators – Type Conversions – Implicit and Explicit Type Conversions – Arrays – Single Dimensional and Multidimensional – Control Flow Statements – Selection – Iteration and Jump – Classes and Objects – Access Modifiers – Defining a Class – Variables – Properties and Methods – Creating Objects – Constructor and Destructors.

UNIT - II: WINDOWS FORMS

Windows Forms – Form Class – Common Operations on Forms – Creating a Message Box –Handling Events – Mouse Events – Keyboard Events – Common Controls in Windows Forms – Label – TextBox – Button – Combo Box – List Box – Check Box – Radio Button – Group Box – Picture Box – Timer – Open File Dialog – Save File Dialog – Font Dialog – Color Dialog – Print Dialog – Tree View – Menu.

UNIT - III: DELEGATES AND EVENTS

Delegates – Declaring a Delegate – Defining Delegate Methods – Creating and Invoking Delegate Objects – Multicasting with Delegates – Events – Event Sources – Event Handlers – Events and Delegates.

UNIT - IV: REFLECTION AND REMOTING

Life Cycle of threads-Using Reflection – Reflecting the Members of a Class - Dynamic Loading and Reflection - .NET Remoting – Architecture – Hosting of Objects – Single Ton and Single Call – Remoting Server – Remoting Client.

UNIT - V: DATABASE

Creating Connection String – Creating a Connection to a Database – Creating a Command Object – Working with Data Adapters – Using Data Reader to work with Databases – Using Dataset.

TEXT BOOKS

1. Vikas Gupta , "Comdex .NET Programming " , Dream Tech Press, New Delhi, 2011
2. Kogent Solutions, " C# 2008 Programming Black Book", Dream Tech Press, New Delhi, Platinum Edition, 2009

REFERENCES
1. Rebecca M.Riordon, "Microsoft ADO .Net 2.0 Step by Step", Prentice Hall of India Private Limited, New Delhi, 2007
2. David S.Platt , "Introducing Microsoft .Net", Prentice Hall of India(Private) Limited, Third Edition, New Delhi, 2006

WEB REFERENCES
Online Tutorial

http://csharp.net-tutorials.com/index.php
http://csharp.net-tutorials.com/classes/introduction/
http://www.homeandlearn.co.uk/csharp/csharp.html

Online Quiz

http://www.indiabix.com/c-sharp-programming/questions-and-answers/
https://www.wiziq.com/online-tests/43860-c-basic-quiz
http://www.withoutbook.com/OnlineTestStart.php?quizId=71

Online Compiler

http://www.compileonline.com/compile_csharp_online.php
http://www.ideone.com

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Section	Type and Choice	Marks	Number of Questions from					Total Questions
			Unit I	Unit II	Unit III	Unit IV	Unit V	
A	**ANY EIGHT**	2	2	2	2	2	2	10
B	**EITHER OR TYPE**	4	Theory or Theory	Theory or Program	Theory or Program	Program or Program	Program or Program	5 Pairs
C	**ANY THREE**	8	Theory	Theory or Program	Program	Program	Theory or Program	5
TOTAL NUMBER OF QUESTIONS			4	4	4	4	4	20

OPEN SOURCE TECHNOLOGIES

OBJECTIVES
- To learn designing webpage using HTML & CSS
- To understand the concept of Database
- To learn Server side scripting language
- To understand the need of AJAX
- To develop applications using PHP with MYSQL

Unit - I: HTML
Web Page and Web Site – Dynamic and Static Pages – Basic Document Structure – Attribute Groups – Text Formatting – Presentational, Phrase Elements – Lists - Editing Text - Character Entities for Special Characters – Links and Navigation - Links – Directories and Directory Structures – Creating Links– Colors, Images and Objects – Images as Links – Tables – Table Elements and Attributes –Advanced Tables – Accessibility issues with Tables.

Unit - II: ADVANCED HTML
Forms – Form Controls – Label - structuring forms – Focus- Frames – The Frameset, Frame noframes Element – Creating Links between Frames – Nested Framesets- Cascading Style Sheets – CSS – CSS properties –Text Formatting – Text Pseudo-Classes – Selectors – Lengths - Percentages – More CSS – Links – Backgrounds – Lists – Tables - Outlines- Positioning with CSS.

Unit - III: PHP AND APACHE
Accessing PHP - Creating a Sample Application - Embedding PHP in HTML - Adding Dynamic Content -Accessing Form Variables - Identifiers - Examining Variable Types - Declaring and Using Constants - Variable Scope - Using Operators - Precedence and Associativity - Variable Functions - Making Decisions with Conditionals - Repeating Actions Through Iteration- Accessing MySQL Database from the Web with PHP. APACHE: Introduction - Apache Explained - Starting, Stopping, and Restarting Apache.

Unit - IV: MYSQL
Introduction to MY SQL - The Show Databases and Table - The USE command - Create Database and Tables - Describe Table - Select, Insert, Update, and Delete statement - Some Administrative detail - Table Joins - Loading and Dumping a Database.

Unit - V: PHP with AJAX
PHP with AJAX: Introducing Ajax-Ajax Basics - HTTP Request and Response Fundamentals **-** The XMLHttpRequest Object **-** PHP and Ajax- Client - Driven Communication, Server-Side Processing - Expanding and Contracting Content - Auto-Complete - Form Validation - Tool Tips - Database Driven Ajax.

TEXT BOOKS

1. Jon Ducket, "Web Programming with HTML, CSS & JavaScript", Wiley Publishing, 2005.
2. Luke Welling, Laura Thomson "PHP and MySQL Web Development" Pearson Education Inc., Fourth Edition, 2008
3. James Lee and Brent Ware, "Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP", James Lee and Brent Ware, Dorling Kindersley(India) Pvt. Ltd, 2008
4. Lee Babin, "Beginning Ajax with PHP From Novice to Professional", Apress, 2007

REFERENCES

1. Alexis Goldstein, Louis Lazaris, Estelle Weyl. "Html5 & CSS3 for the Real World".
2. Eric Rosebrock, Eric Filson, "Setting up LAMP: Getting Linux, Apache, MySQL, and PHP and working Together", Published by John Wiley and Sons, 2004
3. Steven D. Nowicki, Alec Cove, Heow Eide-goodman ,"Professional PHP", Wrox Press, 2004.
4. Shawn M. Lauriat, "Advanced Ajax Architecture and Best Practices", Prentic Hall, 2008

WEB REFERENCES

Online Tutorial

http://my.safaribooksonline.com/book/databases/mysql/020177061x
www.w3schools.com,
www.php.net,
www.phpclasses.org

Online Quiz

http://www.w3schools.com/html/html_quiz.asp
http://www.realinformation.net/Apache_Server_Popquiz.htm
http://www.withoutbook.com/OnlineTestStart.php?quizId=31
http://www.myphpquiz.com/

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Section	Type and Choice	Marks	Number of Questions from					Total Questions
			Unit I	Unit II	Unit III	Unit IV	Unit V	
A	**ANY EIGHT**	2	2	2	2	2	2	10
B	**EITHER OR TYPE**	4	Theory or	Theory or	Theory or	Program or	Program or	5 Pairs

			Theory	Program	Program	Program	Program	
C	**ANY THREE**	8	Theory	Theory or Program	Program	Program	Theory or Program	5
TOTAL NUMBER OF QUESTIONS			4	4	4	4	4	20

Semester – I   4-0-
<center>**0:3:40:60**</center>

<center>ELECTIVE – I: a. WEB SERVICES</center>

OBJECTIVES
- To examine fundamental XML technology
- To understand the use of JSON
- To gain an understanding about the role of web services in commercial applications
- To learn the emerging standard protocols like SOAP, WSDL and UDDI.
- To introduce the role of web services in CMS

UNIT - I: XML TECHNOLOGY FAMILY
XML – benefits – Advantages of XML over HTML, EDI, Databases – XML based standards –DTD – XML Schemas – X-Files – XML processing – DOM – SAX – presentation technologies– XSL – XHTML – voiceXML – Transformation – XSLT – XLINK – XPATH.

UNIT - II: JSON AND JSON SCHEMA
Introduction to JSON – JSON Comparison with XML – JSON syntax, Datatypes, Objects – Examples – JSON Schema: Hello World! – The type Keyword – Declaring a JSON schema – JSON schema reference: Type specific keywords – Generic Keywords – Combining schemas – The $schema Keyword – Regular Expression – Structuring a complex schema: Reuse.

UNIT - III: ARCHITECTING WEB SERVICES
Business motivations for web services – B2B – B2C – Technical motivations – limitations of CORBA and DCOM – Service-oriented Architecture (SOA) – Architecting web services –Implementation view – web services technology stack – logical view – composition of web services – deployment view – from application server to peer to peer – process view – life in the runtime.

UNIT - IV: WEB SERVICE BUILDING BLOCKS: SOAP, WSDL AND UDDI
Introduction to SOAP – Basic SOAP syntax – Sending SOAP messages – Future of SOAP – Introduction to WSDL – Basic WSDL syntax- SOAP binding – Introduction of UDDI – UDDI API – Future of UDDI.

UNIT - V: XML-E-BUSINESS & XML-CONTENT MANAGEMENT SYSTEM
Business to Business – Business to Customer – Different types of B2B Interaction – Components of E-business XML Systems – Enterprise Integration – ebXML – RosettaNet – Introduction of Web Content Management – Components of Content Management System – Role of XML in Web Content Management – Role of metadata (RDF and PRISM) in Web Content Management.

TEXT BOOKS
1. Ron Schmelzer et al. "XML and Web Services", Pearson Education, 2002.
2. Micheal Droettboom, "Understanding JSON Schema Release 1.0", 2013.

REFERENCES
1. Ethan Cerami, "Web Services Essentials", O'Reilly, Shroff Publishers & Distributors Pvt.Ltd, Fourth Edition, 2002.
2. Sandeep Chatterjee and James Webber, "Developing Enterprise Web Services: An Architect's Guide", Prentice Hall Edition, 2004.

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www.w3schools.com/xml/

https://www.tutorialspoint.com/xml/

www.xmlmaster.org/en/article/d01/

www.quackit.com/xml/tutorial/

www.tutorialspoint.com/webservices/

www.javatpoint.com/web-services-tutorial

tutorials.jenkov.com/web-services/

BLUE PRINT OF THE SEMESTER QUESTION PAPER

Section	Type and Choice	Marks	Unit I	Unit II	Unit III	Unit IV	Unit V	Total Questions in each Section
A	**ANY EIGHT**	2	2	2	2	2	2	10
B	**EITHER OR TYPE**	4	1 Pair	1 Pair	1 Pair	1 Pair	1 Pair	5 Pairs
C	**ANY THREE**	8	1	1	1	1	1	5
TOTAL NUMBER OF QUESTIONS			4	4	4	4	4	20

LEARNING OBJECTIVES

- To understand data mining principles and techniques and Introduce DM as a cutting edge business

  intelligence
- To expose the students to the concepts of data warehousing architecture and implementation
- To study the overview of developing areas – web mining, text mining and ethical aspects of data

  mining
- To identify business applications and trends of data mining

UNIT- I: DATA MINING AND PREPROCESSING

Data Mining - Kinds of Data – Kinds of patterns –Used technology – Kinds of Applications – Issues in Data mining .Know Your Data: Data objects and Attributes Types –Basic Statistical Description of Data –Data Visualization – Measuring Data Similarity and Dissimilarity. Data Processing –Data Cleaning – Data Integration – Data Reduction –Data Transformation and data Discretization.

UNIT - II: DATA WAREHOUSING AND OLAP

Data Warehousing–Data Warehouse Architecture- Design and Usage –Data Warehouse Implementation – OLAP operations- ROLAP- MOLAP-Association Rules: Apriori Algorithm- FP- tree Growth Algorithm.

UNIT - III: CLASSIFICATION TECHNIQUES

Classification: Basic Concepts – Decision Tree Induction – Bayes Classification Methods – Rule-Based classification –Model Evaluation and Selection – Techniques to Improve Classification Accuracy.

UNIT - IV: CLUSTER ANALYSIS

Cluster Analysis – Partitioning Methods – Hierarchical Methods – Density-Based Methods – Grid-Based Methods – Evaluation of Clustering- categorical clustering algorithms-STIRR-ROCK-COCTUS- Case Study: Back Propagation-Support Vector Machines.

UNIT - V: WEB MINING

Web Content Mining- Web Structure Mining- Web Usage Mining- Text Mining-Unstructured Text- Episode rule discovery for texts- hierarchy of categories- Text Clustering- Temporal Data Mining- rules- sequence mining- GSP algorithm- Event Prediction Problem- Genetic Algorithm-Time Series Analysis- Spatial Mining- tasks-clustering-trends.

TEXT BOOKS

1. JiaweiHan, MichelineKamber and Jian Pei, "Data Mining Concepts and Techniques", Morgan Kauffmann Publishers, Third Edition, 2012
2. Arun K Pujari, "Data Mining Techniques", Universities Press (India) private Limited, Fourth Edition, 2017.

REFERENCES
1. K.P. Soman, ShyamDiwakar and V. Ajay, "Insight into Data mining Theory and Practice",
   Easter Economy Edition, Prentice Hall of India, 2006
2. G. K. Gupta, "Introduction to Data Mining with Case Studies", Easter Economy Edition, Prentice Hall of India, 2006
3. Berson, Alex & Smith, Stephen J, "Data Warehousing, Data Mining, and OLAP", TMH Pub.Co. Ltd, New Delhi, 2012
4. Pang-Ning Tan, Michael Steinbach and Vipin Kumar, "Introduction to Data Mining", Pearson Education, 2007

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http://www.scribd.com/doc/5710731/mining-background-literature-review
http://www.scribd.com/doc/104389040/Why-Mining
http://www.scribd.com/doc/6283008/Data-Integration-Data-Mining-Clinical-Research
http://www.selectbs.com/products-general/what-is-business-intelligence
http://www.scribd.com/doc/30346964/Business-intelligence

LEARNING OUTCOMES

- Evolve multidimensional intelligent model from typical system
- Discover the knowledge imbibed in the high dimensional system
- Evaluate various mining techniques on complex data objects

Semester - I   **4-0-0:3:40:60**

ELECTIVE – I: c. DECISION SUPPORT SYSTEM

OBJECTIVES

- To introduce the data models and to expose the concept of Knowledge Engineering Process.
- To recognize the relationship between business information needs and decision making
- To appraise the general nature and range of decision support systems
- To appraise issues related to the development of DSS
- To select appropriate modeling techniques
- To analyze, design and implement a DSS

UNIT - I: INTRODUCTION

Management Support systems, Decision making, Models, DSS Overview, Data, Model, Knowledge Management system.

UNIT – II: DATA AND MODEL MANAGEMENT SYSTEMS

Data Collection, Data Warehousing, Data Mining, Data visualization, Modeling, Static and dynamic, Optimization, Heuristic, Simulation, Multidimensional modeling.

UNIT - III: GSS, ENTERPRISE DSS, KMS

Group support system, Technologies, Enterprise DSS, Knowledge management methods, Tools Technologies.

UNIT – IV: KNOWLEDGE BASED DSS

Artificial Intelligence, Expert System, Knowledge Acquisition and validation, Knowledge representation, Inference techniques.

UNIT – V: ADVANCED INTELLIGENT SYSTEMS

Neural Computing, Fuzzy Logic, Intelligent Agents, Implementation, Integration, Intelligent DSS.

TEXT BOOK

1. Efraim Turban and Jay E. Aronson, Decision Support System and Intelligent Systems, Prentice Hall International, 9th Edition 2010.

REFERENCES

1. Janakiraman V. S and Sarukesi K, Decision Support Systems, Prentice Hall of India, 6th Printing
   2006.
2. Lofti, Decision Support System and Management, McGraw Hill Inc, International Edition, New
   Delhi 1996.
3. Marakas, Decision Support System, Prentice Hall International, Paperback Edition, New Delhi,
   2003

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ndwrcdp.werf.org/documents/WU-HT-03-35/DSS%20Tutorial.pdf
www.slideshare.net/sursayantan92/decision-support-systemdss
www.uky.edu/BusinessEconomics/dssakba/instmat.htm
https://ceit.aut.ac.ir/~shiry/lecture/DSS/Introduction.ppt

BLUE PRINT OF THE SEMESTER QUESTION PAPER

Section	Type and Choice	Marks	Number of Questions from					Total Questions in each Section
			Unit I	Unit II	Unit III	Unit IV	Unit V	
A	**ANY EIGHT**	2	2	2	2	2	2	10
B	**EITHER OR TYPE**	4	1 Pair	1 Pair	1 Pair	1 Pair	1 Pair	5 Pairs
C	**ANY THREE**	8	1	1	1	1	1	5
TOTAL NUMBER OF QUESTIONS			4	4	4	4	4	20

Semester - I   **0-0-2:2:40:60**

PRACTICAL - I: ADVANCED JAVA PROGRAMMING

1. Develop Applet Programming with various techniques.
2. Develop applications using AWT.
3. Working with Graphics ,Color and Font
4. Working with JDBC Classes(Database Operations- Create, Insert, Delete, Update, Select)
5. Handling ResultSet and Statements.
6. Jasper Report Generation
7. Working with Servlet and JDBC
8. Handling Client/Server Networking
9. Develop Java Server Pages applications using JSP Tags.
10. Working with Java Collections.

BLUE PRINT OF THE SEMESTER QUESTION PAPER

Section	Type and Choice	Marks	Questions in Section
A (Exercise 1 – 5)	**EITHER OR TYPE**	25	1 Pair
B (Exercise 6 – 10)	**EITHER OR TYPE**	25	1 Pair
TOTAL NUMBER OF QUESTIONS			2

Syllabus

Semester - II   **0-0-2:2:40:60**

PRACTICAL - V: DESKTOP APPLICATION USING C#.NET

1.   Variables, Constants and Arrays
2.   Classes and Objects
3.   Inheritance
4.   Polymorphism
5.   Windows Form Controls (Label, Text, Button, Check Box, Radio)
6.   Windows Form Controls (List, Combo, Timer, Group Box, Picture Box)
7.   Menu Handling
8.   Reflection
9.   ADO.NET Connection
10.   Data Command

BLUE PRINT OF THE SEMESTER QUESTION PAPER

Section	Type and Choice	Marks	Questions in Section
A (Exercise 1 – 5)	**EITHER OR TYPE**	25	1 Pair
B (Exercise 6 – 10)	**EITHER OR TYPE**	25	1 Pair
TOTAL NUMBER OF QUESTIONS			2

PRACTICAL - III: OPEN SOURCE TECHNOLOGIES

1. Text Formatting
2. Lists
3. Links and Navigation
4. Table Elements and Attributes
5. Form Elements
6. CSS
7. Variable and Operators
8. Control Statements and Functions
9. Database Application with MYSQL
10. PHP and Ajax

BLUE PRINT OF THE SEMESTER QUESTION PAPER

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A (Exercise 1 – 5)	**EITHER OR TYPE**	25	1 Pair
B (Exercise 6 – 10)	**EITHER OR TYPE**	25	1 Pair
TOTAL NUMBER OF QUESTIONS			2

DISTRIBUTED OPERATING SYSTEMS

OBJECTIVES

- To understand the fundamental concepts of operating systems
- To understand the need for distributed systems.
- To get acquainted with the design principles of distributed operating systems.
- To explore the concept of synchronization
- To handle the process in distributed environment

UNIT - I: DISTRIBUTED COMPUTING SYSTEM

Evolution – Models – Popularity - Distributed Operating System – Issues – Distributed Computed Environment.

UNIT - II: MESSAGE PASSING

Features of a Good Message Passing – Issues- Synchronization – Buffering – Multidatagram Messages – Encoding and Decoding of Message Data – Process Addressing – Failure Handling – Group Communication.

UNIT III: REMOTE PROCEDURE CALL

The RPC Model – Transparency – Implementation – Stub – Messages – Marshaling - Server Management – Parameter Passing Semantics – Call Semantics – Communication protocols – Complicated – Client server Binding – Exception Handling – Security – Special types – Heterogeneous – Light Weight – Optimization

UNIT - IV: SYNCHRONIZATION

Clock Synchronization – How Computer Clocks Are Implemented- Drifting or Clocks - Clock Synchronization Issues - Clock Synchronization Algorithms - Mutual Exclusion – Centralized Approach- Distributed Approach Token-Passing Approach – Deadlock - Necessary Conditions for Deadlock - Deadlock Modeling - Handling Deadlocks In Distributed Systems

UNIT - V: PROCESS MANAGEMENT

Introduction - Process Migration- Desirable Features of a Good Process Migration Mechanism - Process Migration Mechanisms - Process Migration in Heterogeneous Systems - Advantages of Process Migration – Threads - Motivations for Using Threads - Models for Organizing Threads - Issues In Designing a Threads Package - Implementing a Threads Package – Case Study:Hadoop.

TEXT BOOK

1. Pradeep K. Sinha, "Distributed Operating System Concepts and Design ", PHI, New Delhi, 2007

REFERENCE

1. Andrew S Tanaenbaum, "Modern Operating System", PHI, New Delhi, 2001

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http://www.scribd.com/doc/198503016/Distributed-Operating-Systems
http://it-ebooks.info/book/635/
http://developer.yahoo.com/hadoop/tutorial/

Online Quiz

http://searchdatamanagement.techtarget.com/quiz/Quiz-Test-your-understanding-of-the-Hadoop-ecosystem

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TOTAL NUMBER OF QUESTIONS			4	4	4	4	4	20

0:3:40:60

ENTERPRISE JAVA PROGRAMMING

OBJECTIVES

- To expose the knowledge of MVC and Java server faces
- To provide the knowledge and skills required to develop web applications using the MVC framework provided by Apache Struts
- To Develop Enterprise web application using EJB.
- To understand and implement the object-relation mapping using Hibernate
- To explore the knowledge of Aspect Oriented Programming using Spring and Spring MVC.

UNIT - I: INTEGRATING SERVLETS AND JSP, JAVA SERVER FACES

JSP: Basics – Life cycle of JSP- Static and dynamic content- javaBeans components; Understanding the need for MVC: implementing MVC with request dispatcher, summarizing the MVC code, interpreting relative URL, three data sharing approaches; JSF: Basics, Framework roles, Simple JSF application, Life Cycle of JSF page, using core tags, using HTML Component tags, localized messages, Standard Converters and Validators.

UNIT- II: STRUTS FRAMEWORK

Introduction to Struts , Understanding Struts , Struts Flow Control Six Basic steps in using Struts, FormBeans, Forms, Using properties files, Advanced Action, Manual Validation, validation in the Action, validation in the form bean, Struts Tiles, Motivations , Basics, Tiles definitions file.

UNIT - III: ENTERPRISE JAVA BEANS

EJB: Session Bean, Entity Bean, Message driven Bean, defining clients access with interfaces, life cycle of enterprise Bean, creation of Enterprise Bean, web client, other Enterprise Bean features, handling exceptions, Container- Managed Transactions, Bean Managed Transactions.

UNIT - IV: HIBERNATE

Basics- Enterprise Application architectures, Hibernate Motivation, Object Relation Mapping, Collection Mapping, Association Mapping, Collection and Association Relationships, Relationships in Java and Databases, Component Mapping, Inheritance Mapping, Life cycle of Hibernate Entities, Transactions, HQL, Native SQL, Querying Terminology, SQL Query Options, Querying With Hibernate.

UNIT - V: SPRING

Foundation: Motivation- Spring Hello World, Runtime environment, Dependency injection-Inversion of control ,Spring IoC container, Spring framework composition, Spring container instantiation, Spring bean definitions ,Bean naming, Bean scoping, Referencing other beans, Properties integration-Resource integration - Collection mapping, AOP with spring framework.

TEXT BOOKS

1. Marty Hall, Larry Brown., "Core Servlets and Java Server Pages", 2nd Edition, Pearson Education, 2004

2. Stephanie Bodoffetl., "The J2EETM Tutorial", Pearson Education, Second Edition, 2005
3. Hibernate Reference Documentation 3.3.1, Copyright © 2004 Red Hat Middleware, LLC available at http://www.hibernate.org/hib_docs/v3/reference/en/html_single/
4. Gary Mak, Josh Long and Daniel Rubio, "Spring Recipes: A Problem-Solution Approach", Apress Publications, Second Edition, 2010
5. Craig Walls, "Spring in action", Manning Publisher, Third Edition, 2011

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2. Cay S.Horstmann, Gary Cornell, "Core Java Volume II – Advanced Features", Prentice Hall of India, Ninth Edition, 2013
3. Minter Dave, Linwood Jeff, "Beginning Hibernate, From Novice to Professional", Apress, Second Edition, 2006
4. Doray, Arnold, "Beginning Apache, From Novice to Professional", Apress, Second Edition, 2006

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http://docs.oracle.com/javaee/1.4/tutorial/doc/JSFIntro.html
http://docs.oracle.com/javaee/6/tutorial/doc/bnaph.html
http://en.wikipedia.org/wiki/JavaServer_Faces
http://docs.oracle.com/cd/E19879-01/819-3669/bnaph/index.html
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http://www.tutorialspoint.com/ejb/

Online Quiz

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http://www.javatpoint.com/

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C	**ANY THREE**	8	Theory	Theory or Program	Program	Program	Theory or Program	5
TOTAL NUMBER OF QUESTIONS			4	4	4	4	4	20

Semester - III   **4-1-0:3:40:60**

WEB APPLICATION USING ASP.NET

OBJECTIVES
- To understand the difference between desktop and dynamic web applications.
- To understand the ASP.NET web application execution model.
- To create and modify multi-page Web Form applications
- To demonstrate features like flow control,data access and data binding
- To validate forms with in an application.

UNIT- I: INTRODUCTION TO ASP.NET AND WEB FORMS
Developing ASP.NET Applications - ASP.NET File Types - The bin Directory - Application Updates - A Simple Application from Start to Finish-web.config file Web Form Fundamentals - A Simple Page Applet - The Problem With Response.Write - Server Controls - HTML Server Controls - ViewState - The HTML Control Classes - Events - Event Handling Changes - The Currency Converter application-Adding Support for Multiple Currencies - Adding Linked Images - Setting Styles – A Deeper Look at HTML control classes-HTML control events-The HTML control Base class-The HtmContainerControl Class-The HtmlInputControl Class-The Page class-The Controls collection-The HttpRequest Class-The HttpResponse Class-The ServerUtility Class-Assessing HTML Server controls

UNIT - II: WEB CONTROLS

Web Controls - Stepping Up to web Controls - Basic Web Control Classes - The web Control Tags - The WebControl Base Class - Units Enumerated Values - Colors - Fonts - List Controls - Table Controls - AutoPostBack and Web Control Events - How Postback Events Work - The Page Lifecycle - The Greeting Card Applet - Validation and rich Controls- The Calendar Control-Formatting the Calendar-restricting Dates- The AdRotator control-The Wizard control-Validation-The Validation Controls -The Validation Process-The Validator Class-A Simple Validation Example –Sever side example-Manual Validation- Understanding Regular Expressions-Literals and MetaCharacters-Finding a Regular expression- A Validated Customer Form

UNIT - III: COMPONENT BASED PROGRAMMING

Introduction – Creating a Simple Component – Properties and State – Database Components – Consuming the Database Component – Enhancing the Component with Error Handling – Aggregate Information – Data Objects.

UNIT - IV: CUSTOM CONTROLS

User Controls – Creating a Simple User Control – Visual Studio.NET Custom Control Support – Independent User Controls – Integrated User Controls – User Control Events – Limitations – Deriving Custom Controls.

UNIT - V: DATABASE ACCESS WITH COMMAND, ADAPTER AND XML

ADO.NET Data Access - About the ADO.NET Example - Obtaining the Sample Database - Simple Data Access - Simple Data Update - Importing the Namespaces - Creating a Connection - The Connection String SQL - Making the Connection - Defining the Select Command - Using a Command with a DataReader - Updating Data - Using Update - Insert - and Delete Commands - Accessing Disconnected Data - Selecting Disconnected Data - Selecting Multiple Tables - Modifying Disconnected Data - Modifying and Deleting Rows - Adding Information - to a DataSet - Updating Disconnected Data - The Command Builder - Updating a DataTable - Controlling Updates - An Update Example – Using XML - XML's Hidden Role in .NET - XML Basics - Attributes - Comments - The XML Classes - the XML TextWriter - The XML Text Reader - Working with XML Documents - Reading an XML Document - Searching an XML Document - XML Validation – CreatingXML Schema -XSD Documents - Validating an XML File.

TEXT BOOKS

1. Mathew MacDonald, "ASP.NET: The Complete Reference", Tata McGraw Hill Publishing Company Ltd., New Delhi, 2006
2. Dino Eesposito, "Introducing Microsoft ASP.NET 2.0", Asoke K.Ghosh, Prentice Hall of India, Eastern Economy Edition, New Delhi, 2006

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1. Stephen Walther,"ASP.NET 3.5 Unleashed", Pearson Education, Dorling Kindersley Pvt. Ltd, Second Edition, 2008

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TOTAL NUMBER OF QUESTIONS			4	4	4	4	4	20

PYTHON PROGRAMMING

OBJECTIVES

- To learn program and programming paradigms brought in by Python.
- To introduce Python objects, numbers and Strings.
- To focus on File Handling and Regular Expressions
- To understand the operators and dictionaries
- To handle the program errors and exceptions

UNIT - I: OVERVIEW

Introduction- What is Python- Origin- Comparison- Comments- Operators- Variables and Assignment- Numbers- Strings- Lists and Tuples- Dictionaries- if Statement- while Loop- for Loop and the range()Built-in Function- Files and the open()-Built-in Function- Errors and Exceptions- Functions- Classes- Modules Syntax and Style Statements and Syntax- Variable Assignment- Identifiers- Basic Style Guidelines- Memory Management- Python Application Examples

UNIT - II: OBJECTS AND NUMBERS

Python Objects- Standard Types- Other Built-in Types- Internal Types- Standard Type Operators- Standard Type Built-in Functions- Categorizing the Standard Types- Unsupported Types. Numbers and Strings. Introduction to Numbers- Integers- Floating Point Real Numbers- Complex Numbers- Operators- Built-in Functions.

UNIT - III: STRINGS, LISTS AND TUPLES

Sequence-Strings- Strings and Operators- String-only Operators- Built-in Functions- String Built-in Methods- Special Features of Strings- unicode- modules- lists: Operators- Built-in Functions- List Type Built-in Methods- Special Features of Lists- Tuples- Tuple Operators and Built-in Functions- Special Features of Tuples.

UNIT - IV: DICTIONARIES, LOOPS, FILES AND INPUT/OUTPUT

Dictionaries : Introduction to Dictionaries- Operators- Built-in Functions- Built-in Methods-Dictionary Keys- Conditionals and Loops: if statement- else Statement- elif Statement- while Statement- for Statement- break Statement- continue Statement- pass Statement- else Statement File Objects- File Built-in Function- File Built-in Methods- File Built-in Attributes-Standard Files- Command-line Arguments- File System- File Execution-Regular Expression-Introduction.

UNIT - V: EXCEPTIONS AND PARSING JSON

Exceptions in Python- Detecting and Handling Exceptions- Exceptions as Strings- Raising Exceptions- Assertions- Standard Exceptions. Programming Exercise: Check for data error in CSV files: Numeric Check- Alphanumeric Check- Email Check- Date Check. XML in Python-JSON in Python-Case study :SWIG.

TEXT BOOK

    1. Chun, J Wesley, Core Python Programming, 2nd Edition, Pearson, 2006.

    1. Chun, J Wesley, Core Python Programming, 3rd Edition, Pearson, 2012

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    1. Barry, Paul, Head First Python, 2nd Edition, O Rielly, 2010

    2. Lutz, Mark, Learning Python, 4th Edition, O Rielly, 2009

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    https://www.codecademy.com/learn/python

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TOTAL NUMBER OF QUESTIONS			4	4	4	4	4	20

ELECTIVE-II: a. OBJECT ORIENTED ANALYSIS AND DESIGN

OBJECTIVES

- To understand the fundamental concepts of UML diagrams.
- To draw diagrams with project documentation.
- To analyze the requirements given by stake holder
- To design the project with examples.
- To understand the Software Development Process

UNIT - I: INTRODUCTION

Object oriented development – Evidence for Usefulness of Object Oriented development - Modeling Concepts: Modeling – Abstraction - The Three Models.

UNIT - II: CLASS MODELING

Class Modeling: Object and Class Concepts – Link and Association Concepts -Inheritance - Sample Class Model - Navigation of Class Models – Advanced Class Modeling: Advanced Object & Class Concepts - Association Ends -N-ary Associations – Aggregation - Abstract Classes.

UNIT - III: DYNAMIC MODELING

State Modeling: Events – States – Transitions & Conditions - State diagrams - State Diagram Behavior - Interaction Modeling: Use Case Models - Sequence Models - Activity Models.

UNIT - IV: SYSTEM ANALYSIS

Process Overview: Development Stages - Development Life Cycle - Domain Analysis: Overview of Analysis - Domain Class Model - Domain State Model - Domain Interaction Model.

UNIT - V: SYSTEM DESIGN

System Design: Overview of System Design - Estimating performance - Making a Reuse plan - Breaking a System into Subsystems - Identifying Concurrency-Allocation of Subsystems - Management of Data Storage - Handling Global Resources - Choosing a Software Control Strategy.

TEXT BOOK

1. Michael Blaha and James Rumbaugh, "Object-Oriented Modeling and Design with UML", Prentice Hall of India Private Limited, New Delhi, 2005

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1. Ali Bahrami "Object-oriented Systems Development using UML", McGraw Hill, Boston, 1999
2. John W.Satzinger, Robert B.Jackson, Stephen D.Burd, "Object – Oriented Analysis and Design with Unified Process", Course Technology, New Delhi, 2005
3. L.Whitten, Lonne D.Bentley, "System Analysis and Design Methods", Tata McGraw Hill Publishing Company Ltd, Fourth Edition, New Delhi, 1999

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SOFTWARE TESTING AND QUALITY ASSURANCE

OBJECTIVES

- To introduce various approaches, techniques, technologies, and methodologies used in software testing and quality assurance.
- To understand the role of testing in applications
- To learn to design the test cases
- To know the different levels of testing
- To study the state-of-the-art of software testing and quality assurance.

UNIT I: TESTING BASICS

Testing as an engineering activity – Deming's Quality Principles- Testing as a process – introduction to SQA And SQC - Software testing principles – Life cycle of Testing - The tester's role – Origins of defects – Defect classes – The defect repository and test design – Developer / tester support for developing a defect repository – Life cycle of Defects – Introduction to Jira tool

UNIT II: TEST CASE DESIGN

Introduction to testing design strategies – Test case design strategies – Using black box approach to test case design – Random testing – Equivalence class partitioning – Boundary value analysis – Other black box test design approaches – Black box Testing and COTS – Using white box approach to test design – Test adequacy criteria –v&v test model - flow graphs –Case Study: Test case preparation.

UNIT III: LEVELS OF TESTING

Static Code Reviews –Unit test – Unit test planning – Designing the unit tests – The class as a testable unit – Running the unit tests and recording results - code coverage – Function coverage- code coverage tool for C++ Covtool – Introduction to EMMA – Dead code - Integration tests – Designing integration tests – Integration test planning – System test – The different types – Regression testing – Alpha, and beta tests.

UNIT IV: EXPLORATORY AND RISK BASED TESTING

Performance Testing – Memory leak – creation of memory leak programs - process leak – system crashes - exploratory testing – Risk based testing – Adhoc testing – User acceptance testing – Stress testing – Drivers and Stubs - Practical: Web stress tool -

UNIT V: FUNDAMENTALS OF SOFTWARE QUALITY & ASSURANCE

Software quality per Juran and Deming - Hierarchical models of Boehm and McCall - Measuring Software Quality - Gilb's approach - GQM Model-Quality tasks - SQA plan - Characteristics - Implementation - Documentation - Reviews and audits. Case Study: SQA Plan. CASE STUDY: Tools for quality - Ishikawa's basic tools - CASE tools

TEXT BOOKS

1. Roger S. Pressman, "Software Engineering: A Practitioner's Approach", Seventh Edition. McGrawHill, 2010.
2. Ilene Burnstein, "Practical Software Testing", Springer International Edition, 2003

3. Allan C. Gillies, "Software Quality: Theory and Management", Thomson Learning, 2003.

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1. Elfriede Dustin, "Effective Software Testing", Pearson Education, 2003.
2. RenuRajani and Pradeep Oak, "Software Testing – Effective Methods, Tools and Techniques", Tata McGraw Hill, 2003.
3. Mordechai Ben, Menachem and Garry S.Marliss, "Software Quality", Thomson Asia Pvt. Ltd., 2003.
4. Kamna Malik and Praveen Choudry, "Software Quality: A Practitioner Approach", PHI, 2000.

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ELECTIVE-II: c. SOFTWARE PROJECT MANAGEMENT

OBJECTIVES
- To provide sound knowledge in Project Management.
- To understand the importance of requirement gathering
- To explore different models in Software Development
- To know the workflow of a Project
- To identify various actors in the activity

UNIT I: INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT

Introduction: Project – Software Projects vs other types of Project – Activities Covered by SPM – Some Ways of Categorizing Software Projects – Stakeholders, Setting Objectives – The Business Case - Project Success and Failure - Management and Management Control. Project Evaluation: A Business Case – Project Portfolio Management – Evaluation of Individual Projects – Cost Benefit Evaluation – Risk Evaluation.

UNIT II: PROJECT PLANNING AND SELECTION OF PROJECT APPROACH

Project Planning - Introduction to Step Wise Project Planning – Step 0 to Step 10. Selection of an Appropriate Project Approach - Introduction – Build or Buy – Choosing Methodologies and Technologies – Software Processes and Process Models – Choice of Process Models – The Waterfall Model– Prototyping – other ways of categorizing prototype- Agile Methods – Extreme Programming - Selecting the Most Appropriate Process Model.

UNIT III: EFFORT ESTIMATION AND ACTIVITY PLANNING

Effort Estimation – Introduction –Estimates – Problems with Over and Under-estimate – Basis for Software Estimating – Effort Estimation Techniques – Bottom-up Estimating – Top-down Approach and Parametric Models – Expert Judgment - Estimating by Analogy – Albrecht Function Point Analysis – Function Mark II – COCOMO & COCOMO II – Cost Estimation – Staffing Pattern. Activity Planning – Introduction – Objectives of Activity Planning – When to plan – Project Schedules – Project and Activities – Sequencing and Scheduling Activities – Networking Planning Models – Formulating a Network Model– Activity on Arrow Networks.

UNIT IV: RISK MANAGEMENT, RESOURCE ALLOCATION AND MONITORING

Risk Management – Risk – Categories of Risk – A Framework for Dealing with Risk – Risk Identification – Risk Assessment – Risk Planning – Risk Management. Resource Allocation –Introduction – The Nature of Resources – Identifying Resource Requirements – Scheduling Resources. Monitoring – Creating the Framework – Collecting the Data – Review and Project Termination Review – Visualizing Progress – Cost Monitoring and Earned Value Analysis – Getting the Project Back to Target – Change Control – SCM.

UNIT V: MANAGING PEOPLE AND WORKING IN TEAMS

Managing People – Understanding Behavior – Organizational Behavior – Selecting the Right Person for the Job – Instruction in the Best Methods – Motivation – The Oldham-Hackman Job Characteristics Model – Stress – Health and Safety. Working in Teams – Introduction – Becoming a Team – Decision Making – Organization and Team Structures – Coordination Dependencies – Dispersed and Virtual Teams – Communication Genres – Communication Plans – Leadership.

TEXT BOOK

1. BOB Huges, Mike Cotterell, Rajib Mall "Software Project Management", McGraw Hill, Fifth Edition,2011.

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1. Futrell, "Quality software Project management", Pearson Education India.
2. Royce, "Software Project Management", Pearson Education India.

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TOTAL NUMBER OF QUESTIONS			4	4	4	4	4	20

PRACTICAL - IV: ENTERPRISE JAVA PROGRAMMING

1. JSP and MVC with Request Dispatcher

2. JSF in JSP Pages,Using all HTML and core render kit

3. Actions and Forms

4. Properties and Messages

5. Creating Web Client and Session Bean

6. Bean Managed Transactions and Container Managed Transaction

7. Object Relation Mapping and Collection Mapping

8. Association Mapping and Component Mapping

9. Inheritance Mapping

10. Spring Actions and Spring MVC

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B (Exercise 6 – 10)	**EITHER OR TYPE**	25	1 Pair
TOTAL NUMBER OF QUESTIONS			2

PRACTICAL - VII: WEB APPLICATION USING ASP.NET

1. Web Configuration File

2. HTML Control Classes, Control Events, Container and Input Control Classes,

3. HTTP Request Classes & Response Classes

4. Web Control Classes & Control Tags

5. Validation Controls

6. Rich Controls

7. Data Access

8. Components

9. Custom Controls

10. User Controls

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