MANONMANIAM SUNDARANER UNIVERSITY
B.C.A
(CHOICE BASED CREDIT SYSTEM)
(WITH EFFECT FROM THE ACADEMIC YEAR 2017 -2018)

Se m	PartI /II/III/IV/ v/VI	Sub. No.	Subject Status	Subject Title	Contact Hrs/ week	L Hrs/ Week	T Hrs/ Week	P Hrs/ Week	Credits
v	III	34	Core	Software engineering	4	4	0	0	4
	III	35	Core	Web Technology	5	5	0	0	4
	III	36	Core	RDBMS	6	6	0	0	4
	III	37	Major Practical V	RDBMS Lab	4	0	0	4	2
	III	38	Major Elective I	Artificial Intelligence/Design and Analysis of Algorithm/cyber security/multimedia	4	4	0	0	4
	III	37	Project	Mini Project	5	0	0	5	4
	IV	38	Common	Personality development	2	2	0	0	2
			Sub Total		**30**				**24**

Total Credit = 21+21+25+26+24+25 >= 140 (Excluding computer era & Yoga)

L-Lecture   **T**-Tutorial   **P**- Practicals

Distribution of marks between External and Internal Assessment is

For Theory 75 : 25

For Practical 50 : 50

CORE SUBJECT – I

SOFTWARE ENGINEERING

L T P C
4 0 0 4

COURSE OBJECTIVES:
- To understand the nature of software & software engineering.
- To introduce principles of software development
- To learn about planning, developing, designing testing and validating a project.

UNIT I   SOFTWARE AND SOFTWARE ENGINEERING

The Nature of Software – What is Software Engineering? - Software engineering as a branch of the engineering profession – Stack holders in Software engineering - Software quality - Software engineering projects – Activities common to Software projects – Difficult and risk in software engineering as a whole. Review of Object Orientation: What is object orientation/ - Classes and objects – Instance variables – Methods, Operations and Polymorphism – Concepts best define object orientation – Difficulties and risks in programming language choice and object – oriented programming. **(12 L)**

UNIT II   DEVELOPING REQUIREMENTS

Domain analysis – The starting point for software projects – Defining the problem and the scope – What is a requirement? – Types of requirements – Some techniques for gathering and analyzing requirements – Managing changing requirements – Difficulties and risks in domain and requirements analysis. **(12 L)**

UNIT III   MODELING WITH CLASSES

What is UML? – Essentials of UML class diagrams – Associations and Multiplicity – Generalization – Instance diagrams – More advanced features of class diagrams. Modeling Interactions and Behavior: Interaction diagram – State diagrams – Activity diagrams.
(12 L)

UNIT IV ARCHITECTING AND DESIGNING SOFTWARE

The process of design – Principles leading to good design – Techniques for making good design decisions – Software architecture – Architectural patterns – Writing a good designing document. **(12 L)**

UNIT V   TESTING AND INSPECTING TO ENSURE HIGH QUALITY

Basic definitions – Effective and efficient testing – Defects in ordinary Algorithms – Defects in numerical algorithms – Defects in timing and co-ordination. Managing the Software Process: What is project management? – Software process models – Cost estimation – building software engineering teams – Project scheduling and tracking.
(12 L)

COURSE OUTCOMES:
- An ability to apply knowledge of mathematics, science, and engineering.
- An ability to design and conduct experiments, as well as to analyze and interpret data.
- An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- An ability to identify, formulates, and solves engineering problems.

TEXT BOOK:

1. Object Oriented Software Engineering, Timothy C.Lethbridge and Robert Laganiere, TMH 2004.

REFERENCE BOOKS:

1. Object Oriented and classical Software Engineering, Fifth Edition, Stephen, R. Schach, TMH.
2. Fundamentals of Software Engineering, Second Edition, CarioGhezzi, MedhiJazayeri, Dino Mandrioli, PHI.

CORE SUBJECT – II

WEB TECHNOLOGY

L T P C
5 0 0 4

COURSE OBJECTIVES:
- To provide the conceptual and technological developments in the field of Internet and web designing with the emphasis on comprehensive knowledge of Internet, Describe the basic concepts for network implementation.
- To learn the basic working scheme of the Internet and World Wide Web.
- Understand fundamental tools and technologies for web design.

UNIT I INTRODUCTION TO THE WEB
Understanding the Internet and World Wide Web – History of the Web – Protocols Governing the Web – Creating Websites for Individuals and the Corporate World – Web Applications – Writing Web projects – Identification of Objects – Target Users – Web Team – Planning and Process Development – Web Architecture –Internet Standards – TCP/IP Protocol Suite – IP Address – MIME – Cyber Laws.
Hyper Text Transfer Protocol (HTTP): Introduction – Web servers and clients – Resources – URL and its Anatomy – Message Format.
(14 L)

UNIT II HYPER TEXT MARKUP LANGUAGE (HTML)
History of HTML and W3C – HTML and its Flavors – HTML Basics – Elements, Attributes, and Tags – Basic Tags – Advanced Tags – Frames.
(12 L)

UNIT III JAVA SCRIPT
Introduction – Variables – Literals – Operators – Control Structure – Conditional statements – Arrays – Functions – Objects.
(10 L)

UNIT IV   EXTENSIBLE MARKUP LANGUAGE (XML)
Common Usage – Role of XML – Prolog – Body – Elements – Attributes – Validation – Displaying XML – Namespace.XML DTD: XML Schema Languages– Validation – Introduction to DTD– Purpose of DTD – Using a DTD in an XML Document.
(12 L)

UNIT V   COMMON GATEWAY INTERFACE (CGI)
Internet Programming Paradigm – Server – side Programming – Languages for CGI – Applications – Server Environment – Environment Variables – CGI Building Blocks – CGI Scripting Using C, Shell Script – Writing CGI programs – CGI Security – Alternatives and Enhancements to CGI. Servlet: Server – Side Java – Advantages Over Applets - Servlet Alternatives – Servlet Strength – Servlet Architecture – Servlet Life Cycle.
(12 L)

COURSE OUTCOME:

- Employ fundamental computer theory to basic programming techniques.
- Use fundamental skills to maintain web server services required to host a website.
- Select and apply markup languages for processing, identifying, and presenting of information in web pages.
- Use scripting languages and web services to transfer data and add interactive components to web pages.

TEXT BOOK:
1. Web Technologies – UttamK.Roy – OxfordUniversity Press 2010.

REFERENCE BOOKS:

1. Web Technology and Design, C. Xavier, New Age International Publishers.
2.Web Technologies TCp/IP Architecture and Java Programming Second Edition, Achyut S. Godbole&AtulKahate, Tata McGraw Hill.
3. Web Technology A Developer's Perspective, N.P.Gopalan, J.Akilandeswari, PHI.

RDBMS

L T P C
6 0 0 4

COURSE OBJECTIVES:
- To understand relational database concepts and transaction management concepts in database system.
- To write PL/SQL programs that use: procedure, function, package, cursor and Exceptions.
- To Use current techniques and tools necessary for complex computing practices.

UNIT I AN OVERVIEW: PERSONAL DATABASES
Client server databases – Oracle 9i An introduction – The SQL*Plus Environment – SQL – SQL*PLUS commands – Sample Databases. Oracle Tables; Naming rules and conventions – Data types – Constraints – Creating an Oracle table – Displaying table information's – Altering and exiting table – Dropping a table – Renaming a table – Truncating a table.

(12 L)

UNIT II   WORKING WITH TABLES
DML statements – Arithmetic operations – Where clause – sorting – Define command – Built in functions – Grouping data.   **(10 L)**

UNIT III MULTIPLE TABLES
Joints – Set operators – Subquery – Top – N Analysis .Advanced features: Views – Subsequences – Synonyms – Index.   **(12 L)**

UNIT IV   PL/SQL: FUNDAMENTALS
PL/SQL: FUNDAMENTALS – Block structure – Comments – Data types –Variable declaration – Anchored declaration – Assignment operation – Bind variables – Substitution Variables – Arithmetic operators. Structures in PL/SQL: Control structures – Nested blocks – SQL in PL/SQL DML in PL/SQL – Transaction Control Statements.
(14 L)

UNIT V   PL/SQL CURSORS & EXCEPTIONS
PL/SQL Cursors & Exceptions - PL/SQL Composite data types: Records, Tables and VARRAYS.
(12L)

COURSE OUTCOMES:
- Master the basic concepts and appreciate the applications of database systems.
- Master the basics of SQL and construct queries using SQL.
- Be familiar with a commercial relational database system (Oracle) by writing SQL using the system.

TEXT BOOK:
1. Database System Using Oracle – Second edition – Nilesh Shan – PHI 2007.

REFERENCE BOOK:
1. Oracle 9i Complete reference – Loney Koch - Tata McGraw Hill 2005.

MAJOR PRACTICAL - V

RDBMS LAB

PRACTICAL LIST

L T P C
0 0 4 2

ORACLE PROGRAMMING LIST:

1. Create an employee database with tables department, employee details, address, pay details and project details. After the tables and add constraints relevant to the fields in the tables. Insert records into all the tables.

2. Create queries to retrieve relevant information from a table.

3. Create a table from the exiting tables. Create views from the tables.

4. Develop queries to retrieve information from more than one table. Develop summary queries to retrieve relevant information from the table

5. Create a partition table and query the records.

6. Create a PL / SQL Program to print multiplication table.

7. Create a PL / SQL Program to check whether a given string is palindrome or not.

8. Create a PL / SQL Program to print student details using report.

9. Create a PL/SQL Program to perform updation using various triggers.

10. Create a PL/SQL Program to find factorial of numbers using function and procedure.

ELECTIVE I

ARTIFICIAL INTELLIGENCE

L T P C
4 0 0 4

COURSE OBJECTIVES:
- To introduce the basic principles, techniques, and applications of Artificial Intelligence.
- Emphasis will be placed on the teaching of these fundamentals, not on providing a mastery of specific software tools or programming environments.
- Assigned projects promote a 'hands-on' approach for understanding, as well as a challenging avenue for exploration and creativity.

UNIT I   PROBLEM, PROBLEM SPACES AND SEARCH
What is AI? – AI Problems – What is an AI technique – Defining the problem as a state space search – Production system - Production system – Characteristics – Problem Characteristics?
    (10 L)

UNIT II   HEURISTIC SEARCH TECHNIQUES
Generate and test – Hill Climbing – Best first Search – Problem Reduction – Constraints satisfaction – Means end analysis.
(12 L)

UNIT III   KNOWLEDGE REPRESENTATION
Representations and Mappings – Approaches to Knowledge Representation. Using predicate Logic: Representing simple facts in logic – Computable functions and prediction – Resolution – The basic of resolution – Resolution in Propositional Logic – The Unification algorithm – Resolution in Predicate Logic.
(14 L)

UNIT IV   REPRESENTING KNOWLEDGE USING RULES
Procedural versus – Declarative Knowledge – logic Programming – Forward versus Backward Reasoning – Matching.   **(12 L)**

UNIT V   GAME PLAYING
 The Minimax search procedure – Adding Alpha Beta cut offs – Addition Refinements – Waiting for Quiescence – Secondary Searches – Using Book moves.
(12 L)

COURSE OUTCOMES:

- Knowledge of what constitutes "Artificial" Intelligence and how to identify systems with Artificial Intelligence.
- Explain how Artificial Intelligence enables capabilities that are beyond conventional technology, for example, chess-playing computers, self-driving cars, robotic vacuum cleaners.
- Ability to apply Artificial Intelligence techniques for problem solving.

TEXT BOOKS:

1. Elain Rich Kevin knight "Artificial Intelligence" - Tata McGraw Hill.
2. Artificial Intelligence and Intelligent Systems – N.P.PADHY.

REFERENCE BOOKS:

1. Introduction to Artificial Intelligence Rajenda Akeskar PHI.
2. Artificial Intelligence by PH, Winston – Addison Wesley.
3. Introduction to Artificial Intelligence and Expert System by Patter.

DESIGN AND ANALYSIS OF ALGORITHMS

L T P C
4 0 0 4

COURSE OBJECTIVES:
- To know the basics of various sorting methods.
- To provide a thorough knowledge of the most common algorithms and data structures.
- To understand the design of algorithms.

UNIT I   DESIGN OF EFFICIENT ALGORITHMS
List, Queue and stacks- set representation – graphs – trees – recursion – divide and conquer – balancing – dynamic programming.
(12 L)

UNIT II   SORTING AND ORDER STATISTICS
The sorting problem – Radix sorting - Heap sort – quick sort.
(12 L)

UNIT III   DATA STRUCTURE FOR SET MANIPULATION PROBLEMS
Fundamental operations on sets –hashing – binary search – binary search trees – optimal binary search trees.
(12 L)

UNIT IV ALGORITHMS ON GRAPHS
Minimum cost spanning trees – depth first search - bi connectivity – depth first search of a directed graph – A transitive closure algorithm – shortest path algorithm.
(12 L)

UNIT V   MATRIX MULTIPLICATION AND RELATED OPERATIONS
Basics - Strassen's matrix multiplication algorithm – inversion of matrices – Lup decomposition of matrices – Applications of LUP decomposition.
(12 L)

COURSE OUTCOMES:
- Argue the correctness of algorithms using inductive proofs and invariants.
- Analyze worst-case running times of algorithms using asymptotic analysis.
- Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize divide-and-conquer algorithms. Derive and solve recurrences describing the performance of divide-and-conquer algorithms.

TEXT BOOK:
1.The Design and Analysis of Computer Algorithms - Alfred V Aho, John E Hopcroft, Jeffrey D Ullman, Addison Wesley series.

REFERENCE BOOKS:
1. Computer Algorithms. Ellis Horowitz. University of Southern California. SartajSahni. University of Florida.

CYBER SECURITY

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COURSE OBJECTIVES:
- To describe different classes of attacks.
- To describe new and emerging IT and IS technologies.
- To analyze threats and risks within context of the cyber security architecture.

UNIT I   INTRODUCTION TO INFORMATION SECURITY
Introduction – The History of Information Security – What is Security – Critical Characteristics of Information – NSTISSC Security Model – Components of an Information System – Securing Components – Balancing Information Security and Access – Approaches to Information Security Implementation – The Systems Development Life Cycle – The Security Systems development life cycle – Security Professional and the Organization – Communities of Interest - Information Security – Is it an Art or a Science. The Need for Security: Introduction – Business Needs First – Threats – Attacks – Secure Software Development.
(12 L)

UNIT II   RISK MANAGEMENT & PLANNING
Introduction – An overview of Risk Management – Risk Identification – Risk Assessment – Risk control Strategies – Selecting a Risk control Strategy – Quantitative versus qualitative risk control practices - Risk Management Discussion Points – Recommended Risk Control Practices. Planning for Security: Introduction – Information Security Policy, Standards and Practices – The Information Security Blueprint – Security Education, Training and Awareness Program – Continuity Strategies. Security Technology: Firewalls and VPNs: Introduction – Physical Design – Firewalls – Protecting Remote Connections.
(12 L)

UNIT III   SECURITY TECHNOLOGY: INTRUSION DETECTION, ACCESS CONTROL AND OTHER SECURITY TOOLS
 Introduction – Intrusion Detection and Prevention System (IDS and IPSs) – Honey Pots, Honey Nets and Padded Cell Systems – Scanning and Analysis Tools – Access Control Devices. Cryptography: Introduction – Foundations of Cryptology – Cipher Methods – Cryptographic Algorithms – Cryptographic Tools.
(12 L)

UNIT IV   SECURITY IMPLEMENTATION
Physical Security: Introduction – Physical Access Controls – Fire Security and Safety – Failure of Supporting Utilities and Structural Collapse – Interception of Data – Mobile and Portable Systems – Special Considerations for Physical Security Threats. Implementing Information Security: Introduction – Information Security Project Management – Technical Topics of Implementation – Non technical Aspects of Implementation – Information Systems Security Certification and Accreditation.   **(12 L)**

UNIT V SECURITY AND INFORMATION SECURITY

Security and Personnel: Introduction – Positioning & Staffing the Security Function – Credentials of Information Security Professionals – Employment Policies and Practices – Security Considerations for Nonemployees – Internal Control Strategies – Privacy and the Security of Personal Data. Information Security Maintenance: Introduction – Security Management Models – The Maintenance Model – Digital Forensics.
(12 L)

COURSE OUTCOMES:
- Evaluate the computer network and information security needs of an organization.
- Assess cyber security risk management policies in order to adequately protect an organization's critical information and assets.
- Measure the performance of security systems within an enterprise-level information system.

TEXT BOOK:

1.Principles and Practices of Information Security – Dr Michael E.Whitman, CISM, CISSP Herbert J.Mattord, CISM, CISSP – Cengage Learning India Private Limited Indian fourth edition Reprint 2010.

MULTIMEDIA

L T P C
4 0 0 4

COURSE OBJECTIVES:
- To define the principles, characteristics and forms of Visual Design in Multimedia Development.
- To define the role of Visual Reading Elements.
- To learn how to use multimedia software.

UNIT I MULTIMEDIA FUNDAMENTALS
Basic concepts - Multimedia applications Design consideration – Multimedia Application Goals & Objectives –Opportunities in multimedia production: Important in Multimedia development – Application Design and production.
(12 L)

UNIT II MULTIMEDIA APPLICATION
Structure and organization: Considering Interface design – Planning the production of your Application – Creating multimedia building blocks.
(12 L)

UNIT III MULTIMEDIA PRESENTATION
 Building blocks: Text - Graphics.   **(10 L)**

UNIT IV OTHER MULTIMEDIA TOOLS
 Multimedia presentation building blocks: video capturing, Sound Capturing and Editing.
(14 L)

UNIT V STRUCTURE AND FUNCTION OF AUTHORING SOFTWARE
 Authoring software, selection of authoring program - Fundamentals of Macromedia Director
(12L) COURSE OUTCOMES:
- Describe different realizations of multimedia tools and the way in which they are used.
- Analyse the structure of the tools in the light of low-level constraints imposed by the adoption of various QoS schemes (ie bottom up approach).
- Plan experiments to test user perception of multimedia tools.

TEXT BOOK:
1. Multimedia An Introduction- John Villain – Casanova- Louis Molina Prentice –Hall/Macmillan Computer Publishing, Reprint.

REFERENCE BOOK:
1. Multimedia: Making it works, 6th edition, TayVaughan;TMH, 6th Edition.

MINI PROJECT

OBJECTIVE:

To develop applications in PHP using various concepts like arrays, udf's, Sessions and make the students to understand and to establish the connectivity between PHP and MySQL and develop programs to add records, retrieve records and delete records from a table.

Each exercise should be completed within THREE hours. It is compulsory to complete all the exercises given in the list in the stipulated time.

1. Create a simple webpage using PHP.

2. Design a form to create an email. Store the data in a database. Validate all the input fields. Database connectivity in PHP with MySQL.

3. Create a MySQL database table tbllogin with fields user name and Password. Perform all database operations like select, insert, delete, update on the table tbllogin

4. Develop a CRUD application, which stands for Create, Read, Update, Delete. A quick example of a CRUD application would be a database of employees for a company. From the control panel, an admin would be about to add a new employee (create), view a list of employees (read), change an employee's salary (update) or remove a fired employee from the system (delete).

5. Create a table with two columns namely the name of the player and number of wickets. Create a Chart to display the data.

6. Create your college webpage.

7. Design a biodata form.