

# MANONMANIAM SUNDARANAR UNIVERISTY, TIRUNELVELI-12 SYLLABUS UG - COURSES – AFFILIATED COLLEGES



Course Structure for B.C.A (Choice Based Credit System)

(with effect from the academic year 2020-2021 onwards )

Semester-V								
Part	Subject Status	Subject Title	Subject Code	Credit				
3	Core	Software Engineering		4				
3	Core	Web Technology		4				
3	Core	RDBMS		4				
3	Major Practical	RDBMS Lab		2				
3	Major Elective	<ol> <li>Artificial Intelligence</li> <li>Design and Analysis of Algorithm</li> <li>Cyber Security</li> <li>Multimedia</li> </ol>		4				
3	Project	Mini Project		4				
4	Common	Personality Development	ACSB51	2				





#### Total Marks: 100 Internal Exam: 25 marks + External Exam: 75 marks

#### A. Scheme for internal Assessment:

Maximum marks for written test: **20 marks 3 internal tests**, each of **I hour** duration shall be conducted every semester. To the average of the **best two** written examinations must be added the marks scored in. The **assignment** for 5 marks.

The break up for internal assessment shall be: Written test- 20 marks; Assignment -5 marks Total - 25 marks

#### **B.** Scheme of External Examination

**3 hrs.** examination at the end of the semester

- A Part : 1 mark question two from each unit
- $B-Part:\ 5\ marks$  question one from each unit
- C Part: 8 marks question one from each unit

#### > Conversion of Marks into Grade Points and Letter Grades

S.No	Marks	Letter Grade	Grade point (GP)	Performance
1	90-100	0	10	Outstanding
2	80-89	A+	9	Excellent
3	70-79	А	8	Very Good
4	60-69	B+	7	Good
5	50-59	В	6	Above Average
6	40-49	С	5	Pass
7	0-39	RA	-	Reappear
8	0	AA	-	Absent

#### <u>Cumulative Grade Point Average (CGPA)</u>

$$\mathsf{CGPA} = \frac{\Sigma \left(\mathsf{GP} \times \mathsf{C}\right)}{\Sigma \mathsf{C}}$$

- **GP** = Grade point, **C** = Credit
- CGPA is calculated only for Part-III courses
- CGPA for a semester is awarded on cumulative basis

#### Classification

a)	First Class with Distinction	: CGPA $\geq$ 7.5*	
b)	First Class	: CGPA $\geq 6.0$	
c)	Second Class	: CGPA $\geq$ 5.0 and $\leq 6$	6.0

d) Third Class : CGPA< 5.0



# SOFTWARE ENGINEERING

## **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 – 1 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.

## **UNIT – 2 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.

# UNIT – 3 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.

# **UNIT - 4 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.

# **UNIT – 5 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.



#### **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,2nd Edition, McGraw Hill Education, 2005.

#### **REFERENCE BOOKS:**

1. Object Oriented and classical Software Engineering - Stephen, R. Schach, 5th Edition, McGraw Hill Education, 2011.

2. Fundamentals of Software Engineering - Carlo Ghezzi, Medhi Jazayeri, Dino Mandrioli, 2nd Edition, Pearson, 2015.

# WEB TECHNOLOGY

#### **COURSE OBJECTIVE:**

- 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 - 1 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.



# UNIT - 2 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 - 3 JAVA SCRIPT

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

# UNIT - 4 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 - 5 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.

# 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 - Uttam K. Roy, Oxford University Press 2010.

# **REFERENCE BOOKS:**

- 1. Web Technology and Design C. Xavier, New Age International Publishers, 2005.
- 2. Web Technologies TCP/IP Architecture and Java Programming Achyut S. Godbole & AtulKahate, Tata McGraw Hill, Second Edition, 2008.
- 3. Web Technology A Developer's Perspective N. P. Gopalan, J. Akilandeswari, PHI, 2nd Edition, 2014.



# RDBMS

#### **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 – 1 AN OVERVIEW

Personal database - 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

#### **UNIT - 2 WORKING WITH TABLES**

DML – Adding a new Rows/Records – Customized Prompts – Updating existing rows/records – Deleting existing rows/records – Retrieving data from a table - Arithmetic operations – Where clause – sorting.

#### **UNIT - 3 MULTIPLE TABLES**

Joins – Set operators. Subqueries: Subquery – Top – N Analysis. Advanced features: Views – Subsequences - Synonyms – Index.

#### **UNIT - 4 PL/SQL: FUNDAMENTALS**

PL/SQL: fundamentals – Block structure – Comments – Data types –Variable declaration – Anchored declaration – Assignment operation – Bind variables – Substitution Variables – Arithmetic operators. Control Structures: Control structures – Nested blocks – SQL in PL/SQL DML in PL/SQL – Transaction Control Statements.

#### **UNIT - 5 PL/SQL CURSORS & EXCEPTIONS**

Cursors – Implicit cursors – Explicit cursor – Explicit cursor attributes – Implicit cursor attributes – cursor FOR loops – SELECT ... FOR UPDATE- WHERE CURRENT of clause – cursor with parameters – Exceptions – Exception types – Records, Tables: PL/SQL Records – PL/SQL Tables – PL/SQL Varrays



## **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 - Nilesh Shah, 2nd Edition, Pearson, 2016. **REFERENCE BOOK**:

1. Oracle 9i Complete reference - Loney, Koch, Tata McGraw Hill, 2005.

# **ARTIFICAL INTELLIGENCE**

# **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 – 1 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

#### **UNIT – 2 HEURISTIC SEARCH TECHNIQUES**

Generate and test – Hill Climbing – Best First Search – Problem Reduction – Constraints satisfaction – Means end analysis.

# **UNIT – 3 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.

# **UNIT – 4 REPRESENTING KNOWLEDGE USING RULES**

Procedural versus – Declarative Knowledge – logic Programming – Forward versus Backward Reasoning – Matching.



# UNIT – 5 GAME PLAYING

The Minimax search procedure – Adding Alpha Beta cut offs – Addition Refinements – Waiting for Quiescence – Secondary Searches – Using Book moves.

## **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. Artificial Intelligence Elaine Rich, Kevin Knight & Shivshankar, Tata McGraw Hill, 2008.
- 2. Artificial Intelligence and Intelligent Systems N.P.Padhy, 2005.

## **REFERENCE BOOKS**:

- 1. Artificial Intelligence: A modern approach Stuart Jonathan, Russell, Pearson, 2019
- 2. Introduction to Artificial Intelligence Rajendra, Akerkar, PHI, 2014.

# **DESIGN AND ANALYSIS OF ALGORITHMS**

#### **COURESE 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 – 1 INTRODUCTION**

What is performance? – Space Complexity: Components of space complexity. Time Complexity: Components of time complexity – Operation counts – Best, worst Average counts – Step counts. Asymptotic Notations: Introduction – Big Oh Notation – Omega and Theta Notations – Complexity analysis examples

# **UNIT – 2 DIVIDE & CONQUER APPROACHES**

The Method – Applications [Merge Sort, Quick Sort, Defective chessboard] – Solving recurrence equations – Lower bound complexity.



# **UNIT -3 GREEDY METHOD**

Optimization problems – The Greedy Method – Applications [ Container Loading, Topological sorting, Single Source Shortest Paths]

# **UNIT – 4 BACKTRACKING**

Method – Applications [Max Clique, Travelling Salesperson, Board Permutation]

# **UNIT – 5 DYNAMIC PROGRAMMING**

The Method – Applications [ Matrix Multiplication chains – All pairs shortest path – Single source shortest path with negative costs]

## **COURSE OUTCOMES:**

- Argue the correctness of algorithms using inductive proofs and invariants.
- Analyse 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.

## **TEXT BOOK**

1. Data Structures, algorithms and applications in Java - Sartaj Sahni, Second Edition, University Press 2005

## **REFERENCE BOOKS**

- 2. Algorithms Dasgupta, Papadimitrou and Vazirani, McGraw-Hill Education, 2006.
- 3. Computer Algorithms Horowitz, Sahni, and Rajasekaran, Silicon Press, 2007.

# **CYBER SECURITY**

#### **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 – 1 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.

# **UNIT – 2 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.

## **UNIT – 3 SECURITY TECHNOLOGY**

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.

## **UNIT – 4 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.

#### **UNIT – 5 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.

#### **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.

Nesamony Memorial Christian College, Marthandam



• 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

## **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 - 1 MULTIMEDIA FUNDAMENTALS**

Basic concepts - Multimedia applications Design consideration – Multimedia Application Goals & Objectives –Opportunities in multimedia production: Important in Multimedia development Application Design and production.

# **UNIT - 2 MULTIMEDIA APPLICATION**

Structure and organization: Considering Interface design – Planning the production of your Application – Creating multimedia building blocks.

# **UNIT - 3 MULTIMEDIA PRESENTATION**

Building blocks: Text - Graphics.

# **UNIT - 4 OTHER MULTIMEDIA TOOLS**

Multimedia presentation building blocks: video capturing, Sound Capturing and Editing.

# **UNIT - 5 STRUCTURE AND FUNCTION OF AUTHORING SOFTWARE**

Authoring software, selection of authoring program - Fundamentals of Macromedia Director 5.0



## **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 - TayVaughan, 6th Edition, Tata MacGraw Hill.

# **RDBMS LAB**

## PRACTICAL 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 update using various triggers.
- 10. Create a PL/SQL Program to find factorial of numbers using function and procedure.



# 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 employeefrom 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.



# PERSONALITY DEVELOPMENT

### **UNIT: I - PERSONALITY**

Definition –Determinants –Personality Traits –Theories of Personality –Importance of Personality Development. SELF AWARENESS–Meaning –Benefits of Self – Awareness –Developing Self –Awareness. SWOT–Meaning –Importance-Application –Components. GOAL SETTING-Meaning-Importance –Effective goal setting – Principles of goal setting –Goal setting at the Right level.

## **UNIT : II- SELF MONITORING**

Meaning –High self –monitor versus low self monitor –Advantages and Disadvantages self monitor-Self –monitoring and job performance. PERCEPTION-Definition-Factor influencing perception-Perception process –Errors in perception – Avoiding perceptual errors. ATTITUDE–Meaning-Formation of attitude –Types of attitude -Measurementof Attitudes –Barriers to attitude change –Methods to attitude change.

ASSERTIVENESS-Meaning –Assertiveness in Communication –Assertiveness Techniques –Benefits of being Assertive –Improving Assertiveness.

## **UNIT : III - TEAM BUILDING**

Meaning –Types of teams –Importance of Team building-Creating Effective Team. LEADERSHIP–Definition –Leadership style-Theories of leadership –Qualities of an Effect leader. NEGOTIATION SKILLS–Meaning –Principles of Negotiation –Types of Negotiation –The NegotiationProcess –Common mistakes in Negotiation process. CONFLICT MANAGEMENT–Definition-Types of Conflict-Levels of Conflict – Conflict Resolution –Conflict management.

#### **UNIT : IV - COMMUNICATION**

Definition –Importance of communication –Process of communication – Communication Symbols –Communication network –Barriers in communication – Overcoming Communication Barriers. TRANSACTIONAL ANALYSIS–Meaning – EGO States –Types of Transactions –Johari Window-Life Positions. EMOTIONAL INTELLIGENCE-Meaning –Components of Emotional Intelligence-Significance of managing Emotional intelligence –How to develop Emotional Quotient. STRESS MANAGEMENT–Meaning –Sources of Stress –Symptoms of Stress –Consequences of Stress –Managing Stress.

# **UNIT :V - SOCIAL GRACES**

Meaning–Social Grace at Work –Acquiring Social Graces. TABLE MANNERS– Meaning –Table Etiquettes in Multicultural Environment-Do's and Don'ts of

Nesamony Memorial Christian College, Marthandam

Table Etiquettes. DRESS CODE–Meaning-Dress Code for selected Occasions –Dress Code for an Interview. GROUP DISCUSSION–Meaning –Personality traits required for Group Discussion-Process of Group Discussion-Group Discusson Topics. INTERVIEW–Definition-Types of skills –Employer Expectations –Planning for the Interview Questions-Critical Interview Questions.

#### **REFERENCES:**

- 1. Dr.S. Narayana Rajan, Dr. B. Rajasekaran, G. Venkadasalapthi, V. Vijuresh Nayaham and Herald M.Dhas, Personality Development, Publication Division, Manonmaniam Sundaranar University, Tirunelveli
- 2. Stephan P.Robbins, Organisational Behaviour, Tenth Edition, Prentice Hall of India Private Limited, New Delhi,2008.
- 3. Jit S. Chandan, Oragnisational Behaviour, Third Edition, Vikas Publishing House Private Limited, 2008.
- 4. Dr.K.K. Ramachandran and Dr.K.K. Karthick, From Campus to Corporate, Macmillan Publishers India Limited, New Delhi,2015.

