SREE VIDYANIKETHAN ENGINEERING COLLEGE
(AUTONOMOUS)
Sree Sainath Nagar, Tirupati

Department of Information Technology

Supporting Document for 1.1.2

Syllabus Revision carried out in 2019

Program: M.Tech.- Software Engineering

Regulations : SVEC-19

This document details the following:

1. Courses where syllabus has been changed 20% and more.
2. Course-wise revised syllabus with changes highlighted.

Note: *For SVEC-19 revised syllabus, SVEC-16 (previous syllabus) is the reference.*

List of Courses where syllabus has been changed (20% and more)

Course Code	Name of the course	Percentage of Syllabus changed	Page Number in which Details are Highlighted
19MT12501	Advanced Software Engineering	100	3
19MT12503	Mobile Application Development	100	4
19MT12504	Information Retrieval Systems	100	5
19MT12505	Python Programming	100	6
19MT12506	User Interface Design	100	8
19MT12508	Information Security	100	10
19MT12531	Advanced Software Engineering Lab	30	11
19MT12532	Mobile Application Development Lab	100	15
19MT22501	Full Stack Technologies	100	16
19MT22503	Advanced Databases	100	17
19MT22504	.Net Technologies	100	18
19MT22506	Software Quality Assurance	100	20
19MT22531	Full Stack Technologies Lab	100	22
19MT22532	Software Architecture and Design Patterns Lab	100	25
	Average	**95**	
	Total No. of Courses in the Program	28	
	No. of Courses where syllabus (more than 20%) has been changed	14	
	Percentage of Syllabus changed in the Program	**47.5**	

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PRINCIPAL

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Department of Information Technology

M.Tech. I Semester
(19MT12501) ADVANCED SOFTWARE ENGINEERING
(Software Engineering)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	3	-	-	3

PREREQUISITES: Nil

COURSE DESCRIPTION: Software Life Cycle Models; Software Project Management; Software Design, Software Reliability And Software Quality Management; Software Maintenance, Software Reuse And Emerging Trends In Software; Devops.

COURSE OUTCOMES:

After successful completion of this course, the student will be able to:

- CO1: Use various Software Development Lifecycle Models in software development.
- CO2: Identify project management approaches as well as cost and schedule estimation strategies for quality software development.
- CO3: Apply software design approaches for development of software system.
- CO4: Understand software reliability, quality, reuse, and maintenance concepts.
- CO5: Choose DevOps Tools to accelerate software development and reduce defects.

DETAILED SYLLABUS:

UNIT-I: SOFTWARE LIFE CYCLE MODELS
Software Development Projects, Exploratory Style of Software Development, Emergence of Software Engineering, Notable Changes in Software Development Practices, Waterfall Model and its Extensions, Rapid Application Development, Agile Development Models, Spiral Model.

UNIT II: SOFTWARE PROJECT MANAGEMENT
Software Project Management Complexities, Responsibilities of a Software Project Manager, Project Planning. Metrics for Project Size Estimation, Project Estimation Techniques, Empirical Estimation Techniques, COCOMO, Halstead's Software Science—An Analytical Technique, Staffing Level Estimation, Scheduling, Organisation and Team Structures, Staffing, Software Configuration Management, Miscellaneous Plans.

UNIT III: SOFTWARE DESIGN, RELIABILITY AND QUALITY MANAGEMENT
Overview of the Design Process, Good Software Design, Cohesion and Coupling, Layered Arrangement of Modules, Approaches to Software Design, Software Reliability, Statistical Testing, Software Quality, Software Quality Management System, ISO 9000, SEI Capability Maturity Model, Six Sigma.

UNIT IV: SOFTWARE MAINTAINANCE, REUSE AND EMERGING TRENDS

Maintenance: Characteristics of Software Maintenance, Software Reverse Engineering, Software Maintenance Process Model, Estimation of Maintenance Cost.
Reuse: Need of Reuse, Basic Issues in any Reuse Program, A Reuse Approach, Reuse at Organization Level.

Emerging Trends: Client-Server Software, Client-server Architectures, CORBA, COM/DCOM, Service-Oriented Architecture, Software as a Service.

UNIT V: DevOps
DevOPs: Cloud as a Platform, Deployment Pipeline-Architecture, Building and Testing, Deployment, Case study- Supporting Multiple Datacenters.

TEXT BOOKS:

1. Rajib Mall, "*Fundamentals of Software Engineering*", 4th Edition, PHI, 2014.
2. Len Bass, Ingo Weber, Liming Zhu, "*DevOps: A Software Architect's Perspective*", 1st Edition, Pearson Education. 2016.

REFERENCE BOOKS:

1. Roger S. Pressman, "*Software Engineering*", 6th Edition, McGraw Hill, 2005.
2. Carlo Ghezzi, Mehdi Jazayeri, and Dino Madrioli, "Fundamentals of Software Engineering", 2nd Edition, PHI Learning, 2010.

Department of Information Technology

M.Tech. I Semester
(19MT12503) MOBILE APPLICATION DEVELOPMENT
(Software Engineering)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	3	-	-	3

PRE-REQUISITES: Courses on "Java Programming".

COURSE DESCRIPTION: Introduction to Android Platform; Activities; Basic Views; Understanding the Components of a Mobile Screen; Display Orientations; Menus; File Storage; Database Storage; SMS; e-mail; Location-Based Services; Web Services using HTTP; Android Services; Communication between a Service and an Activity; Threading; Introduction to iOS.

COURSE OUTCOMES:

After successful completion of this course, the students will be able to:

CO1. Understand the programming concepts of Android and iOS for the development of mobile applications.

CO2. Analyze the states of Android activities, activity navigations, and screen orientations.

CO3. Design user interface for mobile applications using views and develop Android code to process the user data, exchange the data between activities and provide navigation among activities.

CO4. Apply Android programming principles to create files and databases for storing and retrieving of the user data.

CO5. Apply Android programming principles of messaging, location-based services (LBS), and networking to develop mobile applications like SMS, e-Mail, LBS, and web services.

DETAILED SYLLABUS:

UNIT - I: INTRODUCTION TO ANDROID PROGRAMMING

Introduction, Android versions, features of Android, architecture of Android, Required tools, launching of simple Android application, understanding activities, linking activities using intents, fragments.

UNIT - II: ANDROID USER INTERFACE

Understanding the components of a screen, adapting to display orientation, managing changes to screen orientation, utilizing the action bar, creating the user interface programmatically, listening for UI notifications.

UNIT - III: USER INTERFACE DESIGN WITH VIEWS

Basic views, picker views, list views, image views, menus with views, web view, saving and loading user preferences, persisting data to files, creating and using databases.

UNIT - IV: MESSAGING, LOCATION-BASED SERVICES, AND NETWORKING

SMS messaging, sending e-mail, displaying maps, getting location data, monitoring a Location, consuming web services using HTTP.

UNIT - V: ANDROID SERVICES AND iOS

Creation of Android services, communication between a service and an activity, binding activities to services, understanding threading.

iOS Tools, iOS project, debugging iOS apps, objective-C basics, Hello World app, building the derby app in iOS.

TEXT BOOKS:

1. J. F. DiMarzio, *"Beginning Android Programming with Android Studio"*, Wiley India, Fourth Edition, 2017.
2. Jeff McWherter, Scott Gowell, *"Professional Mobile Application Development"*, Wiley India, First Edition, 2012.

REFERENCE BOOKS:

1. Neils Smyth *"Android Stduio Development Essentials"*. Creative Space Independent publishing platform, Seventh edition 2016.
2. Paul Deital and Harvey Deital, *"Android How to Program"*,Detial associates publishers, First Edition, 2013.

Department of Information Technology

M.Tech. I Semester
(19MT12504) INFORMATION RETRIEVAL SYSTEMS
Program Elective-I
(Software Engineering)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	3			3

PREREQUISITES: A course on Database Management Systems

COURSE DESCRIPTION: Architecture of Information Retrieval Systems; Functional Capabilities; Data Structures; Mathematical Algorithms; Indexing; Similarity and Clustering; Human Perception and Presentation; Text Search Techniques and Evaluation Measures.

COURSE OUTCOMES:

After successful completion of this course, the students will be able to:

- **CO1:** Demonstrate knowledge on different information retrieval techniques.
- **CO2:** Use different indexing and data presentation methods.
- **CO3:** Analyze clustering algorithms to group similar data items and text search techniques for efficient search.
- **CO4:** Demonstrate Human Perception and Presentation Technicues in information retrieval.
- **CO5:** Choose different search and evaluation methods for information retrieval mechanism.

DETAILED SYLLABUS:

UNIT - I: INTRODUCTION
Primary Information Retrieval Problems, Objectives of Information Retrieval System, Functional Overview, Understanding the Search Functions, Relationship to DBMS, Digital libraries and Data Warehouses, Data structures and Mathematical Algorithms.

UNIT - II: INGEST AND INDEXING
Introduction. Item Receipt. Duplicate Detection. Item Normalization. Zoning and Creation of Processing Tokens, Stemming, Entity Processing, Categorization, Citational Metadata, Manual Indexing Process, Automatic Indexing of Text and Multimedia.

UNIT - III: SEARCH AND CLUSTERING
Similarity measures and Ranking. Hidden Markov Models Techniques, Ranking Algorithms, Relevance Feedback, Selective Dissemination of Information Search, Weighted Searches for Boolean Systems. Multimedia Searching. Introduction to Clustering, Thesaurus Generation, Item Clustering, Hierarchy of Clusters.

UNIT - IV: INFORMATION PRESENTATION
Introduction, Presentation of the Hits, Display of the Item, Collaborative Filtering, Multimedia Presentation, Human Perception and Presentation.

UNIT - V: SEARCH ARCHITECTURE AND EVALUATION
Index Search Optimization, Text Search Optimization, GOOGLE Scalable multiprocessor architecture, Information System Evaluation, Measures used in system evaluation

TEXT BOOK:

1. Gerald Kowalski, "Information Retrieval Architecture and Algorithms," Springer, First Edition, 2013.

REFERENCE BOOKS:

2. Christopher D. Manning, Prabhakar Raghavan, Hinrich Schütze, *"An Introduction to Information Retrieval,"* Cambridge University Press, First Edition, 2012.
3. Ricardo Baeza-Yates and Berthier Ribiero-Neto. *"Modern Information Retrieval the concepts and technology behind search,"* Addison Wesley, Second Edition, 2010

Department of Information Technology

M.Tech. I Semester
(19NT12505) PYTHON PROGRAMMING
Program Elective-I
(Software Engineering)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	3	-	-	3

PRE-REQUISITES: --Nil--

COURSE DESCRIPTION: Visual Programming through Scratch; Introduction to Python Programming and Control Structures: Python Data Structures. Strings. Functions and Files; Introduction to Object Oriented Programming and Python modules.

COURSE OUTCOMES:

After successful completion of the course, the student will be able to:

- **CO1:** Understand the basic concepts of visual programming through Scratch tool and Python variables, operators, control structures, data structures, strings, functions and files.
- **CO2:** Develop basic scripts for performing Input, Output and Computations using Scratch tool and Python programming.
- **CO3:** Identify the strengths and weaknesses of different Scratch Palettes and Python data structures.
- **CO4:** Design and deploy appropriate data structures, string functions and Python modules for solving computing problems.
- **CO5:** Develop Python Programs for solving real time applications using object oriented concepts and Python modules.

DETAILED SYLLABUS:

UNIT I – VISUAL PROGRAMMING THROUGH SCRATCH

Scratch: Scratch Programming Environment, Paint Editor, First Scratch Game, Scratch Blocks, Arithmetic Operators and Functions; Motion and Drawing- Motion Commands, Pen Commands. The Power of Repeat: Looks and Sound- The Looks Palette. The Sound Palette; Procedures- Message Broadcasting and Receiving. Creating Large Programs in Small Steps, Working with Procedures: Variables- Data Types in Scratch, Introduction to Variables, Variable Monitors in Applications, Getting Input from Users, Making Decisions- Comparison Operators, Decision Structures, Logical Operators; Repetition- Loop Blocks, Stop Commands, Counters.

UNIT II – INTRODUCTION TO PYTHON PROGRAMMING AND CONTROL STRUCTURES

Introduction: The Python programming language, First program in Python, Literals, Variables and Identifiers, Operators, Expressions, Case study on Restaurant Tab Calculation.

Control Structures: Control structures, Boolean expressions, Selection control and Iterative control, importing modules.

UNIT III – PYTHON DATA STRUCTURES

Lists: Numbers, List structures, Lists in Python, Iterations over lists, Assigning and copying lists, List comprehensions, Case studies-Chinese Zodia and Password Encryption/Decryption,

Dictionaries, Tuples and Sets: Dictionary types in Python, Implementation of Dictionary, Tuples, Set data type - the Set data type in Python.

UNIT IV – STRINGS, FUNCTIONS AND FILES

Strings: String Processing- String Traversal, String-Applicable Sequence Operations and String Methods.

Functions: Program Routines, More on Functions, Case Studies-Temperature Conversion and Credit Card Calculation.

Files: Text File, Opening Text Files, Reading and Writing Text Files.

UNIT V –OBJECT ORIENTED PROGRAMMING AND PYTHON MODULES

Introduction to Object Oriented Programming: Object-oriented programming, User-definec compound data types, Attributes, Methods, Instances as arguments, parameters and return values, PyGame.

Python Modules: Numpy, Pandas, Openpyxl, PyPDF2 and CSV.

TEXT BOOKS:

1. Focus Charles Dierbach, *"Introduction to Computer Science using Python: A Computational Problem Solving"*, Wiley India Edition, 2016.
2. Games, Art, Science, and Math, Majed Marji, *"Learn to Program with Scratch: A Visual Introduction to Programming"* No Starch Press, Inc., 2014.

REFERENCE BOOKS:

1. Peter Wentworth, Jeffrey Elkner, Allen B. Downey and Chris Meyers, "How to Think Like a Computer Scientist: Learning with Python-3 Documentation", 3rd Edition, 2012, "Numpy and Pandas Tutorial",.
2. Automate the Boring Stuff with Python, Al Sweigart, No Starch Press, Inc., 2014.
3. "Learn to Program with Scratch", https://nostarch.com/learnscratch/#content.
4. Fundamentals of Python, Kenneth Lambert and B.L Juneja, , Cengage Learning, 3rd Edition, 2012.

M.Tech. I Semester
(19MT12506) USER INTERFACE DESIGN
(Software Engineering)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	3	-	-	3

PREREQUISITES: A course on "Advanced Software Engineering"

COURSE DESCRIPTION: Characteristics & principles of User Interface Design; Requirement analysis-direct & indirect methods; Design- using Formatting menus & Windows; Design-using Text boxes, multimedia and Windows layout.

COURSE OUTCOMES:

After successful completion of this course, the student will be able to:

- CO1: Gain the knowledge on concepts of user interfaces and related business functions.
- CO2: Analyze user requirements necessary for UI development.
- CO3: Design interfaces using appropriate menus, windows, interfaces.
- CO4: Usage and customize of advanced tools for various window layouts in project management and development of UI computing systems.

UNIT I: FOUNDATIONS OF HCI

The Human: I/O channels – Memory – Reasoning and problem solving; The Computer: Devices – Memory – processing and networks; Interaction: Models – frameworks – Ergonomics - styles – elements – interactivity- Paradigms. – Case Studies

UNIT II: DESIGN & SOFTWARE PROCESS

Interactive Design: Basics – process – scenarios – navigation – screen design – Iteration and prototyping. HCI in software process: Software life cycle – usability engineering – Prototyping in practice – design rationale. Design rules: principles, standards, guidelines, rules. Evaluation Techniques – Universal Design

UNIT III: MODELS AND THEORIES

HCI Models: Cognitive models: Socio-Organizational issues and stakeholder requirements –Communication and collaboration models-Hypertext, Multimedia and WWW.

UNIT IV: MOBILE HCI

Mobile Ecosystem: Platforms, Application frameworks- Types of Mobile Applications: Widgets, Applications, Games- Mobile Information Architecture, Mobile 2.0, Mobile Design: Elements of Mobile Design, Tools. – Case Studies.

UNIT V: WEB INTERFACE DESIGN

Designing Web Interfaces – Drag & Drop, Direct Selection, Contextual Tools, Overlays, Inlays and Virtual Pages, Process Flow – Case Studies

TEXT BOOKS:

1. Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale, "*Human Computer Interaction*", 3rd Edition, Pearson Education, 2004 (UNIT I , II & III).
2. Brian Fling, "*Mobile Design and Development*", First Edition, O'Reilly Media Inc., 2009 (UNIT –IV).
3. Bil Scott and Theresa Neil, "*Designing Web Interfaces*", First Edition, O'Reilly, 2009. (UNIT-V).

REFERENCE BOOK:

1. Alan Cooper, "*The Essential of User Interface Design*", Wiley – Dream Tech Ltd.,2002.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)
Department of Information Technology

M.Tech. (SE) I Semester
(16MT12509) USER INTERFACE DESIGN
(PROFESSIONAL ELECTIVE-I)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	4	-	-	4

PREREQUISITES: A course on "Software Development Methodologies"

COURSE DESCRIPTION: Characteristics & principles of User Interface Design; Requirement analysis-direct & indirect methods; Design- using Formatting menus & windows; Design-using Text boxes, multimedia and Windows layout.

COURSE OUTCOMES:

On successful completion of this course, the students will be able to:

1. Gain the knowledge on concepts of user interfaces and related business functions.
2. Analyze user requirements necessary for UI development.
3. Design interfaces using appropriate menus, windows, interfaces.
4. Solve real world problems by applying theoretical user interface concepts.
5. Usage and customize of advanced tools for various window layouts in project management and development of UI computing systems.

UNIT-I: INTRODUCTION **(Periods: 09)**

Human–Computer Interface – Characteristics of Graphics Interface –Direct Manipulation Graphical System – Web User Interface –Popularity –Characteristic & Principles- User Interface Design Process – Obstacles -Usability

UNIT-II: HUMAN COMPUTER INTERACTION **(Periods: 12)**

Human Characteristics In Design – Human Interaction Speed –Business Functions – Requirement Analysis – Direct –Indirect Methods – Basic Business Functions – Design Standards – System Timings –Human Consideration In Screen Design – Structures of Menus – Functions of Menus–Contents of Menu

UNIT-III: FORMATTING MENUS AND WINDOWS **(Periods: 09)**

Formatting – Phrasing the Menu – Selecting Menu Choice–Navigating Menus– Graphical Menus.

Windows: Characteristics– Components– Presentation Styles– Types– Managements– Organizations– Operations– Web Systems– Device– Based Controls Characteristics– Screen – Based Controls – Operate Control.

UNIT-IV: TEXT BOXES AND MULTIMEDIA **(Periods: 11)**

Text Boxes– Selection Control–Combination Control– Custom Control– Presentation Control Text for Web Pages – Effective Feedback– Guidance & Assistance–Internationalization– Accessibility– Icons– Image– Multimedia – Coloring.

UNIT-V: WINDOWS LAYOUT **(Periods: 09)**

Prototypes – Kinds of Tests – Retest – Information Search – Visualization –Hypermedia – WWW– Software Tools.

[Total Periods: 50]

TEXT BOOKS:

1. Wilbent. O. Galitz, *"The Essential Guide To User Interface Design"*, John Wiley& Sons, 2001.
2. Ben Sheiderman, *"Design the User Interface", Pearson Education*, 1998.

REFERENCE BOOK:

1. Alan Cooper, *"The Essential Of User Interface Design"*, Wiley – Dream Tech Ltd., 2002.

M.Tech. I Semester
(19MT12508) Information Security
(Software Engineering)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	3	-	-	3

PREREQUISITES: -

COURSE DESCRIPTION:

Introduction to Security; Need for Security; Risk Management; Planning for Security; Security Technology

COURSE OUTCOMES:

After successful completion of this course, the students will be able to:

- CO1: Understand the basics of Information Security
- CO2: Demonstrate the reasons for security issues.
- CO3: Understand and manage risks.
- CO4: Gain knowledge on security standards.
- CO5: Understand the role of access control systems and security systems.

DETAILED SYLLABUS

UNIT-I: *INTRODUCTION*

History, Security Concepts, Critical Characteristics of Information, CNSS Security Model, Components of an Information System, Balancing Security and Access, The SDLC, The Security SDLC.

UNIT II: *NEED FOR SECURITY*

Business Needs, Threats, Attacks - Malicious Code, Hoaxes, Doors, Password Crack, Brute Force, Dictionary, Denial-of-Service (DoS) and Distributed Denial-of-Service (DDoS), Spoofing, Man-in-the-Middle, Spam, Mail Bombing, Sniffers, Social Engineering, Pharming, Timing Attack; Secure Software Development

UNIT III: *RISK MANAGEMENT*

Risk Identification, Risk Assessment, Risk Control Strategies, Selecting a Risk Control Strategy, Quantitative Vs Qualitative risk Control Practices.

UNIT IV: PLANNING FOR SECURITY

Information Security Planning and Governance; Information Security Policy, Standards and Practices; Information security Blueprint; Security Education, Training and Awareness Program; continuity Strategies.

UNIT V: SECURITY TECHNOLOGY

Access Control, Firewalls, Intrusion Detection and Prevention Systems; Honeypots, Honeynets, and Padded Cell Systems; Scanning and Analysis Tools; Biometric Access Controls.

TEXT BOOK:

1. Michael E Whitman and Herbert J Mattord, "*Principles of Information Security*", 6th Edition, Course Technology Press, Boston, US 2018

REFERENCES

1. Micki Krause, Harold F. Tipton, "*Handbook of Information Security Management*", 6th Edition, Auerbach Publications, 2013.

M.Tech. I Semester

(19MT12531) ADVANCED SOFTWARE ENGINEERING LAB

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
50	50	100	-	-	4	2

PREREQUISITES: Courses on "Advanced Software Engineering", and "Data Structures and Algorithms".

COURSE DESCRIPTION: Software development life cycle activities- requirements specification using open source Requirement documentation tool, modeling using AgroUML tool; Raptor-Flowchart based programming tool; Marathon IDE; Jenkins and Apache Jmeter tools; Project Management Web application using Redmine; JIRA and Scala Oriented Build tools; Implementation of various linear and non-linear data structures using C++; MIT app Inventor and Thingspeak Cloud.

COURSE OUTCOMES:

After successful completion of this course, the students will be able to:

CO1: Demonstrate hands-on experience on:

- Requirements Engineering and Management
- Estimation of software-size, effort, schedule and cost.

CO2: Design and Develop basic flowcharts and programs for performing Input, Output and Computations using Agro UML, Raptor tools, Marathon IDE and C++ concepts.

CO3: Identify and apply designing, estimating tools and methodologies for complex engineering problems.

CO4: Develop mobile applications for solving real time applications using MIT app Inventor and Thingspeak Cloud.

CO5: Work individually and in teams collaboratively in implementing mini projects.

CO6: Demonstrate communication skills both oral and written for preparing and presenting reports.

CO7: Engage in life-long learning and enthusiasm to upgrade knowledge and skills in latest technologies and tools.

LIST OF EXERCISES:

1. Prepare the Software Requirement Specification (SRS), High Level Design (HLD) and Detailed Design (DD) for the following experiments

   (i) Online Job Portal (ii) E-Voting System

   Note: For the reference of SRS, HLD and DD templates refer department manual and use any open source Requirement documentation tool.

2. Estimate project parameters such as size, effort and time for development for a Library Information system using Basic COCOMO model.

3. Model UML Use case, Sequence, Collaboration and Component diagrams for the following experiments using Argo UML tool (i) Online Job Portal (ii) E-Voting System.
4. Study and prepare a report on the following tools:

   (i) Raptor-Flowchart based programming tool

   (ii) Marathon IDE.
5. Study and prepare a report on

   (i) Jenkins tool

   (ii) Apache Jmeter
6. Create any project management web application using Redmine Open source tool.
7. Consider any one mobile application and track the issues and bugs related to it using JIRA tool.
8. Develop a Scala application using Scala oriented Build Tool (SBT).
9. Write C++ program to implement the operations of doubly linked list.
10. Write a C++ program to perform the following operations of BST:

    a) Node Insertion b) Node Deletion c) Key Search
11. Write C++ program for implementing the following search and sorting techniques.

    a) Binary search b) Fibonacci Search c) Quick Sort d) Shell Sort
12. Write C++ program to construct the Minimum Cost Spanning Tree using Kruskal's algorithm.
13. Write a C++ program to implement 0/1 Knapsack problem.
14. Mini Projects (MPs):

    Form a group of maximum 3 members as a team and assign mini projects related to mobile and IoT based applications using MIT app Inventor and Thingspeak Cloud.

REFERENCE BOOKS:

1. Roger S. Pressman, "*Software Engineering, A practitioner's Approach,*" 6th Edition, Tata McGraw-Hill, Edition, 2010.
2. Sommerville, "*Software Engineering,*" 8th Edition, Pearson Education, 2007.
3. Rajesh Naik and Swapna Kishore, "*Software Requirements and Estimation,*" Tata McGraw Hill, New Delhi, 2001.
4. "Estimation of Project Estimation and Metrics," http://vlssit.iitkgp.ernet.in/isad/isad/2/.
5. "Marathon IDE", https://marathontesting.com/

M.Tech. (SE) I Semester
(16MT12531) ADVANCED SOFTWARE ENGINEERING LAB-1

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
50	50	100	-	-	4	2

PREREQUISITES: Courses on "Software Development Methodologies", "Software Requirements and Estimation", Data Structures and Algorithms" and "Object Oriented Analysis & Design"

COURSE DESCRIPTION: Software development life cycle activities- requirements specification using open source Requirement documentation tool, modeling using AgroUML tool; Implementation of various linear and non-linear data structures using C++; Refactoring using InsRefactor and SafeRefactor Eclipse Plugins.

COURSE OUTCOMES:

On successful completion of this course, the students will be able to:

1. Demonstrate hands-on experience on:
   - Requirements Engineering and Management
   - Estimation of software-size, effort, schedule and cost.
2. Identify key entities and relationships in the problem domain and write succinct textual descriptions of problems, modeling and Implement linear and non-linear data structures using C++.
3. Identify and apply designing, estimating tools and methodologies for complex engineering problems.
4. Apply algorithm design approaches and C++ programming skills to solve real world applications.
5. Work individually and in teams collaboratively in implementing mini projects.
6. Demonstrate communication skills both oral and written for preparing and presenting reports.
7. Engage in life-long learning and enthusiasm to upgrade knowledge and skills in latest technologies and tools.

LIST OF EXERCISES:

1. Prepare the Software Requirement Specification (SRS), High Level Design (HLD) and Detailed Design (DD) for the following experiments

   (I) Employee Information System (II) Online Airline Reservation

   Note: For the reference of SRS, HLD and DD templates refer department manual and use any open source Requirement documentation tool.
2. Estimate project parameters such as size, effort and time for development for a Library Information system using Basic COCOMO model.
3. Model UML Use case, Sequence, Collaboration and Component diagrams for the following experiments using Argo UML tool (i) Students Marks Analyzing System (ii) Course Registration System.

4. Study and prepare a report on the following tools: (i) Raptor-Flowchart based programming tool (ii) Microsoft Visio 2010 (iii) Jenkins tool.
5. Write C++ program to implement the following data structures using a singly linked list.

   a) Stack b) Queue
6. Write C++ program to implement the operations of doubly linked list.
7. Write a C++ program to perform the following operations of BST:

   a) Node Insertion b) Node Deletion c) Key Search
8. Write C++ program to traverse the given binary tree in Pre-order, In-order and Post-order using recursion.
9. Write C++ program for the implementing BFS and DFS graph traversal techniques using queue and stack data structures.
10. Write C++ program for implementing the following search and sorting techniques.

    a) Binary search b) Fibonacci Search c) Quick Sort d) Shell Sort
11. Write C++ program to construct the Minimum Cost Spanning Tree using Kruskal's algorithm.
12. Write a C++ program to implement 0/1 Knapsack problem.
13. Mini Project on any web based application using Refactoring

    Note: Use InsRefactor and SafeRefactor Eclipse Plugins for refactoring

REFERENCE BOOKS:

1. Roger S. Pressman, "*Software Engineering, A practitioner's Approach*," 6th Edition, Tata McGraw-Hill, Edition, 2010.
2. Sommerville. "*Software Engineering*." 8th Edition. Pearson Education. 2007.
3. Rajesh Naik and Swapna Kishore, "Software Requirements and Estimation," Tata McGraw Hill, New Delhi, 2001.
4. Sartaj Sahni "*Data structures, Algorithms and Applications in C++*," 2nd Edition, Universities press (India) Pvt. Ltd, 2005.
5. Adam Drozdek "*Data Structures and Algorithms in C++*," 4th Edition, Delmar Cengage Learning, 2012.
6. "*Estimation of Project Metrics*," http://vlssit.iitkgp.ernet.in/isad/isad/2/, drafted on July 01, 2016 at 11:30 AM.

SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)

Department of Information Technology

M.Tech. I Semester

(19MT12532) MOBILE APPLICATION DEVELOPMENT LAB

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
50	50	100	-	-	4	2

PRE-REQUISITES: Course on Mobile Application Development

COURSE DESCRIPTION: Hands-on experience on development of Android Mobile applications using Views; Menus; Layouts; Buttons; Date Picker, and database creation and access with Android SQLite.

COURSE OUTCOMES:

After successful completion of this course, the students will be able to:

- **CO1:** Demonstrate programming skills for the development of mobile applications using Android platform.
- **CO2:** Analyze the requirements of the user to develop Android applications.
- **CO3:** Design user interface for mobile applicatons using views and develop Android applications based on user requirements.
- **CO4:** Apply Android programming principles to create files and databases for storing and retrieving of the user data.
- **CO5:** Apply Android programming principles of messaging, location-based services (LBS), and networking to develop mobile applications like SMS, e-Mail, LBS, and web services.
- **CO6:** Work effectively as an individual and as a member in team for mini-project implementation.
- **CO7:** Demonstrate communication skills, both oral and written for preparing and presenting reports.

List of Experiments:

1. Test an Android development environment by performing the following:
   a. Developing a simple application using Android studio.
   b. Creating an Android Virtual Device (AVD).
   c. Running a sample application using Android Emulator.
2. Design an Android application that demonstrates the use of Relative Layout with different attributes.
3. Design an Android application that demonstrates the use of Linear Layout with different attributes.
4. Develop an Android application that displays the custom Button and to handle the onClick() event.
5. Design an Android application that shows the Table layout to display child View elements in rows and columns.
6. Design an Android application that displays the List view.
7. Develop an Android application that shows Sub menus.
8. Develop an Android application that shows Context menu (Floating List of Menu Items).
9. Develop an Android application that demonstrates the use of Time and Date pickers.
10. Develop an Android application to insert, delete, display, and update the employee details using SQLite database.
11. Design and develop an Android application for user sign-up and sign-in. Utilize SQLite database for storing user details.
12. Mini project.

REFERENCE BOOKS:

R1. J. F. DiMarzio, "*Beginning Android Programming with Android Studio*", Wiley India, Fourth Edition, 2017.
R2. Paul Deital and Harvey Deital, "*Android How to Program*",Detial associates publishers, First Edition, 2013.
R3. Neils Smyth "*Android Stduio Development Essentials*", Creative Space Independent publishing platform, Seventh edition 2016.
R4. Jeff McWherter, Scott Gowell, "*Professional Mobile Application Development*", Wiley India, First Edition, 2012.

M.Tech. II Semester

(19MT22501) Full Stack Technologies

(Software Engineering)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	3	-	-	3

PRE-REQUISITES: A course on "Object Oriented Programming".

COURSE DESCRIPTION:

HTML5, CSS3; JQuery, Bootstrap; PHP, PHP with MySQL database; Node.js; AngularJS.

COURSE OUTCOMES:

After successful completion of the course, the student will be able to:

- **CO1.** Demonstrate knowledge on HTML5 and CSS3.
- **CO2.** Develop and validate interactive web pages.
- **CO3.** Design web pages compatible for various devices.
- **CO4.** Demonstrate programming skills to develop web applications.
- **CO5.** Apply Node.js and AngularJS to make web pages more interactive, scalable and user friendly.

DETAILED SYLLABUS:

UNIT I – HTML5 AND CSS3

HTML5: Overview of HTML and XHTML, HTML5 - Introduction, HTML5 Document Structure, Creating Editable Content, Checking Spelling Mistakes, Exploring Custom Data Attributes, Microdata, Client-Side Storage, Drag and Drop Feature, Offline Web Applications, Web Communications.

CSS3: Introduction, Features of CSS3, Syntax of CSS, Exploring CSS selectors, Inserting CSS in HTML Document, State of CSS3.

UNIT II – JQUERY AND BOOTSTRAP

JQUERY: Fundamentals of JQuery, JQuery Selectors, JQuery Methods to Access HTML Attributes and Traversing, JQuery Manipulators, Events and Effects.

BOOTSTRAP: Getting Started with Bootstrap, Creating Responsive Layouts Using Bootstrap CSS, Basic HTML structure for Bootstrap, Responsive classes, Rendering images. the grid system. Constructing data entry forms.

UNIT III – INTRODUCTION TO PHP AND DATABASE CONNECTION

Introduction, Data Types, Variables, Constants, Expressions, String Interpolation, Control Structures, Functions, Arrays, Embedding PHP Code in Web Pages, PHP and Web Forms, PHP with MySQL. Interacting with the Database.

UNIT IV – NODE.JS

Installing Node.js, Selecting a Node.js IDE, Working with Node Packages, Creating a Node.js Application, Creating a Node.js Package Module, Writing Data to Console, Node.js Event Model, Adding Work to the Event Queue, Implementing Timers, Implementing Event Emitters and Listeners, Implementing Callbacks, Handling Data I/O in Node.js, Accessing the File System from Node.js.

UNIT V – *ANGULARJS*

Introduction: Introduction to Angular, Modules, Directives, Data Binding, Services, Using the Angular CLI, Creating a Basic Angular Application. **Angular Components:** Component Configuration, Defining a selector, Building a Template, Using Inline CSS and HTML in Angular Applications. Using Constructors, Using External Templates. Expressions, Data Binding, Built-in Directives.

TEXT BOOKS:

1. Kogent Learning Solutions Inc, *"HTML 5 Black Book: Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP and JQuery,"* 1st Edition. Dreamtech Press. 2011.
2. Brad Dayley, Brendan Dayley, Caleb Dayley, *"Node.js, MongoDB and Angular Web Development,"* 2nd Edition, Pearson Education. 2014.

REFERENCE BOOKS:

1. Andrea Tarr, *"PHP and MySQL,"* 1st Edition, Wily India, 2012.
2. Thomas A. Powell, *"The Complete Reference: HTML and CSS,"* 5th Edition, Tata McGraw Hill, 2010.

M.Tech. II Semester

(19MT22503) ADVANCED DATABASES

(Software Engineering)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	3	-	-	3

PRE-REQUISITES: Courses on Database Management Systems and Computer Networks.

COURSE DESCRIPTION: Parallel Databases; Object Based Databases; Distributed Databases; Distributed Transaction Management; Emerging Database Technologies and Applications.

COURSE OUTCOMES:

On successful completion of this course, the students will be able to:

CO1: Demonstrate knowledge on:

- Parallel databases.
- Object based and Object Relational databases.
- Distributed databases, horizontal and vertical data fragmentations.
- Mobile databases, Geographic Information Systems, Genome Data Management, Multimedia Database and NoSQL.

CO2: Demonstrate skills in Query optimization, Data Fragmentation, Transaction Management and Concurrency Control for Distributed Transactions.

CO3: Design Parallel, Object-Oriented, Object-Relational and NoSQL databases.

CO4: Solve Concurrency Problems in Distributed Transactions.

CO5: Use database techniques for Mobile, Geographic Information Systems, Genome Data Management, and Multimedia Data.

CO6: Create databases as per societal needs such as airline reservation, banking systems etc.

DETAILED SYLLABUS:

UNIT-I: PARALLEL DATABASES

Introduction, I/O Parallelism, Inter query Parallelism, Intra query Parallelism, Intra operation Parallelism, Interoperation Parallelism, Query Optimization, Design of Parallel Systems, Parallelism on Multicore Processors.

UNIT-II: OBJECT-BASED DATABASES

Overview, Complex Data Types, Structured Types and Inheritance in SQL, Table Inheritance, Array and Multi set Types in SQL, Object-Identity and Reference Types in SQL, Implementing O-R Features, Persistent Programming Languages, Object-Relational Mapping, Object-Oriented versus Object-Relational.

UNIT-III: DISTRIBUTED DATABASES

Features of Distributed versus Centralized Databases, Reference Architecture for Distributed Databases, Types of Data Fragmentation, Integrity Constraints in Distributed databases, Distributed Database Design

UNIT-IV: DISTRIBUTED TRANSACTION MANAGEMENT AND CONCURRENCY CONTROL

Distributed Transaction Management: Framework for Transaction Management, Supporting Atomicity of Distributed transactions, Concurrency Control for Distributed Transactions, Architectural Aspects of Distributed Transactions; **Concurrency Control:** Foundation of Distributed Concurrency Control, Distributed Deadlocks, Concurrency Control Based on Timestamps.

UNIT-V: EMERGING DATABASE TECHNOLOGIES AND APPLICATION

Mobile Database, Geographic Information Systems, Genome Data Management, Multimedia Database; NoSQL-An Overview of NoSQL, Characteristics of NoSQL, NoSQL Storage Types

TEXT BOOKS:

1. A. Silberschatz, H. F. Korth and S. Sudarshan, "*Database System Concepts,*" Tata McGraw hill , Fifth Edition, 2005.
2. Stefand Ceri and Giuseppe Pelagatti, "*Distributed Databases Principles and Systems,*" McGraw hill, First Edition, 2008.

REFERENCE BOOKS:

1. Ramea Elmasri and Shamkant B.Navathe, "*Fundamentals of database Systems,*" Pearson Education, Fifth Edition,2007.
2. Gaurav Vaish "*Getting Started with NoSQL,*" Packt Publishing, First Edition, 2013.(e-book)

SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)

Department of Information Technology

M.Tech. II Semester
(19MT22504) .NET TECHNOLOGIES
(Software Engineering)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	3	-	-	3

PRE-REQUISITES: A Course on "Object Oriented Programming".

COURSE DESCRIPTION: Knowledge on .NET Framework; The element of VB.NET; Writing Software with Visual Basic .NET; C# Programming; Object-oriented concepts with C#; Exception handling mechanism; Interfaces; Generics; Delegates and Events in C#; Database access with ADO.NET; Web application development using Web forms and Web controls.

COURSE OUTCOMES:

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

CO1: Demonstrate the knowledge on basics of .NET Platform.
CO2: Building simple VB .NET applications and Demonstrate problem solving skills
CO3: for creating VB .NET Applications.
CO4: Demonstrate basic knowledge on C# and problem solving skills for creating C#
CO5: applications
CO6: Design and Develop C# application to access the database.
CO7: Design and develop Graphical User Interface and Web applications using ASP .NET technologies.

DETAILED SYLLABUS:

UNIT I: INTRODUCING .NET PLATFORM and VB .NET

Benefits of the .NET platform, Building blocks of the .NET platform, Overview of .NET assemblies. Common type system, Common language specification, Common language runtime, Platform-independent nature of .NET. The role of the .NET framework 4.5 SDK, Building .NET application using visual studio.

Visual Basic fundamentals: The Visual Basic .NET Development Environment, The element of VB.NET, VB.NET operators, Conditional structure and control flow, Methods.

UNIT – II: CORE VB .NET PROGRAMMING

Classes and Objects: Types, Structure and Enumeration, Classes, Methods, Interfaces, Exception handling and Classes, Collections, Arrays and other Data Structure, Delegates and Events Data Processing and I/O, Writing Software with Visual Basic .NET, Interfacing with the End User.

UNIT - III: CORE C# PROGRAMMING

Anatomy of a simple C# program, System data types and corresponding C# keywords. C# iteration constructs. Decision constructs and the Relational/equality operators. Understanding C# arrays, Introducing the C# class type, Constructors, Pillars of OOP, C# access modifiers, C# encapsulation services, The basic mechanics of inheritance, The Details of Inheritance, C#'s polymorphic support.

The role of .NET Exception Handling, The simplest possible example, System-level exceptions, Application level exceptions, Processing multiple exceptions.

UNIT - IV: INTERFACES, GENERICS, DELEGATES AND EVENTS, ADO.NET

Understanding interface types, Implementing an Interface, Role of generic type parameters , Creating custom generic methods, Creating custom generic structures and classes, Understanding the .NET delegate type, Delegate example, Generic Delegate, and C# Events, Understanding operator overloading.

High level definition of ADO.NET, ADO.NET data provider, ADO.NET namespaces, Data Readers , Database transactions, Role of the dataset, Working with Data Columns, Data Rows, Data Table, Data Adapters, Binding Data Table objects to windows forms GUIs.

UNIT - V: ASP.NET WEB FORMS AND WEB CONTROLS, STATE MANAGEMENT TECHNIQUES

The role of http, Web applications and web servers, Role of client side scripting, Posting back to the web server, Overview of ASP.NET API, Building a single file ASP.NET web page, Building an ASP.NET webpage using Code Files, ASP.NET web sites vs. ASP.NET Web applications, The life cycle of an ASP.NET web page, Understanding the nature of web controls, Major categories of ASP.NET web control, Maintaining session data, Cookies.

TEXT BOOKS:

1. Jeffrey R. Shapiro "*The Complete Reference Visual Basic .NET*" Tata Mcgraw Hill (2002 Edition).
2. Andrew Troelsen "*Pro C# 5.0 and the .NET 4.5 Framework*," Apress, Sixth Edition, 2012.

REFERENCE BOOKS:

1. Christian Nagel, Bill Evjen, Jay Glynn, Karli Watson, Morgan Skinner, "*Professional C# 4 and .NET 4*," WROX Publications, First Edition, 2010.
2. Mathew Mac Donald, "*The Complete Reference ASP.NET*," TATA McGraw Hill, First Edition, 2010.

M.Tech. II Semester
(19MT22506) SOFTWARE QUALITY ASSURANCE
(Software Engineering)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	3	-	-	3

PRE-REQUISITES: --Nil--

COURSE DESCRIPTION: Introduction to SQA, Software quality factors, components; Contract review, Development and quality plans: Reviews, Software testing strategies: Procedures and work instructions, Corrective and preventive actions, Documentation control; Software quality metrics, cost and quality standards.

COURSE OUTCOMES:

After successful completion of the course, the student will be able to:

- CO1: Understand the basic components of Software Quality Assurance, factors, reviews, testing and standards.
- CO2: Develop basic test suite design for improving software quality through Debugging.
- CO3: Identify the strengths and weaknesses of different quality metrics and quality management standards.
- CO4: Design and deploy novel software quality components through appropriate Procedures, work instructions and prepare effective documentation.
- CO5: Identify suitable metrics and estimate software cost for delivering quality software products.

DETAILED SYLLABUS:

UNIT I: INTRODUCTION TO SOFTWARE QUALITY ASSURANCE

Introduction: Software quality, Software quality assurance – definition and objectives.

Software quality factors: Classifications of software requirements into software quality factors, Product operation, Product revision and product transition software quality factors.

The components of the software quality assurance system: The SQA system – an SQA architecture, Pre-project components, Software project life cycle components, Management SQA components, SQA standards, system certification, and assessment components

UNIT II: PRE-PROJECT SOFTWARE QUALITY COMPONENTS

Contract review: Process and its stages, objectives, Implementation, Subjects, Internal projects

Development and quality plans: Objectives, Elements of the development plan and quality plan, Development and quality plans for small projects and for internal projects

UNIT III: SQA COMPONENTS IN THE PROJECT LIFE CYCLE

Integrating quality activities in the project life cycle: Factors affecting intensity of quality assurance activities in the development process, Verification, validation and qualification, A model for SQA defect removal effectiveness and cost.

Reviews: objectives, Formal design reviews (DRs), Peer reviews, A comparison of the team review methods

Software testing strategies: Definition and objectives, strategies, White box and Black box testing

UNIT IV: SOFTWARE QUALITY INFRASTRUCTURE COMPONENTS

Procedures and work instructions: The need, Manuals, Preparation, Implementation and updating

Corrective and preventive actions: Definitions, Actions process, Analysis of collected information, Development of solutions and their implementation, Follow-up of activities.

Documentation control: Introduction, Controlled documents and quality records, The controlled documents list, Controlled document preparation, Issues of controlled document approval, Issues of controlled document storage and retrieval

UNIT V: MANAGEMENT COMPONENTS OF SOFTWARE QUALITY, STANDARDS

Software quality metrics: Objectives of quality measurement, Classification of software quality metrics, Process metrics, Product metrics, Implementation and Limitations.

Costs of software quality: Objectives, The classic model and an extended model, Application, problems

Quality management standards: ISO 9001 and ISO 9000-3, CMM and CMMI, The Bootstrap methodology, The SPICE project and the ISO/IEC 15504, Structure and content of IEEE software engineering standards.

Total Periods: 45

TEXT BOOKS:

1. Danie Galin, *"Software Quality Assurance: From theory to implementation"*, Pearson Education, 2004.
2. G. Gordon Schulmeyer, *"Handbook of Software Quality Assurance"*, 4th Edition, Artech House, 2008.

REFERENCE BOOKS:

1. Stephen H. Kan, *"Metrics and Models in Software Quality Engineering"*, 2nd Edition, Pearson Publication, 2008.
2. M.G.Limaye, *"Software Testing: Principles and Techniques and Tools"*, 2010.
3. Dr.K.V.K.K.Prasad, *"Software Testing Tools"*, Dreamtech, 2012

M.Tech. II Semester
(19MT22531) Full Stack Technologies Lab
(Software Engineering)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
50	50	100	-	-	4	2

PRE-REQUISITES: --Nil--

COURSE DESCRIPTION: Hands on practice in designing, developing and executing HTML5, CSS3, JQuery, Bootstrap, PHP, Node.js and AngularJS.

COURSE OUTCOMES:

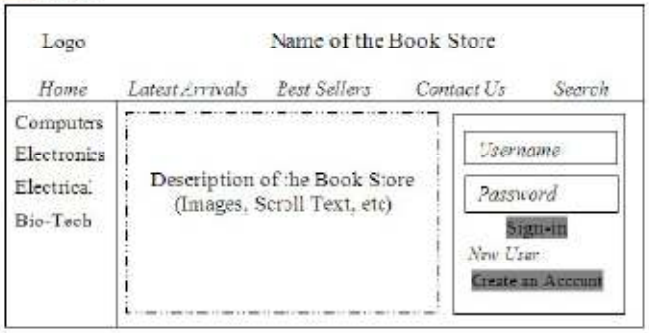
After successful completion of the course, the student will be able to:

- **CO1:** Demonstrate knowledge on web page design elements, dynamic content and database Interaction.
- **CO2:** Analyze user requirements to develop web applications.
- **CO3:** Design client-server applications using web technologies.
- **CO4:** Use HTML, CSS, JavaScript, JQuery, Bootstrap, PHP,Node.js, AngularJS technologies for device independent web application development.
- **CO5:** Apply web technologies to develop interactive, dynamic and scalable web applications for societal needs.
- **CO6:** Work effectively as an individual and as a member in team for mini-project implementation.
- **CO7:** Demonstrate communication skills, both oral and written for preparing and presenting reports.

List of Experiments:

1. Design the following static web pages required for an online book store web site.

a. Home Page:



The Home page must have the following three frames:

Top frame: Logo and the book store name and links to Home page, Latest arrivals, Best sellers, Contact us and Search.

Left frame: At least four links for navigation, which will display the books catalogue relevant to engineering disciplines. For e.g. when the link "Computers" is clicked, the catalogue relevant to computer science books will be displayed in the right frame.

Right frame: The pages of navigated links in the left and top frame must be loaded in the right frame. Initially it will load the Home page that can include the description of the book store, sign-in and create account information.

b. Catalogue Page:

The catalogue page should display the following details of available books.

i. Snap shot of cover page	ii. Title of the text book	iii. Author name
iv. Publisher	v. Price	vi. More details link.

c. Registration Page:

Design the Registration page with the following fields and navigate it with create an account link.

i. First Name	ii. Last Name	iii. Gender
iv. Date of Birth	v. Username	vi. Password
vi. Confirm Password	viii. Address	ix. Postal Code
x. Mobile No.	xi. Email-Id	

2. a. Design a web page to store username and password information using the local storage concept.

   b. Design a web page to store employee information including Name, Emp. Id, Department, Salary and Address on a client's machine using a real SQL database.

3. Apply the following styles to all web pages of online book store web application.
   a. Fonts and Styles: font-family, font-style, font-weight and font-size.
   b. Backgrounds and colors: color, background-color, background-image and background-repeat.
   c. Text: text-decoration, text-transformation, text-align and text-indentation, text-align
   d. Borders: border, border-width, border-color and bordersstyle
   e. Styles for links: A: link, A: visited, A:active, A:hover f. Selectors, Classes, Layers and Positioning elements.

4. Write a JQuery code to validate the following fields of the Registration web page.
   a. First Name/Last Name - should contain only alphabets and the length should not be less than 8 characters.
   b. Username - It should contain combination of alphabets, numbers and underscore. It should not allow spaces and special symbols.
   c. Password - It should not less than 8 characters in length and it contains one uppercase letter and one special symbol.
   d. Date of Birth - It should allow only valid date; otherwise display a message stating that entered date is invalid. Ex. 29 Feb. 2009 is an invalid date.
   e. Postal Code: It must allow only 6 digit valid number.
   f. Mobile No. - It should allow only numbers and total number of digits should be equal to 10.

g. e-mail id - It should allow the mail id with the following format: Ex. mailid@domainname.com

5. Design a web page with the following features using HTML5, JavaScript and JQuery

a. Displaying of images with Custom animated effects
b. Playing of selected video from the list of videos
c. Showing the animated text in increasing and decreasing font size
d. Changing the size of the area in a web page using DIV tag
e. Hiding and Showing elements in a web page.

6. Design a web page with the following features using Bootstrap and Media Query.

a. Components
b. Responsive tables
c. Responsive images and videos

7. a. Deploy and navigate web pages of online book store using WAMP/XAMPP web server.

b. Write a PHP program to read user name and favorite color from the HTML form.

Display the name of the user in green color and sets user favorite color as a background for the web page.

8. Write a PHP code to read user details entered through the registration web page and store the same into MySQL database.

9. Write a PHP code for storing books details like Name of the book, author, publisher, edition, price, etc into MySQL database. Embed a PHP code in catalogue page of the online book store to extract books details from the database.

10. Develop an interactive web page using Node.JS to insert registration details and display those details dynamically.

11. Design a web page with the following features of Node.js

a) Timers

b) Event Emitters and Listeners

c) Callbacks

12. Develop a Simple AngularJS web application that includes different components and also apply Inline CSS.

13. **Mini Project**

REFERENCES:

1. Kogent Learning Solutions Inc. HTML 5 Black Book: Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP and JQuery, Dreamtech Press, Second Edition, 2016.

2. W. Jason Gilmore, Beginning PHP and MySQL, APress, Fourth Edition, 2011.

3. Snig Bahumik, Bootstrap Essentials, PACKT Publishing, 2015. (e-book).

4. www.w3schools.com

5. www.tutorialspoint.com

SREE VIDYANIKETHAN ENGINEERING COLLEGE (Autonomous)

Department of Information Technology

M.Tech. II Semester

(19MT22532) SOFTWARE ARCHITECTURE AND DESIGN PATTERNS LAB

(Software Engineering)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
50	50	100	-	-	4	2

PREREQUISITES: Courses on "Advanced Software Engineering" and "Object Oriented Programming".

COURSE DESCRIPTION: Software development life cycle activities- Implementation of design models using enterprise architect; Creation of web service client; Implementation of Orchestration with BPEL; Test plan document; Regression testing, functional testing using UFT, and Selenium; Performance testing using Load Runner, and Web Performance Tool.

COURSE OUTCOMES:

After successful completion of this course, the students will be able to:

CO1: Demonstrate hands-on experience on:

- Web services
- Design issues and patterns

CO2: Design and develop basic design patterns, simulations for different software applications.

CO3: Identify and apply test case design methodologies for complex software engineering problems.

CO4: Develop and test web applications for debugging real time applications using Selenium and UFT tools.

CO5: Work individually and in teams collaboratively in implementing mini-projects.

CO6: Demonstrate communication skills both oral and written for preparing and presenting reports.

CO7: Engage in life-long learning and enthusiasm to upgrade knowledge and skills in latest technologies and tools.

LIST OF EXERCISES:

1. Implement the following diagrams by using Enterprise Architect 14.1
   i. Traceability ii. Roundtrip iii. visualization
   iv. Debugging v. Database modeling vi. Project Management
2. Write a Java program for 'Abstract Factory' and 'Decorator' design patterns.
3. Creation of web services and client applications to consume the following services:
   (i) Arithmetic Operations (ii) Finding prime numbers upto a given number 'N'.
4. Implementation of orchestration with BPEL for authenticating user credentials.
5. Create a test plan document for a web based application.
6. Write the Functional test cases for a Desktop based application. (Eg: Calculator)
7. Conduct the following functional testing for the flight reservation application using UFT 14.51
   i. The width of the GUI object "Name" in Flight Reservation window must be 150.
   ii. The flight schedule frame of Flight Reservation wincow should have the following properties: Height-283, Width-138, X-11,Y-84.
8. Conduct the following functional testing using UFT 14.51
   i. Test the EMPDB Application with CRUD operations.
   ii. Implement the following Checkpoints on the flight reservation application
      a. Standard Checkpoint
      b. Text Checkpoint
      c. Text Area Checkpoint
      d. Bitmap Checkpoint
      e. Database Checkpoint
9. Conduct Performance testing for a Desktop based application using Load Runrer.
10. Write a test suite of functional and regression testing for Web based application using
    Selenium.
11. Write and test a program to provide total number of objects present on the page using
    Selenium.
12. Write and test a program to login a specific web page using Selenium.
13. Develop a mini project which includes all SDLC activities for any web based application.

REFERENCE BOOKS:

1. James W.Cooper, "Java Design Patterns- A Tutorial," Pearson Education, 2000
2. Eric Newcomer and Greg Lomow, "Understanding SOA with Web Services," Pearson Education, 2009.
3. Ilene Burnstein, "Practical Software Testing," Springer, International Edition, 2003.
4. Dr. K. V. K. K.Prasad, "Software Testing Tools," Dreamtech, 1st Edition, 2004.
5. "UFT Documentation", https://www.learnqtp.com/uft-14-features/
6. "Selenium Documentation," http://docs.seleniumhq.org/docs/