DEPARTMENT OF COMPUTER SCIENCE

M.Sc. (Computer Science)
(Full Time Programme – Duration 2 years)

RULES, REGULATIONS AND COURSE CONTENTS
(With Effective from 2019-2020 Batch)

July 2019
<table>
<thead>
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## Semester wise Credit details:

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Evaluation and Examination Pattern:

The evaluation scheme for each course shall contain two parts; (a) internal evaluation and (b) external evaluation. 40% weightage shall be given to internal evaluation and the remaining 60% to external evaluation.

Each Paper (Theory & Practical) will have 100 Marks with CIA 40 Marks & End Semester Examination 60 Marks.

Internal evaluation:

The internal evaluation for theory papers shall be based on predetermined transparent system involving periodic written tests, assignments and mid semester examination. The internal evaluation for practical papers shall be based on performance in the Laboratory Involvement, skill /records/viva and model practical examination.

The weightage assigned to various components for internal evaluation of theory paper is as follows.

Internal Assessment Components:

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<th>Sl. No.</th>
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End Semester Examination - Pattern of Question Paper:

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SEMESTER - I

DATABASE SYSTEMS

UNIT- I

UNIT- II
INTRODUCTION TO SQL- Overview of the SQL Query Language, SQL Data Definition, Basic Structure of SQL Queries, Additional Basic Operations, Set Operations, Null Values, Aggregate Functions, Nested Subqueries, Modification of the Database.

UNIT -III

UNIT-IV

UNIT-V
System Architecture-Distributed Databases- Homogeneous and Heterogeneous Databases, Distributed Data Storage, Distributed Transactions, Concurrency Control in Distributed Databases, Distributed Query Processing.

TEXT BOOK:

REFERENCE BOOKS:
PROGRAMMING, DATA STRUCTURES AND ALGORITHMS USING PYTHON

UNIT- I
Python overview – Objects in Python-Expressions, Operators and Precedence-Control flow, Functions – simple Input and Output handling-Exception Handling- Modules and Import statement, Object oriented programming-Class and Modules-Creating Instances-Methods and Special Methods-Inheritance and Polymorphism.

UNIT- II

UNIT- III
Stacks, Queues and Dequeues – Stacks- The Stack- Abstract data type, Simple array based implementation- Reversing data using Stack-Queues, Linked list- Singly Linked list- Circular Linked list – Doubly Linked list.

UNIT- IV

UNIT- V

TEXT BOOK:

REFERENCE BOOKS:
DATA WAREHOUSING AND DATA MINING

UNIT - I

UNIT – II
DATA WAREHOUSING AND ONLINE ANALYTICAL PROCESSING - Data Warehouse: Basic Concepts-Data Warehouse Modeling: Data Cube and OLAP-Data Warehouse Design and Usage-Data Warehouse Implementation-Data Generalization by Attribute-Oriented Induction.

UNIT – III
DATA PREPROCESSING AND MINING FREQUENT PATTERNS - Data Preprocessing: An Overview-Data Cleaning, Data Integration, Data Reduction- Data Transformation. Data Mining Frequent Patterns, Associations, and correlations: Basic Concepts-Frequent Itemset Mining Methods.

UNIT – IV

UNIT – V
DATA MINING TRENDS AND RESEARCH FRONTIERS- Mining Complex Data Types-Other Methodologies of Data Mining- Data Mining Applications-Data Mining and Society-Data Mining Trends.

TEXT BOOK:

REFERENCE BOOKS:
OPERATING SYSTEM DESIGN

UNIT-I

UNIT-II

UNIT-III

UNIT-IV

UNIT-V

TEXT BOOKS:

REFERENCE BOOKS:
1. Program to count number of vowels in a given character string
2. Create a python class Account that has three instances of variables Account no, Customer name and Balance. Write a program to create methods for deposit and Withdrawal of amount from the account
3. Program for Binary search using recursion
4. Program for implementing Selection sort
5. Program for array based Stack implementation
6. Program for array based Queue implementation
7. Program for Implementing Stack with singly Linked List
8. Program for Implementing Queue with singly Linked List
9. Program for Implementing tree traversals
10. Program for Implementing Priority Queue using Heap
RDBMS LAB

1. Use of DDL, DML commands and retrieval of values from multiple tables
2. Creation of index, views and sequences
3. Perform Join operation on relational tables
4. Apply set operators
5. Use aggregate functions in SQL
6. Write Subqueries
7. Granting system privilege
8. PL/SQL blocks conditional, iterative and unconditional controls for making programs
9. Use of transactions
10. Processing of SQL statements using cursors
11. Use of Procedures and Functions
12. Use of database triggers
13. Use of Exception handling

Application: Design and develop any two of the following:

a. Library Information System
b. Students’ Information System
c. Ticket Reservation System
d. Hotel Management System
e. Hospital Management System
f. Employee Information System
SEMESTER – II

DATA COMMUNICATIONS AND NETWORKING

UNIT – I

UNIT – II

UNIT – III

UNIT - IV

UNIT – V

TEXT BOOK:

REFERENCE BOOKS:
UNIT-I
Introduction - Characteristics, Examples, Applications, Challenges – System models:- Architectural models and Fundamental models – Network principles and Internet protocols – Interprocess communication: API, Marshalling, Client-server communication, Group communication.

UNIT-II

UNIT-III
Distributed File System:- File service architecture, Sun network and Andrew File system, Recent advances – Name Services:- Domain Name System, Directory and discovery services, Case study for Global name service and Directory service – Time and Global States:- Clocks, events and processes, Clock synchronization, Logical clocks, Global states, Distributed debugging – Coordination and Agreement.

UNIT- IV
Transaction and Concurrency Control:- Transactions and nested transactions, Locks, Optimistic concurrency control, Timestamp ordering, Comparison of concurrency control – Distributed Transactions – Replication - Distributed Shared Memory: Design and implementation issues, Consistency models.

UNIT-V
Distributed Multimedia Systems:- Characteristics, Quality of service management, Resource management, Stream adaptation – Web Services:- Introduction, Service descriptions and IDL, Directory service, XML Security, Coordination of web services -Case Study:- CORBA.

TEXT BOOK:

REFERENCE BOOK:
VISUAL PROGRAMMING USING PYTHON

UNIT – I
Basic GUI Programming -Introduction to GUI Programming -Dialogs -Dumb Dialogs - Standard Dialogs - Smart Dialogs - Main Windows - Creating a Main Window Handling User Actions

UNIT – II
Using Qt Designer - Data Handling and Custom File Formats - Main Window Responsibilities - Data Container Responsibilities - Saving and Loading Binary Files - Saving and Loading Text Files - Saving and Loading XML Files.

UNIT – III

UNIT – IV
Events, the Clipboard, and Drag and Drop - The Event-Handling Mechanism – Re-implementing Event Handlers - Drag and Drop - Custom Widgets.

UNIT – V
Model/View Programming - Using the Convenience Item Widgets - Creating Custom Models - Creating Custom Delegates - Databases - Connecting to the Database - Executing SQL Queries - Using Database Form Views - Using Database Table Views.

TEXT BOOK:
1. Implementation of a socket program for Echo/Ping/Talk commands.
2. Creation of a socket between two computers and enable file transfer between them.
   Using (a.) TCP (b.) UDP
3. Implementation of a program for Remote Command Execution (Two M/Cs may be used).
4. Implementation of a program for CRC and Hamming code for error handling.
5. Writing a code for simulating Sliding Window Protocols.
6. Create a socket for HTTP for web page Upload & Download.
7. Write a program for TCP module Implementation (TCP services).
8. Developing network applications using RMI technology in Java.
9. Developing a program to simulate the Distributed Mutual Exclusion.
10. Program to implement a Distributed chat server using TCP sockets.
1. Signals-and-slot
2. Dialogs
3. Main Windows
4. Designing User Interfaces using Qt Designer
5. Layouts and Multiple Documents
6. Event Handling
7. Custom Widgets
8. Databases
SEMESTER-III

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

UNIT – I

UNIT – II

UNIT – III

UNIT – IV
Machine Learning and Data Mining - Data Analysis - Perceptron, a Linear Classifier - Nearest Neighbor Method - Decision Tree Learning- Learning of Bayesian Networks - Clustering- Exercises.

UNIT – V
Neural Networks - From Biology to Simulation- Hopfield Networks- Neural Associative Memory- Linear Networks with Minimal Errors- Back propagation Algorithm - Support Vector Machines – Applications.

TEXT BOOK:

REFERENCE BOOKS:
SOFTWARE ENGINEERING

UNIT – I

UNIT – II

UNIT – III

UNIT – IV

UNIT – V

TEXT BOOK:

REFERENCE BOOKS:
WEB TECHNOLOGY

UNIT - I

UNIT - II
Server side programming – Introduction to CGI, ASP, ASP.NET, PHP – Comparison between CGI & Servlet - Java Servlets - Servlet Architecture Overview, Servlets Generating Dynamic Content, Servlet Life Cycle, Parameter Data, Sessions, Cookies, URL Rewriting, Servlets and Concurrency.

UNIT – III
Separating Programming and Presentation: JSP Technology - Introduction to JavaServer Pages, JSP and Servlets, Basic JSP, JavaBeans Classes and JSP- JavaBeans Technology Basics, Instantiating Bean Objects, using JavaBeans Objects, Getters/Setters on Nonbean Objects - Support for the Model-View-Controller Paradigm

UNIT – IV
Building Blocks of PHP- Flow Control Functions in PHP - Working with Functions - Working with Arrays - Working with Forms Working with Cookies and User Sessions Interacting with MySQL Using PHP

UNIT – V

TEXT BOOK:

REFERENCE BOOKS:
1. Ivan Bayross, ”HTML, DHTML, JavaScript, Perl CGI”, BPB publication, 2006.
1. Executing simple programs using Prolog like Missionaries and cannibals Problem
2. Graph coloring problem
3. Blocks world problem
4. Water Jug Problem using DFS, BFS
5. Representation of Knowledge using Predicate Logic and Querying
6. Sampling Distributions
7. Statistical Inference
8. Regression Modeling
9. Multivariate analysis
10. K Means-Clustering
11. Bayesian Modeling
12. Neural Networks: Learning And Generalization
13. Principal Component Analysis
14. Fuzzy Logic
15. Mining Frequent Item sets
WEB TECHNOLOGY LAB

1. Develop static pages (using only HTML) of an online Book store. The website should consist the following pages. Home page, Registration and user Login, User profile page, Books catalogue, Shopping cart, Payment By credit card, order confirmation.

2. Develop a JavaScript to design a simple calculator to perform the following operations: sum, product, difference and quotient.

3. Develop a JavaScript code that displays two advertisements alternately. When the user clicks on one of the advertisements, he/she is redirected to “www.amazon.com”, and the other advertisement redirects the user to “www.fabmart.com”. The weight age of the Amazon advertisement is 50 and that of the other one is 40. The advertisement should be centered horizontally and should cover 60% of the width of the screen. Its height should be 80 units. The width of the border should be 5 units.

4. Develop a JavaScript for calculating income tax of an employee.

5. Develop ASP application to compute employee salary.

6. Develop a Servlet program to create and manipulate session.

7. Develop a JSP program for online book store.

8. Develop a JSP program to keep track of the number of visitors visiting the web page and to display this count of visitors, with proper headings.

9. Create a table which should contain at least the following fields: name, password, email-id, phone Number (these should hold the data from the registration form). Write a PHP program to connect to that database and extract data from the tables and display them. Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page.

10. Develop a PHP program to do necessary operations on the student records which are stored in the database using MYSQL.

11. User Authentication: a) Assume four users user1, user2, user3 and user4 having the passwords pwd1,pwd2,pwd3 and pwd4 respectively. Write a PHP for doing the following. 1. Create a Cookie and add these four user ID’s and passwords to this Cookie. 2. Read the user id and passwords entered in the Login form (week1) and authenticate with the values (user id and passwords) available in the cookies. If he is a valid user (i.e., user-name and password match) you should welcome him by name (user-name) else you should display “You are not an authenticated user”.

12. Design an XML document to store information about a student in an arts and science college affiliated to Pondicherry University. The information must include student-id, Name, and Name of the College, Branch, Year of Joining, and email id. Make up sample data for 10 students. Create a CSS style sheet and use it to display the document.
MOOCs e-certification / Journal Publication/Conference Presentation/Attending Internship Program

Guidelines:

Any one of the following:

Taken one MOOCs course (with e-certification)  
OR
Research publication (One No.) in National/International peer reviewed Journal  
OR
Presentation (Two research papers) in International Conferences  
OR
Attending an internship program for 4 weeks duration.

Evaluation Guidelines:

Viva-Voce Examination by Internal Examiner only.
Max. Marks:40 (Internal Marks only) for 2 credits,
SEMESTER-IV

BIG DATA & CLOUD COMPUTING

UNIT – I

UNIT – II

UNIT – III

UNIT – IV

UNIT – V

TEXT BOOKS:
PROJECT WORK AND VIVA-VOCE

**Evaluation of the Project:**

The candidate shall expected to take up an independent project involving problem formulation, design, implementation and testing phases that typically explores various phases of problem solving. He/She is expected to utilize the knowledge gained through various subjects studied in this programme. Further, the candidate has to inculcate the ability in integrating and releasing a prototype (working model) of the solution to the problem taken. The Project should be prepared and submitted for evaluation.

**Project - Internal Assessment:**

The following components are considered during the internal assessment:

For each project, Review team is constituted with three members of the department including the project guide. At least two reviews are to be scheduled and evaluated by the team and the average of the marks awarded by the members is taken as the project seminar mark.

<table>
<thead>
<tr>
<th>Component</th>
<th>Internal Assessment (150 Marks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Work</td>
<td>80 Marks – Given at the time of End Semester Examination by the Project Guide.</td>
</tr>
<tr>
<td>Project Review 1</td>
<td>20 Marks - Given by the review team members as evaluation of continuous progress.</td>
</tr>
<tr>
<td>Project Review 2</td>
<td>25 Marks - Given by the review team members as evaluation of continuous progress.</td>
</tr>
<tr>
<td>Project Review 3</td>
<td>25 Marks - Given by the review team members as evaluation of continuous progress.</td>
</tr>
</tbody>
</table>

**Project – External Assessment:**

External examiner evaluates the project out of 150 marks for the Project Work, Project Report and Project Viva.

<table>
<thead>
<tr>
<th>Component</th>
<th>External Assessment (150 Marks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Work</td>
<td>80</td>
</tr>
<tr>
<td>Project Report</td>
<td>40</td>
</tr>
<tr>
<td>Project Viva-Voce</td>
<td>30</td>
</tr>
</tbody>
</table>
List of Soft Core Papers offered by the Department

Level-I: Semester-I & Semester-II

1. Automata Theory and Computations
2. Bioinformatics
4. Cyber Security
5. Object Oriented System Design
6. Modeling and Simulation
7. Principles of Compiler Design
8. Principles of Programming Languages
9. Soft Computing

Level-II: Semester-III & Semester-IV

1. Blockchain and Bitcoin
2. Digital Image Processing
3. Information Retrieval Systems
4. Internet of Things
5. Mobile Application Development
6. Natural Language Processing
7. Operation Research
8. Professional Ethics
9. Web Services and SOA
10. Software Testing and Quality Management
AUTOMATA THEORY AND COMPUTATIONS


UNIT III: Turing Theory: Turing Machines – Computable Language and Functions – Techniques For TM Construction – Modification of TM.


TEXT BOOKS:


REFERENCE BOOK:

BIO INFORMATICS

UNIT – I

UNIT – II

UNIT – III

UNIT – IV

UNIT – V

TEXT BOOKS:

REFERENCE BOOK:
COMPUTER GRAPHICS AND MULTIMEDIA SYSTEMS

UNIT-I

UNIT-II

UNIT-III

UNIT- IV

UNIT-V

TEXT BOOKS
UNIT-I-SECURITY CONCEPTS AND MECHANISMS

UNIT-II-NETWORK SECURITY

UNIT-III-SYSTEM AND APPLICATION SECURITY

UNIT-IV-SECURITY MANAGEMENT

UNIT-V-CYBER DEFENSE TECHNIQUES

TEXT BOOKS

REFERENCE BOOKS
OBJECT ORIENTED SYSTEM DESIGN

UNIT - I

UNIT - II

UNIT - III

UNIT - IV
Object-Oriented Design – Object-Oriented Design Process and Design Axioms, Designing Classes.

UNIT - V

TEXT BOOKS:

REFERENCE BOOKS:
MODELING AND SIMULATION

UNIT-I-SYSTEMS AND ENVIRONMENT: Concept of model and model building, model classification and representation, Use of simulation as a tool, steps in simulation study.

UNIT-II-CONTINUOUS TIME AND DISCRETE-TIME SYSTEMS: Laplace transform, transfer functions, state-space models, order of systems, z-transform, feedback systems, stability, observability, and controllability. Statistical Models in Simulation: Common discrete and continuous distributions, Poisson process, and empirical distributions.

UNIT-III- RANDOM NUMBERS- Properties of random numbers, generation of pseudo random numbers, techniques of random number generation, tests for randomness, random variate generation using inverse transformation, direct transformation, convolution method, acceptance-rejection.

UNIT-IV-DESIGN AND ANALYSIS OF SIMULATION EXPERIMENTS: Data Collection, identifying distributions with data, parameter estimation, goodness of fit tests, selecting input models without data, multivariate and time series input models, verification and validation of models, static and dynamic simulation output analysis, steady-state simulation, terminating simulation, confidence interval estimation, Output analysis for steady state simulation, variance reduction techniques.

UNIT-V-QUEUING MODELS & LARGE SCALE SYSTEMS: Characteristics of queuing systems, notation, transient and steady-state behaviour, performance, network of queues, Model reduction, hierarchical control, decentralized control, structural properties of large scale systems.

TEXT BOOK

REFERENCE BOOKS
PRINCIPLES OF COMPILER DESIGN

UNIT - I
Introduction to Compiler - Analysis of the source program- Phase of a compiler- Cousins of the compiler - The grouping of phases- Compiler-construction tools- Simple One-pass Compiler – Overview - Syntax definition- Syntax-directed translation – Parsing - A translator for simple expressions - Lexical analysis - Incorporating a symbol table.

UNIT - II
Lexical Analysis - role of the lexical analyzer - Input buffering- Specification of tokens - Recognition of tokens - Language for specifying lexical analyzer - Finite automata -From a regular expression to an NFA.

UNIT - III
Syntax Analysis - The role of the parser - Context-free grammars - Writing a grammar – Top-down parsing - Bottom-up parsing.

UNIT - IV

UNIT - V

TEXT BOOK
PRINCIPLES OF PROGRAMMING LANGUAGES

UNIT-I

UNIT- II

UNIT- III

UNIT- IV

UNIT-V

TEXT BOOKS

REFERENCE BOOK
UNIT-I

UNIT-II

UNIT-III

UNIT-IV

UNIT-V

TEXT BOOK

REFERENCE BOOK
UNIT – I
Blockchain - Distributed systems - history of blockchain - Introduction to blockchain - Types of blockchain - CAP theorem and blockchain - Benefits and limitations of blockchain - Decentralization - Decentralization using blockchain - Methods of decentralization - Routes to decentralization - Blockchain and full ecosystem decentralization - Smart contract - Decentralized applications - Platforms for decentralization.

UNIT – II

UNIT – III

UNIT – IV

UNIT – V

TEXT BOOK
UNIT I - DIGITAL IMAGE FUNDAMENTALS
Elements of digital image processing systems, Vidicon and Digital Camera working, principles, Elements of visual perception, brightness, contrast, hue, saturation, Mach, band effect, Color image fundamentals - RGB, HSI models, Image sampling, Quantization, dither, Two-dimensional mathematical preliminaries, 2D transforms - DFT, DCT, KLT, SVD.

UNIT II - IMAGE ENHANCEMENT
Histogram equalization and specification techniques, Noise distributions, Spatial, averaging, Directional Smoothing, Median, Geometric mean, Harmonic mean, Contra-harmonic mean, filters, Homomorphic filtering, Color image enhancement.

UNIT III - IMAGE RESTORATION

UNIT IV - IMAGE SEGMENTATION

UNIT V - IMAGE COMPRESSION
Need for data compression, Huffman, Run Length Encoding, Shift codes, Arithmetic, coding, Vector Quantization, Transform coding, JPEG standard, MPEG.

TEXT BOOKS:

REFERENCE BOOKS:
INFORMATION RETRIEVAL SYSTEMS

UNIT-I

UNIT-II

UNIT-III

UNIT-IV
User Search Techniques: Search statements and binding, Similarity measures and ranking, Relevance feedback. Selective dissemination of information search, weighted searches of Boolean systems, searching the Internet and hypertext information.

UNIT-V
Visualization: Introduction, Cognition and perception, Information visualization technologies.

TEXT BOOKS:
INTERNET OF THINGS

UNIT – I

UNIT – II

UNIT – III
Programming Frameworks for Internet of Things – Introduction – Background - Survey of IoT Programming Frameworks.

UNIT – IV

UNIT – V

TEXT BOOK:
MOBILE APPLICATION DEVELOPMENT

UNIT-I- HISTORY OF MOBILE

UNIT-II-MOBILE DESIGN
Thinking in Context-Taking the Next Steps-Developing a Mobile Strategy-New Rules-Types of Mobile Applications-Mobile Application Medium Types-Mobile Information Architecture-The Design myth-Interpreting Design-the mobile design tent-pole-designing for the best possible experience-the elements of mobile design-mobile design tools-designing for the right device-designing for different screen sizes.

UNIT-III-MOBILE APPLICATION DEVELOPMENT
Mobile web apps versus native applications-the ubiquity principle-when to make a native application-when to make a mobile web application-what is mobile 2.0? Mobile web development-web standards-designing for multiple mobile browsers-device plans-markup-css: cascading style sheets-JavaScript.

UNIT-IV-INTRODUCTION TO ANDROID

UNIT-V-APPLICATION DEVELOPMENT
Developing for android-Developing for mobile devices-to do list example-android development tools-what makes an android application? Introducing the application manifest-using the manifest editor-the android application life cycle-understanding application priority and process states-externalizing r-sources-a closer look at android activities.

TEXT BOOKS:
1. Mobile Design and Development Practical concepts and techniques for creating mobile sites and web pages By Brian Fling Publisher: O’Reilly Media (Unit I, II, III).
2. Professional android Application Development by Reto Meier (Unit IV and Unit V).
UNIT I – INTRODUCTION

UNIT-II - PROBABILISTIC MODELS AND SPEECH RECOGNITION

UNIT-III - SYNTAX
Word classes and part-of-Speech Tagging-Tagsets-Transformation based tagging-Context free rules and trees-The noun Phrase-Co-ordination-Verb phrase-Finite state and context free grammars-Parsing with context free grammars.

UNIT-IV - UNIFICATION AND PROBABILISTIC PARSING

UNIT-V-SEMANTICS

TEXT BOOK:

REFERENE BOOKS:
OPERATION RESEARCH

UNIT-I-LINEAR PROGRAMMING PROBLEMS
Concept of LLP-Development of LLP-Graphical Method-Simplex Method-Big-M Method-Dual Simplex-Two Phase.

UNIT-II-SPECIAL CASES OF LLP
Mathematical Model for Transportation Problem-Types of Transportation Problem-Methods to solve Transportation Problem-Assignment Problem.

UNIT-III-DECISION THEORY
Decision under certainty-under risk-various decision criterions- decision tree.

UNIT-IV- GAME THEORY
Technologies of game theory- Game with pure and mixed strategies-Dominance-graphical method-LPP approach for games.

UNIT-V-SEQUENCING PROBLEM
Johnson’s algorithm for n jobs 2 machines- n jobs and 3-2 jobs through m machines.

TEXT BOOK:

REFERENCE BOOKS:
PROFESSIONAL ETHICS

UNIT-I - COMPUTER ETHICS INTRODUCTION AND COMPUTER HACKING

UNIT- II-ASPECTS OF COMPUTER CRIME AND INTELLECTUAL PROPERTY RIGHTS

UNIT- III- REGULATING INTERNET CONTENT, TECHNOLOGY AND SAFETY

UNIT- IV-COMPUTER TECHNOLOGIES ACCESSIBILITY ISSUES

UNIT-V- SOFTWARE DEVELOPMENT AND SOCIAL NETWORKING

REFERENCE BOOKS:
WEB SERVICES & SOA

UNIT – I
Web service and SOA fundamentals- Introduction - The concept of software as service (SaaS)- Web services versus Web based applications- Definition of Web services - Characteristics of Web services- Service interface and implementation.

UNIT - II
The Service Oriented Architecture - SOA operations - SOA entry points - Layers in an SOA - The Web service technology stack - Quality of service (QoS) - Web service interoperability - Web services versus components - RESTful services -Impact and shortcomings of Web services.

UNIT - III

UNIT – IV

UNIT - V
Registering and discovering services - The role of service registries - Service discovery - Universal Description, Discovery and Integration (UDDI) - The UDDI data structures - Mapping WSDL to UDDI - The UDDI API - Querying the UDDI model - SOA security and policies - Securing SOA and Web services - Network level security mechanisms - Application level security mechanisms - SOA development lifecycle- Unravelling the nature of SOA based applications - Rationale for SOA based application development- Typical SOA development pitfalls - Software development Lifecycle - Elements of SOA based applications - Best practices for developing SOA based applications - Reference model for SOA development - Guiding principles of SOA application development.

TEXT BOOK:
SOFTWARE TESTING AND QUALITY MANAGEMENT


TEXT BOOK:

REFERENCE BOOKS:
List of Soft Core Papers for Other Major Courses
offered by the Computer Science Department (w.e.f. 2019-2020)

1. Introduction to Information Technology
2. Multimedia Systems
3. Data Base Management System
4. Introduction to Web Programming

<table>
<thead>
<tr>
<th>Credit:</th>
<th>3 Credit in Soft Core Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Teaching Hrs.:</td>
<td>4 Hrs. (2 Hrs. in Theory and 2 Hrs. in Practical)</td>
</tr>
</tbody>
</table>

**Evaluation and Examination Pattern:**

The evaluation scheme for each course shall contain two parts; (a) internal evaluation and (b) external evaluation. 40% weightage shall be given to internal evaluation and the remaining 60% to external evaluation.

Each Paper will have 100 Marks with CIA 40 Marks & End Semester Examination 60 Marks.

**Internal evaluation:**

The internal evaluation shall be based on predetermined transparent system involving periodic written tests, mid semester examination, performance in the Laboratory Involvement, skill /records/viva and model practical examination.

The weightage assigned to various components for internal evaluation of theory paper is as follows:

**Internal Assessment Components:**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Component</th>
<th>Maximum Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Three Tests ( Best 2 out of 3 )</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>Mid Semester Examination</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>Performance in the Laboratory Involvement, skill /records/viva and model practical examination.</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td><strong>40</strong></td>
</tr>
</tbody>
</table>
## End Semester Examination - Pattern of Question Paper:

<table>
<thead>
<tr>
<th>Section</th>
<th>No. of Questions</th>
<th>Marks for Each Question</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10 Two Questions from each Unit</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>B</td>
<td>5 (One Question from each Unit, with Internal Choice)</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>C</td>
<td>3 out of 5 (One from each unit)</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td><strong>60</strong></td>
</tr>
</tbody>
</table>
INTRODUCTION TO INFORMATION TECHNOLOGY

UNIT – I INTRODUCTION
Types of computers, Characteristics of computers, Classification of computers, Anatomy of a digital computer, Memory unit, Input devices, Output devices.

UNIT – II OPERATING SYSTEM
Introduction, Functions of an operating system, Classification of operating systems, DOS, UNIX, Windows.

UNIT – III WORD PROCESSING WITH STYLE
Creating, saving, opening and printing documents- Formatting - Page layout - Graphic Image - Working with Tables – Columns - Mailing.

UNIT – IV WORKING WITH SPREADSHEETS
Working & editing with workbooks - Formatting a worksheet and applying formulas - Creating charts (Graphs) - Analysis the data - Importing & Exporting data.

UNIT-V WORKING WITH PRESENTATIONS AND INTRODUCTION TO INTERNET
Creating presentation - Types of view - Adding picture and graph - Adding sound & video - Animating the slides and objects.

TEXT BOOKS:

1. INTRODUCTION TO COMPUTERS, ALEXIS LEON, MATHEWS LEON, Leon Tech World.

REFERENCE BOOK:

MULTIMEDIA SYSTEMS

UNIT-I

UNIT-II

UNIT-III
Graphic and Image Data Representation-Image Data Types-8-bit color images, 24-bit color images, Color lookup table-Popular File Formats – GIF, JPEG, PNG.

UNIT-IV
Fundamental Concept in Video-Types of Video signals-Analog Video-Digital Video.

UNIT-V

TEXT BOOK:

REFERENCE BOOK:
DATA BASE MANAGEMENT SYSTEM

UNIT-I
Introduction to Database System-Objectives-Entities and Attributes- Data Models Database Management System-Tree Structure- Plex Structure-Data Description Languages, Relational Databases- Third Normal Form.

UNIT-II
MS-Access
Creating a database, creating and modifying tables, relating tables, entering and editing data.

UNIT-III
Retrieve and present information – Sorting, filtering and printing records- extraction information with queries-advanced queries.

UNIT-IV
Understanding form – creating new forms-using the form for data entry- modifying controls – adding other objects and special controls – creating a hierarchical form.

UNIT-V
Report design basic – Starting a new report- modifying the report design-sorting and grouping records in a report –adding a sub report - preview and print the report

TEXT BOOKS:
INTRODUCTION TO WEB PROGRAMMING

UNIT-I
Introduction to Internet-Resource of Internet- H/W & S/W requirement of Internet- Domain naming system, registering our domain name- URL- protocols server name-port-relative URLs. Overview of web browsers-Internet service providers- Internet services protocols concepts, Internet client and Internet servers.

UNIT-II

UNIT-III
Images and Hyperlink anchors-Image maps- Tables - Frames – Forms.

UNIT-IV
Introduction to DHTML- Introduction to style sheets, Setting the default style sheet language, Cascading Style sheets, Inline style information, External Style sheets.

UNIT-V

TEXT BOOKS:

1. Ian Graham- HTML 4.0 Source Book – A complete guide to HTML and HTML extension
2. Ernest Ackermann, Learning to use the Internet - Franklin Beadle & Associates (January 1995)