KONGU ARTS AND SCIENCE COLLEGE

(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore)

ERODE – 638 107

PROGRAM NAME

B.Sc. (Computer Technology)

KONGU ARTS AND SCIENCE COLLEGE

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2017-2018

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SYLLABUS

Sem	Course Code	Core 2: C Programming	Total Marks: 100		Hours Per Week	Credits
I	17UALCT102		CIA: 25	ESE: 75	4	4

OBJECTIVE:

To enable the students to learn about algorithms and programs and solve problems through logical thinking.

UNIT - I

Overview of C: History of C - Importance of C - Basic Structure of C Programs - Programming Style - Executing a C Program - **Constants, Variables and Data Types:** Character Set - C Tokens - Keywords and Identifiers - Constants - Variables - Data Types - Declaration of Variables - Declaration of Storage Class - Assigning Values to Variables - Defining Symbolic Constants - Declaring a Variable as Constant - Declaring a Variable as Volatile - Operators and Expressions.

UNIT - II

Decision Making and Branching: Decision Making with If statement - Simple If Statement - The If...Else Statement - Nesting of If...Else Statements - The Else If Ladder - The Switch Statement - The ?: Operator -The Goto Statement - **Decision Making and Looping:** The While Statement - The do Statement - The for Statement - Jumps in Loops.

UNIT - III

Arrays: One-Dimensional Arrays - Declaration of One-Dimensional Arrays - Initialization of One-Dimensional Arrays - Two-Dimensional Arrays - Initializing Two-Dimensional Arrays - Multi-Dimensional Arrays - Dynamic Arrays - **Character Arrays and Strings:** Declaring and Initializing String Variables - Reading Strings from Terminal - Writing Strings to Screen - Arithmetic Operations on Characters - Putting Strings Together - Comparison of Two Strings - String-Handling Functions - Table of Strings.

UNIT - IV

User Defined Functions: Definition of Functions - Return Values and Their Types - Function Calls - Function Declaration - Category of Functions - No Arguments and No Return Values - Arguments but No Return Values - No Arguments but Returns a Value - Functions that Returns Multiple Values - Nesting of Functions - Recursion - The Scope, Visibility and Lifetime of Variables - **Structures and Unions:** Introduction - Defining a Structure -

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Declaring Structure Variables - Accessing Structure Members - Structure Initialization - Arrays of Structures Arrays within Structures - Structures within Structures - Structures and Functions - Unions.

UNIT - V

Pointers: Introduction - Understanding Pointers - Accessing the Address of a Variable - Declaring Pointer Variables - Initialization of Pointer Variables - Accessing a Variable through its Pointer - Chain of Pointers - Pointer Expressions - Pointers and Arrays - Pointers and Character Strings - Array of Pointers - Pointer as Function Arguments - Functions Returning Pointers - Pointers to Functions - Pointers and Structures - **File Management in C:** Defining and Opening a File - Closing a File - Input/Output Operations on Files - Error Handling During I/O Operations - Random Access to Files - Command Line Arguments - The Preprocessor.

TEXTBOOK:

E.Balagurusamy, Programming in ANSI, Sixth Edition, Tata McGraw Hill Education, Third Reprint, 2012.

BOOKS FOR REFERENCE:

1. Pradip Dey, Manas Ghosh, Fundamentals of Computers with Programming in C, 1st Edition, Oxford Higher Education, 2007.
2. Ashok N. Kamthane, Programming with ANSI and Turbo, 1st Edition, Pearson Education, New Delhi, 2004.
3. Yeswanth Kanetkar, Let Us C, 8th Edition, BPB Publications, New Delhi, 2007.
4. Basavaraj.S, Amami, Shanmukhappa A.Angadi & Sunilkumar S.Manvi, Computer Concepts and C Programming, 2nd Edition, PHI, 2010.
5. Herbert Schildt, The Complete Reference C, 4th Edition, Tata McGraw-Hill, 2008.

QUESTION PAPER PATTERN		
SECTION - A	**SECTION - B**	**SECTION - C**
10 x 1 = 10 Marks (Multiple choice, Four options) Two questions from each unit	**5 x 7 = 35 Marks** (Either or choice) Two questions from each unit	**3 x 10 = 30 Marks** (Answer any three questions) One question from each unit

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Sem	Course Code	Allied 1: Numerical and Statistical Methods	Total Marks: 100		Hours Per Week	Credits
			CIA: 25	ESE: 75		
I	17UALAT104				5	4

OBJECTIVE:

To enable the students to understand the concepts of numerical and statistical methods for Computer Science.

(No Derivations, only problems)

UNIT - I

The Solution of Numerical Algebraic and Transcendental Equations: The Bisection Method - Regula Falsi Method - Newton-Raphson Method - Solution of Simultaneous Linear Algebraic Equations: Gauss-Elimination Method and Gauss-Seidel Method of Iteration.

UNIT - II

Interpolation: Newton's Forward and Backward interpolation formulae - Numerical Differentiation: Newton's Forward Difference - Newton's Backward Difference - Numerical Integration: The Trapezoidal Rule - Simpson's one-third Rule.

UNIT - III

Measures of Central Tendency: Mean, Median and Mode - Relationship among Mean, Median and Mode - Measures of Dispersion: Range, Quartile Deviation and Standard Deviation - Coefficient of Variation.

UNIT - IV

Correlation: Simple Correlation - Scatter Diagram - Karl Pearson's Coefficients of Correlation - Spearman's Rank Correlation Coefficient.

UNIT - V

Regression: Regression Lines - Regression in two variables - Simple problems - Difference between Correlation and Regression.

TEXTBOOKS:

1. Dr. P.Kandasamy, Dr. K.Thilagavathy and Dr. K.Gunavathi, "Numerical Methods", S.Chand, 2016.

UNIT - I : Chapter 3 : Sections 3.1, 3.3, 3.4
Chapter 4 : Sections 4.2, 4.9

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UNIT - II : Chapter 6 : Sections 6.2, 6.3

Chapter 9 : Sections 9.2, 9.3, 9.9, 9.11, 9.13, 9.16

2. S.P. Gupta, "Statistical Methods", Sultan Chand & Sons, 2012.

UNIT - III : Chapter 7 : Pages 181, 183, 184, 197-200, 212-216, 221,222

Chapter 8 : Pages 278-280, 287-293, 298

UNIT - IV : Chapter 10: Pages 395-401, 418-423

UNIT - V : Chapter 11: Pages 454, 459, 464-467

BOOKS FOR REFERENCE:

1. E. Balagurusamy, " Numerical methods", Tata MC Graw Hill Publishing Company Ltd, 2008.
2. S.C. Gupta, V.K.Kapoor, "Fundamental of Mathematical statistics", Sultan Chand and Sons, 2008.
3. Richard W.Hamming, "Numerical Methods for Scientists and Engineers", Dover Publications Inc., 1987.
4. R.S.N. Pillai & Bagavathi, "Statistics", Sultan Chand &Co, 2010.
5. PA. Navnitham, "Business Mathematics & Statistics", Jai Publishers, 2011.

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10 x 1 = 10 Marks (Multiple choice, Four options) Two questions from each unit	**5 x 7 = 35 Marks** (Either or choice) Two questions from each unit	**3 x 10 = 30 Marks** (Answer any three questions) One question from each unit

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Sem	Course Code	Core 3: Data Structures	Total Marks: 100		Hours Per Week	Credits
II	17UALCT201		CIA: 25	ESE: 75	4	4

OBJECTIVE:

To enable the students to learn the basic techniques of algorithm analysis and programming skills.

UNIT - I

Introduction: Overview - Pointers and Dynamic Memory Allocation - Algorithm Specification - Data Abstraction - Performance Analysis - Performance Measurement - **Arrays and Structures:** Arrays - Dynamically Allocated Arrays - Structures and Unions - Polynomials - Sparse Matrices Using Arrays - Representation of Multidimensional Arrays.

UNIT - II

Stacks and Queues: Stacks - Stacks Using Dynamic Arrays - Queues - Circular Queues Using Arrays - A Mazing Problem - Evaluation of Expressions - Multiple Stacks and Queues.

UNIT - III

Linked Lists: Singly Linked Lists - Linked Stacks and Queues - Polynomials - Additional List Operations - Sparse Matrices Using Linked List - Doubly Linked Lists.

UNIT - IV

Trees: Introduction - Binary Trees - Binary Tree Traversals - **Graphs:** The Graph Abstract Data Type - Elementary Graph Operations - Minimum Cost Spanning Trees - Kruskal's Algorithm - Shortest Paths and Transitive Closure.

UNIT - V

Searching: Introduction - Binary Search - Indexed Sequential Search - **Sorting:** Insertion Sort - Quick Sort - How to sort fast - Merge Sort - Heap Sort - Sorting on Several Keys - List and Table Sorts - External Sorting.

TEXTBOOKS:

1. Horowitz Sahni Anderson-Freed, Fundamental of Data Structures in C, Universities Press (India) Private Limited, 2008. (Unit I, II, III, IV & V- Sorting).
2. ISRD, Data Structures Using C, Tata McGraw-Hill Publishing Company Limited, 2007. (Unit V- Searching).

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BOOKS FOR REFERENCE:

1. Data Structures through C, Yashwant Kanetkar, 2nd Edition, BPB Publication, 2009.
2. An Introduction to Data Structures with Applications, Tremblay J.P and Sorenson P.G, 2nd Edition, Tata McGraw Hill Education Private Ltd, 2002.
3. Data Structures using C, Aaron M.Tanenbaum, Yedidyah Langsam, Moshe J.Augenstein, 6th Edition, Pearson Education, 2008.
4. Introduction to Data Structures in C, Ashok N Kamthane, 2nd Edition, Pearson Education , 2008.
5. Data Structures and Algorithm Analysis in C, Mark Allen Weiss, 2nd Edition, Pearson Education, 1997.

QUESTION PAPER PATTERN		
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Sem	Course Code	Allied 2: Discrete Mathematics	Total Marks: 100		Hours Per Week	Credits
			CIA: 25	ESE: 75		
II	17UALAT204				5	4

OBJECTIVE:

To enable the students to understand the concepts of Discrete Structures, relations, functions, lattices and Boolean algebra.

UNIT - I

Connectives: Negation - Conjunction - Disjunction - Statement Formulas and Truth Tables - Conditional and Biconditional - Well-formed Formulas - Tautologies - Equivalence of formulas - Duality law - Tautological implications.

UNIT - II

Normal Forms: Disjunctive Normal Form - Conjunctive Normal Form - Principle Disjunctive Normal Form - Principle Conjunctive Normal Form - Predicate Calculus: Predicates - The Statement Function, Variables and Quantifiers - Predicate Formulas - Free and Bound Variables - Inference Theory of the Predicate Calculus: Theory of Inference for the Predicate Calculus.

UNIT - III

Relations and Ordering: Relations - Properties of Binary Relations in a Set - Relations Matrix and Graph of a Relation - Equivalence Relation - Composition of Binary Relations - Partial Ordering - Partially Ordered Set: Representation and Associated Terminology.

UNIT - IV

Functions: Definition and Introduction - Composition of functions - Inverse functions - Grammar and Languages: Discussion of Grammars - Formal Definition of a Language.

UNIT - V

Lattices: Definition and Examples - Some Properties of Lattices - Some Special Lattices. Boolean Algebra: Definition and Examples - Boolean Functions.

TEXTBOOK:

J. P. Tremblay and R. Manohar, "Discrete Mathematics Structures with Applications to computer science", 32nd Reprint, Mc Graw Hill International, 2008.

UNIT - I : Chapter 1 : Sections 1.2.1-1.2.4, 1.2.6-1.2.11

UNIT - II : Chapter 1 : Sections 1.3.1-1.3.4, 1.5.1-1.5.4, 1.6.4

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UNIT - III : Chapter 2 : Sections 2.3.1-2.3.3, 2.3.5, 2.3.7-2.3.9

UNIT - IV : Chapter 2 : Sections 2.4.1-2.4.3

Chapter 3 : Sections 3.3.1-3.3.2

UNIT - V : Chapter 4 : Sections 4.1.1,4.1.2, 4.1.5, 4.2.1, 4.3.1.4.3.2

BOOKS FOR REFERENCE:

1. J.K.Sharma, "Discrete Mathematics", Second Edition, Macmillan India Ltd, 2005.
2. J. P. Tremblay and R. Manohar, "Discrete Mathematical Structures with Applications to Computer Science", 32nd Reprint, Tata McGraw-Hill Publishing Company Limited, 2008.
3. Dr. A.Singaravelu, Dr. M.P.Jeyaraman, "Discrete Mathematics", Meenakshi Agencies, 2012.
4. K. Balakrishnan, "Introductory Discrete Mathematics", Dover Publications Incs, October, 2010.
5. A.Solairaju, M.Chadrasekhar, S.Ganesh and R.Krishnamoorthy, "Discrete Mathematics Structures", Anuradha Agencies, 2001.

QUESTION PAPER PATTERN		
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SEMESTER - V

Course: Core 9: Visual Basic .NET Programming **Hours per week: 6**

Course Code: 15UALCT501 **Credit: 4**

Objective:

To enable the students to learn the .NET Technology.

UNIT - I

Visual Studio .NET: Key Components of the .NET Framework - Application Execution in the .NET Framework - Exploring Visual Studio .NET: Visual Basic .NET Advantages - Applications Commonly Developed in Visual Studio .NET - Visual Studio .NET IDE: Visual Studio Interface - Customizing Development Environment.

UNIT - II

Windows Forms: Introduction to Visual Basic .NET - Creating Windows Forms - Working with Controls - Windows Forms - Variables - Controlling Program Flow - Procedures in Visual Basic .NET.

UNIT - III

Implementing VB .NET Classes - Handling Errors in Visual Basic .NET - Accessing a Database.

UNIT - IV

Web Forms: Introducing ASP .NET - ASP .NET Applications - ASP .NET Web Forms Server Controls - Working with Validation Controls - Developing ASP .NET Server Controls.

UNIT - V

Rich Web Controls - Data Binding with Server Controls - Working with Web Server Control Templates - ADO .NET with ASP .NET.

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Textbook:

Mridula Parihar, Yesh Singhal, Nitin Pandey, Visual Studio .NET Programming, Wiley dreamtech india Pvt.Ltd, First Edition, 2002, Reprint 2007.

Books for Reference:

1. Jeffrey R.Shapiro, Visual Basic .NET: The Complete Reference, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2002, Eleventh Reprint 2007.
2. Steven Holzner, Visual Basic .NET Programming, Black Book, Dreamtech Press, Reprint Edition 2008.
3. Deitel & Deitel, Nieto, Visual Basic .NET How to Program,Pearson Education, Second Edition, Second Indian Reprint 2005.
4. Bill Evjen, Jason Beres, et al., Visual Basic .NET Programming Bible, Wiley India(P) Ltd, New Delhi, 2006.
5. C.Muthu, Visual Basic .NET, Tata McGraw Hill, Vijay Nicole Imprints Private Limited, First Reprint 2008.

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SEMESTER - V

Course: Core 10: Database Management Systems **Hours per week: 5**

Course Code: 15UALCT502 **Credit: 4**

Objective:

To enable the students to learn about knowledge of DBMS, both in terms of use and implementation.

UNIT - I

Databases and Database Users: Introduction - An Example - Characteristics of the Database Approach - Actors on the Scene - Advantages of Using the DBMS Approach - A Brief History of Database Applications - **Database System Concepts and Architecture:** Data Models, Schemas and Instance - Three-Schema Architecture and Data Independence - The Database System Environment - Centralized and Client/Server Architectures for DBMSs - Classification of Database Management Systems.

UNIT - II

Data Modeling Using the Entity-Relationship (ER) Model Using High-Level Conceptual Data Models for Database Design - Entity Types, Entity Sets, Attributes and Keys - Relationship Types, Relationship Sets, Roles and Structural Constraints - Weak Entity Types - ER Diagrams, Naming Conventions and Design Issues - **The Enhanced Entity-Relationship (EER) Model:** Subclasses, Superclasses and Inheritance - Specialization and Generalization - Modeling of UNION Types Using Categories - Data Abstraction, Knowledge Representation and Ontology Concepts.

UNIT - III

The Relational Data Model and Relational Database Constraints: Relational Model Concepts - Relational Model Constraints - Update operations, Transactions and Dealing with Constraint Violations - **Functional Dependencies and Normalization for Relational Databases:** Functional Dependencies - Normal Forms based on Primary Keys - General Definitions of Second and Third Normal Forms - Boyce-Codd Normal Form.

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UNIT - IV

SQL-99: Schema Definition, Constraints, Queries and Views: SQL Data Definition and Data Types - Schema Change Statements in SQL - Basic Queries in SQL - More Complex SQL Queries - INSERT, DELETE and UPDATE Statements in SQL - Specifying Constraints as Assertions and Triggers - Views in SQL - **Introduction to Transaction Processing Concepts and Theory:** Introduction to Transaction Processing - Transaction and System Concepts - Desirable Properties of Transactions.

UNIT - V

Database Recovery Techniques: Recovery Concepts - Recovery Techniques Based on Deferred Update - Recovery Techniques Based on Immediate Update - Shadow Paging - **Database Security:** Introduction to Database Security Issues - Discretionary Access Control Based on Granting and Revoking Privileges - Encryption and Public Key Infrastructures - Challenges of Database Security.

Textbook:

Ramez Elmasri, Shamkant B.Navathe, Fundamentals of Database Systems, Fifth Edition, Pearson Education, 2008.

Books for Reference:

1. Abraham Silberschatz, Henry F.Korth, Sudarshan, Database System Concepts, 5th Edition, McGraw- Hill International Edition, 2006.
2. C.J.Date, A.Kannan, S.Swamynathan, An Introduction to Database Systems, 8th Edition, Pearson Education, New Delhi, 2008.
3. Rajesh Narang, Database Management Systems, 2nd Edition, Eastern Economy Edition, 2011.
4. Ramakrishnan, Gehrke, Database Management Systems, 3rd Edition, McGraw-Hill, 2003.
5. Alexis leon, Mathews leon, Essentials of Database Management Systems, L&L Consultancy Services Pvt Ltd, 2006.

SEMESTER - V

Course : Core 11: Computer Networks **Hours per week : 6**

Course Code: 15UALCT503 **Credit: 4**

Objective:

To enable the students to learn the various components in a data communication system, network protocols, architecture and applications.

UNIT - I

Introduction: Uses of Computer Networks - Network Hardware - Network Software - Reference Models - Network Standardization.

UNIT - II

The Physical Layer: Guided Transmission Media - Wireless Transmission - Communication Satellites - Digital Modulation and Multiplexing: Frequency Division Multiplexing - Time Division Multiplexing - Code Division Multiplexing - The Public Switched Telephone Network.

UNIT - III

The Data Link Layer: Data Link Layer Design Issues - Error Detection and Correction - Elementary Data Link Protocols: A Simplex Stop-and-Wait Protocol for an Error-Free Channel - Sliding Window Protocols: A One-Bit Sliding Window Protocol - A Protocol Using Go-Back-N - **The Medium Access Control Sublayer:** Multiple Access Protocols: Carrier Sense Multiple Access Protocols - Collision-Free Protocols - Ethernet: Classic Ethernet Physical Layer - Classic Ethernet MAC Sublayer Protocol - Fast Ethernet - Gigabit Ethernet.

UNIT - IV

The Network Layer: Network Layer Design Issues: Store-and-Forward Packet Switching - Services Provided to the Transport Layer - Comparison of Virtual-Circuit and Datagram Networks - Routing Algorithms: Shortest Path Algorithm - Flooding - Distance Vector Routing - Link State Routing - Multicast Routing - Congestion Control Algorithm:

Approaches to Congestion Control - Load Shedding - The Network Layer in the Internet: The IP Version 4 Protocol - IP Address - IP Version 6 - Internet Control Protocols.

UNIT -V

The Transport Layer: The Transport Service: Services Provided to the Upper Layers - Transport Service Primitives - Elements of Transport Protocols: Error Control and Flow Control – Multiplexing - Congestion Control - The Internet Transport Protocols: UDP: Introduction to UDP - Remote Procedure Call - The Internet Transport Protocols: TCP: Introduction to TCP - The TCP Service Model - **Application Layer:** DNS - The Domain Name System - Electronic Mail.

Textbook:

Andrew S. Tanenbaum, David J. Wetherall, Computer Networks, Fifth Edition, Pearson, Second Impression, 2013.

Books for Reference:

1. Behrouz A. Forouzan, Data Communications and Networking, Third Edition, Tata McGraw- Hill, Third Reprint, 2004.
2. Andrew S. Tanenbaum, Computer Networks, Fourth Edition, Pearson, Eighth Impression, 2011.
3. Achyut S. Godbole, Data Communications and Networks, Tata M cGraw-Hill, Twelfth Reprint, 2008.
4. Larry L.Peterson , Bruce S.Davie, Computer Networks - a systems approach, Fifth Edition, Elsevier, First Indian Reprint, 2011.
5. Schaum's Outlines, Computer Networking, Tata McGraw-Hill Edition, Second Reprint, 2003.

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SEMESTER - V

Course: Core Lab 5: VB .NET and RDBMS Lab **Hours per week: 5**

Course Code: 15UALCP504 **Credit: 4**

ORACLE

1. Create a table for Employee details with Employee Number as **Primary Key** and following fields: Name, Designation, Gender, Age, Date_of_Joining and Salary. Insert at least ten rows and perform various Queries using any one Comparison, Logical, Set, Sorting and Grouping Operators.
2. Create tables for library management system which demonstrate the use of **Primary Key** and **Foreign Key.** Master table should have the following fields: Accno, Title, Author and Rate. Transaction table should have the following fields: User_id, Accno, Date_of_Issue and Date_of_Return. Create a Report (Select Verb) with fields Accno, Title, Date of Issue for the given Date of Return with column formats.
3. Write a PL/SQL to update the rate field by 20% more than the current rate in inventory table which has the following fields: Prono, ProName and Rate. After updating the table a new field (Alter) called for Number of item and place for values for the new field without using PL/SQL block.
4. Create a database **trigger** to implement on **master** and **transaction** tables which are based on inventory management system for checking data validity. Assume the necessary fields for both tables.

VB .NET

5. Write a program to design an Arithmetic Calculator using Buttons and Textbox.
6. Write a program to create Menus, Status Bars and Tool Bars.
7. Write a program to select image from list box and display it in the picture box.
8. Write a program to perform the following basic data manipulations using ADO .NET
   (i) Insertion (ii) Updation (iii) Deletion
9. Write a program to create web form using Web Control to enter E-Mail registration form.
10. Write a program to apply appropriate Validation techniques in E-mail Registration form using Validation Controls.

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11. Develop a web application to retrieve data from the form and display it in the Client browser in table format.
12. Write a program to create an application for College portal.

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SEMESTER - V

Course: Elective - I - A: Open Source Programming **Hours per week: 5**

Course Code: 15UALET505 **Credit: 4**

Objective:

To enable the students to learn the practices of programming in PHP and MySQL.

UNIT - I

Introduction: Basic Development Concepts - Creating PHP Script - **Variables and Operators:** Storing Data in Variables - Understanding PHP's Data Types - Setting and Checking Variable Data Types - Using Constants - Manipulating Variables with Operators - Handling Form Input.

UNIT - II

Controlling Program Flow: Writing Simple Conditional Statements - Writing Complex Conditional Statements - Repeating Actions with Loops - Working with String and Numeric Functions - **Working with Arrays:** Storing Data in Arrays - Processing Arrays with Loops and Iterators - Using Arrays with Forms - Working with Array Functions - Working with Dates and Times.

UNIT - III

Functions and Classes: Creating User Defined Functions - Creating Classes - Using Advanced OOP Concepts - **Working with Files and Directories:** Reading Files - Writing Files - Processing Directories.

UNIT - IV

Working with Databases and SQL: Introducing Databases and SQL - Using PHP's MySQLi Extension - Adding or Modifying Data - Handling Errors - Using PHP's SQLite Extension - Using PHP's PDO Extension.

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UNIT - V

Cookies and Sessions: Working with Cookies - Working with Sessions - **Securing PHP:** Sanitizing Input and Output - Securing Data - Securing Configuration Files - Securing Database Access - Securing Sessions - Validating User Input - Working with Required Fields - Working with Numbers - Working with Strings - Working with Dates - Configuring PHP Security.

Textbook:

Vikram Vaswani, PHP A Beginners's Guide, McGraw Hill Education (India) Edition, 2009.

Books for Reference:

1. Steven Holzner, The PHP Complete Reference, Tata McGraw-Hill Education (India) Private Limited, 2008.
2. Matt Doyle, Beginning PHP 5.3, Wiley India Private Limited, 2010, Reprint 2012.
3. Mcgrath Mike, PHP programming in Easy Steps, Dream Tech Publication, First Edition 2002.
4. Lerdorf Rasmus, Tatroe Kevin, Macintyre Peter, Programming PHP, Shroff Publishers & Distributors Private Limited, Second Edition, 2006.
5. Josh Lockhart, Modern PHP New Features and Good Practices, O Rielly, 2015.

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SEMESTER - V

Course: Elective - I - B: Cyber Law **Hours per week: 5**

Course Code: 15UALET506 **Credit: 4**

Objective:

To enable the students to learn about the Information Technology Act.

UNIT - I

Cyber Crime and Criminal Justice: Penalties, Adjudication and Appeals Under the IT Act, 2000: Concept of 'Cyber Crime' and the IT Act, 2000 - Hacking - Teenage Web Vandals - Cyber Fraud and Cyber Cheating - Virus on the Internet - Defamation, Harassment and E-mail Abuse - Cyber Pornography - Other IT Act Offences - Monetary Penalties, Adjudication and Appeals Under IT Act, 2000 - Network Service Providers - Jurisdiction and Cyber Crimes - Nature of Cyber Criminality, Strategies to Tackle Cyber Crime and Trends.

UNIT - II

Contracts in the Infotech World: Contracts in the Infotech World - Click-Wrap and Shrink-Wrap Contracts: Status under the Indian Contract Act, 1872 - Contract Formation on the Internet - Terms and Conditions of Contracts - **Jurisdiction in the Cyber World:** Questioning the Jurisdiction and Validity of the Present Law of Jurisdiction - Jurisdiction and the Information Technology Act, 2000 - Jurisdictional Disputes W.R.T the Internet in the United States of America.

UNIT - III

Battling Cyber Squatters and Copyright Protection in the Cyber World: Concept of Domain Name and Reply to Cyber Squatters - Meta-Tagging - The Battle Between Freedom and Control on the Internet - Works in Which Copyright Subsists and Meaning of Copyright - Copyright Protection of Content on the Internet; Copyright Notice, Disclaimer and Acknowledgement - Downloading for Viewing Content on the Internet, Hyper-linking and Framing - Computer Software Piracy.

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UNIT - IV

The Indian Evidence Act of 1872 v. Information Technology Act, 2000: Status of Electronic Records as Evidence - Proof and Management of Electronic Records; Relevancy, Admissibility and Probative Value of E-Evidence - Proving Digital Signatures - Proof of Electronic Agreements - Proving Electronic Messages - Other Amendments in the Indian Evidence Act by the IT Act - Amendments to the Bankers' Books Evidence Act, 1891 and Reserve Bank of India Act, 1934.

UNIT - V

Protection of Cyber Consumers in India: Are Cyber Consumers Covered Under the Consumer Protection Act? - Goods and Services - Consumer Complaint - Defect in Goods and Deficiency in Services - Restrictive and Unfair Trade Practices - Instances of Unfair Trade Practices - Reliefs Under CPA - Beware Consumers - Consumer Foras, Jurisdiction and Implications on Cyber Consumers in India - Applicability of CPA to Manufacturers, Distributors, Retailers and Service Providers Based in Foreign Lands Whose Goods are Sold or Services Provided to a Consumer in India.

Textbook:

Vivek Sood, Cyber Law Simplified, Tata McGraw Hill Publishing Company Limited, New Delhi, Third Reprint 2006 .

Books for Reference:

1. Pavan Duggal, Text Book on Cyber Law Universal Law Publishing, 2014.
2. Jonathan Rosenoer, Cyber Law: The Law of Internet, Springer 1997.
3. Brain Craig, Cyber Law: The Law of Internet and Information Technology, Pearson Education, 2012.
4. Harish Chander, Cyber Laws and IT Protection, PHI Learning Private Limited, 2012.
5. Justice Yatindra Singh, Cyber Laws, Sixth Edition, Universal Law Publishing Co.Pvt.Ltd., 2016.

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SEMESTER - V

Course: Elective - I - C: System Software **Hours per week: 5**

Course Code: 15UALET507 **Credit: 4**

Objective:

To enable the students to learn the design and implementation of assemblers, linkers and loaders and understand about macro processors and compilers.

UNIT - I

Introduction: What is System Software? - Goals of System Software - Views of System Software - **Language Processors: Overview of Language Processors:** Programming Languages and Language Processors - Language Processing Activities - Fundamentals of Language Processing - Symbol Tables.

UNIT - II

Assemblers: Elements of Assembly Language Programming - A Simple Assembly Scheme - Pass Structure of Assemblers - Design of Two Pass Assembler - **Macros and Macro Preprocessors:** Introduction - Macro Definition and Call - Macro Expansion - Nested Macro Calls - Advanced Macro Facilities - Design of a Macro Preprocessor.

UNIT - III

Linkers and Loaders: Introduction - Relocation and Linking Concepts - Design of a Linker - Self-Relocating Programs - Linking of Overlay Structured Programs - Dynamic Linking - Loaders - **Scanning and Parsing:** Programming Language Grammars - Scanning - Parsing - Language Processor Development Tools.

UNIT - IV

Compilers: Causes of a Large Semantic Gap - Binding and Binding Times - Data Structures Used in Compilers - Scope Rules - Memory Allocation - Compilation of Expressions - Compilation of Control Structures - Code Optimization.

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UNIT - V

Interpreters: Benefits of Interpretation - Overview of Interpretation - **Software Tools:** What is a Software Tool? - Software Tools for Program Development - Editors - Debug Monitors - Programming Environments - User Interfaces.

Textbook:

D M Dhamdhere, Systems Programming, Tata McGraw Hill Education Private Limited, New Delhi, 2011.

Books for Reference:

1. Leland L. Beck, System Software - An Introduction to Systems Programming, 3rd Edition, Pearson Education Asia, Ninth Indian Reprint 2002.
2. Santanu Chattopadhyay, System Software, Prentice-Hall of India, 2007.
3. Leland L. Beck, D.Manjula, System Software - An Introduction to Systems Programming, 3rd Edition, Pearson Education, Third Impression 2008.
4. D M Dhamdhere, Systems Programming and Operating Systems, Second Revised Edition, Tata McGraw Hill, 27th Reprint 2007.
5. John J. Donovan, Systems Programming, Tata McGraw-Hill, Tenth Reprint 1995.

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SEMESTER - V

Course: Skill Based Course 3 (Lab): Networks Lab **Hours per week: 3**

Course Code: 15UALSP508 **Credit: 3**

1. Write a program to identify the address of the node, connection number and network domain name.
2. Write a program to detect errors using Hamming Code.
3. Write a program to detect errors using CRC.
4. Write a program to implement Stop and Wait protocol.
5. Write a program to implement Sliding Window protocol.
6. Write a program to implement the Shortest Path Routing using Dijkstra algorithm.
7. Write a program to implement Socket Program.
8. Write a program to implement Remote Procedure Call under Client / Server environment.
9. Write a program to implement File Transfer Protocol.
10. Write a program to implement chatting.

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SEMESTER - V

Course: Advanced Learners Course 2 - A: Android Programming

Course Code: 15UALAL509 **Credit: 2**

Objective:

To enable the students to learn creating Android Applications.

UNIT - I

Introduction: What is Android? - Obtaining the Required Tools - Creating First Android Application - **Android User Interface:** Understanding the Components of a Screen - Adapting to Display Orientation - Managing Changes to Screen Orientation - Utilizing the Action Bar.

UNIT - II

Designing User Interface With Views: Using Basic Views - Using Picker Views - Using List Views to Display Long Lists - Understanding Specialized Fragments - **Displaying Pictures and Menus With Views:** Using Image Views to Display Pictures - Using Menus with Views.

UNIT - III

Data Persistence: Saving and Loading User Preferences - Persisting Data to Files - Creating and Using Databases - **Content Providers:** - Sharing Data in Android - Using a Content Provider.

UNIT - IV

Messaging: SMS Messaging - Sending E-mail - **Networking:** Consuming Web Services Using HTTP - Consuming JSON Services - Sockets Programming.

UNIT - V

Developing Android Services: Creating Own Services - Establishing Communication between a Service and an Activity - Binding Activities to Services - Understanding

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Threading - **Publishing Android Applications:** Preparing for Publishing - Deploying APK Files.

Textbook:

Wei-Meng Lee, Beginning Android 4 Application Development, John Wiley & Sons, Inc, Reprint 2015.

Books for Reference:

1. Jerome(J.F.) DiMarzio, Andriod - A Programmer's Guide, Tata McGraw- Hill Edition, The McGraw-Hill Companies, Third Reprint 2011.
2. Pradeep Kothari, Kogent Learning Solutions Inc., Android Application Development (with KitKat Support), Dreamtech press Inc., 2014.
3. W.Frank Ableson, Robi Sen, Chris King, C.Enrique Ortiz, Android in Action, Third Edition, Dreamtech press Inc., 2012.
4. B.M.Harwani, Android Programming Unleashed, First Edition, Pearson Education Inc, First Impression 2013.
5. Zigurd Mednieks, Laird Dornin, G.Blake Meike, and Masumi Nakamura, Programming Android, Second Edition, O'Reilly Media Inc., 2012.

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SEMESTER - V

Course: Advanced Learners Course 2 - B: Middleware Technologies

Course Code: 15UALAL510 **Credit: 2**

Objective:

To enable the students to learn the overview of Client/Server concepts, various Middleware Technologies and their roles.

UNIT - I

Client/Server Computing: What is Client/Server? - File Servers - Database Servers - Transaction Servers - Groupware Server - Object Servers - Web Servers - Middleware - General Middleware - Service specific middleware - Client/Server Building Blocks - RPC - Messaging - Peer to Peer.

UNIT - II

EJB's Architecture: Logical Architecture - Overview of EJB's Software Architecture - A High Level View of EJB Conversation - Building and Deploying EJBs - Roles in EJB.

UNIT - III

EJB Applications: Writing EJB Session Beans - Writing EJB Entity Beans - EJB Clients - EJB Deployment.

UNIT - IV

CORBA: An Introduction to CORBA: CORBA Overview - CORBA Concepts - CORBA's Growth - CORBA Interface Definition Language - The CORBA 2 Standard.

UNIT - V

Distributed Object Fundamentals: Selecting Data Types - Defining the Interfaces - Proxies, Stubs and Skeletons - Implementing the Servers - Implementing the Clients - Creating Objects - Invoking Object Methods - Destroying Objects.

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Text Books:

1. Robert Orfali, Dan Harkey and Jeri Edwards, The Essential Client/Server Survival Guide, Second Edition, Galgotia Publications, 2002. (UNIT I)
2. Tom Valesky, Enterprise Java Beans, Second Edition, Pearson Education, 2002. (UNIT II & III)
3. Thomas J.Mowbray, Willam A.Ruth, Inside CORBA, Addison Wesley, Third Printing February, 1998. (UNIT IV)
4. Jason Pritchard, COM and CORBA Side by Side, Second Edition, Addison Wesley, 2000. (UNIT V)

Books for Reference:

1. Mowbray, Inside CORBA, First Edition, Pearson Education, 2002.
2. Judith M. Myerson, The Complete Book of Middleware, Second Edition, Auerbach Publications, 2002.
3. Arno Puder, Kay Römer, Frank Pilhofer, Distributed System Architecture - A Middleware Approach, First Edition, Elsevier, 2005.
4. G. Sudha Sadasivam, Component Based Technology, Second Edition, Wiley India, 2008.
5. Edward Yourdon, Paul Allen, Stuart Frost, Component-Based Development for Enterprise Systems, First Edition, Cambridge University Press, 1998.

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SEMESTER - VI

Course: Core 12: Network Security **Hours per week: 6**

Course Code: 15UALCT601 **Credit: 4**

Objective:

To enable the students to learn the cryptography and the levels of network security.

UNIT - I

Introduction: Why Network Security is Needed - Management Principles - Security Principles - Network Management - Security Attacks - Qualities of a Good Network - **Organizational Policy and Security:** Security Policies, Standards and Guidelines - Information Policy - Security Policy - Physical Security - Social Engineering - Security Procedures - Building a Security Plan - **Security Infrastructure:** Infrastructure Components - Goals of Security Infrastructure - Design Guidelines - Security Models.

UNIT - II

Cryptography: Terminology and Background - Data Encryption Methods - Cryptographic Algorithms - Secret Key Cryptography - Public Key Cryptography - Message Digest - Security Mechanisms - Speech Cryptography - **Hardware and Software Security:** Hardware Security - Smart Card - Biometrics - Virtual Private Networks (VPNs) - Trusted Operating Systems - Pretty Good Privacy (PGP) - Security Protocols - **Database Security:** Introduction to Databases - Characteristics of Database Approach - Database Security Issues - Database Security - Vendor-Specific Security - Data Warehouse Control and Security.

UNIT - III

Intrusion Detection Systems: What is not an IDS? - Infrastructure of IDS - Classification of Intrusion Detection Systems - Host-Based IDS - Network-Based IDS - Anomaly vs Signature Detection - Manage an IDS - Intrusion Detection Tools - IDS Products and Vendors - **Network Security:** Fundamental Concepts - Identification and Authentication - Access Control - A Model for Network Security - Malicious Software - Firewalls.

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UNIT - IV

Network Management: Goal of Network Management - Network Management Standards - Network Management Model - Infrastructure for Network Management - Simple Network Management Protocol (SNMP) - **Security Management:** Security Plan - Security Analysis - Change Management - Disaster Recovery - Systems Security Management - Protecting Storage Media - Protection of System Documentation - Exchanges of Information and Software - Security Requirements of Systems.

UNIT - V

Electronic Mail Policy: Electronic Mail - What are the E-mail Threats that Organization's Face? - Why do you need an E-mail Policy? - How do you Create an E-mail Policy? - Publishing the E-mail Policy - University E-mail Policy - **Security of Internet Banking Systems:** Introduction Banking System - Security Problem - Methodology for Security Problem - Schematic Flow of Internet Banking - A Layered Approach to Security.

Textbook:

Brijendra Singh, Network Security and Management, Prentice-Hall of India Private Limited, New Delhi, 2007.

Books for Reference:

1. Charlie Kaufman, Radia Perlman, Mike Speciner, Network Security Private Communication in a Public World, Second Edition , Prentice-Hall of India, 2003.
2. Richard E.Smith, Internet Cryptography, Addison-Wesley, First Indian Reprint 1999.
3. Bible, Network Security, Second Edition, Wiley India Pvt Ltd, Reprint 2010.
4. Matt Bishop, Sathyanarayana S.Venkatramanayya, Introduction to Computer Security, Pearson Education, Second Impression 2007.
5. Neal Krawetz, Introduction to Network Security, Thomson Delmar Learning, First Indian Reprint 2007.

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SEMESTER - VI

Course: Core Lab 6: Network Security Lab **Hours per week: 5**

Course Code: 15UALCP602 **Credit: 4**

1. Write a program to encrypt data using substitution ciphers method.
2. Write a program to encrypt data using transposition cipher method.
3. Write a program to implement DES algorithm.
4. Write a program to encrypt and decrypt data using code-book cipher method.
5. Write a program to implement the Public Key Cryptography using Diffie-Hellman algorithm.
6. Write a program to implement the Public Key Cryptography using RSA algorithm.
7. Write a program to secure the Database using User Authentication security.
8. Write a program to verify the signature.
9. Write a program to check whether a password is strong or weak.
10. Write a program to implement mandatory access control.

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SEMESTER - VI

Course: Elective - II - A: Distributed Computing **Hours per week: 6**

Course Code: 15UALET603 **Credit: 4**

Objective:

To enable the students to learn the fundamental concepts and the design principles of distributed systems.

UNIT - I

Introduction: Definition of Distributed System - Goals - Types of distributed systems - **Architectures:** Architectural Styles - System Architectures - Architecture versus Middleware - Self-Management in Distributed Systems.

UNIT - II

Processes: Threads - Virtualization - Clients - Servers - Code Migration - **Communication:** Fundamentals - Remote Procedure Call - Message-Oriented Communication - Stream-Oriented Communication - Multicast Communication.

UNIT - III

Naming: Names, Identifiers and Addresses - Flat Naming - Structured Naming - Attribute-Based Naming - **Synchronization:** Clock Synchronization - Logical Clocks - Mutual Exclusion - Global Positioning of Nodes - Election Algorithms.

UNIT - IV

Consistency and Replication: Introduction - Data-Centric Consistency Models - Client-Centric Consistency Models - Replica Management - Consistency Protocols.

UNIT – V

Fault Tolerance: Introduction to Fault Tolerance - Process Resilience - Reliable Client-Server Communication - Reliable Group Communication - Distributed Commit - Recovery.

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Textbook:

Andrew S. Tanenbaum, Maarten Van Steen, Distributed Systems Principles and Paradigms, Second Edition, Prentice Hall of India, New Delhi, 2008.

Books for Reference:

1. Pradeep K Sinha, Distributed Operating Systems: Concepts and Design, Prentice Hall of India, New Delhi, 2007.
2. Joel M. Crichlow, An Introduction to Distributed and Parallel Computing, Second Edition, Prentice Hall of India, New Delhi, 2001.
3. James Martin, Computer Networks and Distributed Processing, Prentice Hall of India, 2003.
4. Uyless D. Black, Data Communication and Distributed Networks, Third Edition, Prentice Hall of India, 2004.
5. George Coulouris, Jean Dollimore, Distributed System Concepts and Design, Pearson Education, New Delhi, 2004.

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SEMESTER - VI

Course: Elective - II - B: Mobile Computing **Hours per week: 6**

Course Code: 15UALET604 **Credit: 4**

Objective:

To enable the students to learn the technologies in Mobile Computing.

UNIT - I

Introduction: Mobility of Bits and Bytes - Wireless The Beginning - Mobile Computing - Dialogue Control - Networks - Middleware and Gateways - Application and Services - Developing Mobile Computing Applications - Security in Mobile Computing - Standards - Why is it Necessary? - Standard Bodies - **Mobile Computing Architecture**: History of Computers - History of Internet - Architecture for Mobile Computing - Three-Tier Architecture - Design Considerations for Mobile Computing - Mobile Computing through Internet - Making Existing Applications Mobile-Enabled.

UNIT - II

Mobile Computing Through Telephony: Evolution of Telephony - Multiple Access Procedures - Mobile Computing through Telephone - Developing an IVR Application - Voice XML - Telephony Application Programming Interface (TAPI) - **Emerging Technologies:** Bluetooth - Radio Frequency Identification (RFID) - Wireless Broadband (WiMAX) - Mobile IP - Internet Protocol Version 6 (IPv6) - Java Card.

UNIT - III

Global System for Mobile Communications (GSM): Global System for Mobile Communications - GSM Architecture - GSM Entities - Call Routing in GSM - PLMN Interfaces - GSM Addresses and Identifiers - Network Aspects in GSM - GSM Frequency Allocation - Authentication and Security - **Short Message Service (SMS):** Mobile Computing over SMS - Short Message Services (SMS).

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UNIT - IV

General Packet Radio Service (GPRS): GPRS and Packet Data Network - GPRS Network Architecture - GPRS Network Operations - Data services in GPRS - Applications for GPRS - Limitations of GPRS - Billing and Charging in GPRS - **Wireless Application Protocol (WAP):** WAP - MMS - GPRS Applications.

UNIT - V

CDMA AND 3G: Spread-Spectrum Technology - Is-95 - CDMA versus GSM - Wireless Data - Third Generation Networks - Applications on 3G.

Textbook:

Asoke K Talukder, Roopa R Yavagal, Mobile Computing Technology, Applications and Service Creation, Tata McGraw - Hill Company Limited, New Delhi, Eleventh Reprint 2009.

Books for Reference:

1. Jochen Schiller, Mobile Communications, Second Edition, Pearson Education, New Delhi, 2004.
2. Uwe Hansmann, Lothar Merk, Martin S.Nicklons and Thomas Stober, Principles of Mobile Computing, Second Edition, Springer, New York, 2003.
3. Ivan Stojmenovic, Hand Book of Wireless Networks and Mobile Computing, John Wiley & Sons, New York, 2002.
4. Mohammad Ilyas Imad Mahgoub, Mobile Computing Hand Book, Amerbach Publications, 2005.
5. Raj Kamal, Mobile Computing, First Edition, Oxford University Press, 2005.

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SEMESTER - VI

Course: Elective - II - C: Parallel Processing **Hours per week: 6**

Course Code: 15UALET605 **Credit: 4**

Objective:

To enable the students to learn the parallel processor models, pipelining and scalable architectures.

UNIT - I

Parallel Computer Models: Multiprocessors and Multicomputers - Multivector and SIMD Computers - PRAM and VLSI models - **Program and Network Properties:** Program Flow Mechanisms - System Interconnect Architectures - **Principles of Scalable Performance:** Parallel Processing Applications.

UNIT - II

Hardware Technologies: Processors and Memory Hierarchy: Advanced Processor Technology - Superscalar and Vector processors - Memory Hierarchy Technology - Virtual Memory Technology - **Bus, Cache, and Shared Memory:** Bus Systems - Cache Memory Organizations - Shared Memory Organizations.

UNIT - III

Pipelining and Superscalar Techniques: Linear Pipeline Processors - Nonlinear Pipeline Processors - Instruction Pipeline Design - Arithmetic Pipeline Design - Superscalar Pipeline Design - **Multiprocessors and Multicomputer:** Multiprocessor System Interconnects - Message Passing Mechanisms.

UNIT - IV

Multivector and SIMD Computers: Multivector Multiprocessors - Compound Vector Processing - SIMD Computer Organizations - **Scalable, Multithreaded, and Dataflow Architectures:** Principles of Multithreading - Fine Grain Multicomputer - Scalable and Multithreaded Architectures.

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UNIT - V

Software for Parallel Programming: Parallel Programming Models - Parallel Languages and Compilers - Dependence Analysis of Data Arrays - Code Optimization and Scheduling - **Parallel Program Development and Parallel Programming Environments:** Software Tools and Environments - Visualization and Performance Tuning - Synchronization and Multiprocessing Modes - Message Passing Program Development.

Textbook:

Kai Hwang and Naresh Jotwani, Advanced Computer Architecture, Parallelism, Scalability, Programmability, Second Edition, Tata McGraw Hill Education Private Limited, Fourth Reprint 2012.

Books for Reference:

1. Kai Hwang and Faye A Briggs, Computer Architecture and Parallel Processing, First Edition, Tata McGraw-Hill, 2011.
2. William Stallings, Computer Organization and Architecture - Designing for Performance, Eighth Edition, Prentice Hall, 2010.
3. Vipin Kumar, Ananth Grama, Anshul Gupta, George Karypis, Introduction to Parallel Computing, Second Edition, Pearson India, 2003.
4. Michel J Quinn, Parallel Computing Theory and Practice, Second Edition, Tata McGraw-Hill, 2002.
5. David E.Culler, Jaswinder Pal Singh and Annop Gupta, Parallel Computer Architecture - A Hardware/Software Approach, First Edition, Elsevier, 2001.

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SEMESTER - VI

Course: Elective - III - A: Neural Networks **Hours per week: 6**

Course Code: 15UALET606 **Credit: 4**

Objective:

To enable the students to learn the basic functions, principles and concepts of Neural Networks.

UNIT - I

Introduction: What is a Neural Network? - Human Brain - Models of a Neuron - Neural Networks Viewed as Directed Graphs - Feedback - Network Architectures - Knowledge Representation - Artificial Intelligence and Neural Networks.

UNIT - II

Learning Processes: Introduction - Error-Correction Learning - Memory-Based Learning - Hebbian Learning - Competitive Learning - Boltzmann Learning - Credit Assignment Problem - Learning with a Teacher - Learning without a Teacher - Learning Tasks - Memory - Adaptation - Statistical nature of the Learning Process - Statistical Learning Theory.

UNIT - III

Single Layer Perceptrons: Introduction - Adaptive Filtering Problem - Unconstrained Optimization Techniques - Linear Least-Squares Filters - Least-Mean-Square Algorithm - Learning Curves - Learning Rate Annealing Techniques - Perceptron - Perceptron Convergence Theorem.

UNIT - IV

Multilayer Perceptrons: Introduction - Back-Propagation Algorithm - XOR Problem - Heuristics for Making the Back-Propagation Algorithm Perform Better - Output Representation and Decision Rule - Computer Experiment - Feature Detection - Back-Propagation and Differentiation - Hessian Matrix.

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UNIT - V

Radial-Basis Function Networks: Introduction - Cover's Theorem on the Separability of Patterns - Interpolation problem - Supervised Learning as an Ill-Posed Hypersurface Reconstruction Problem - Regularization Theory - Regularization Networks - Generalized Radial-Basis Function Networks - XOR problem - Estimation of the Regularization Parameter.

Textbook:

Simon Haykin, Neural Networks - A Comprehensive Foundation, Second Edition, Prentice Hall of India, 2003.

Books for Reference:

1. James A. Anderson, An Introduction to Neural Networks, Second Edition, Prentice Hall of India, 2003.
2. Bart Kosko, Neural Networks and Fuzzy Systems, Prentice Hall of India, 2005.
3. Kevin L.Priddy, Paul E.Keller, Artificial Neural Networks- An Introduction, Third Edition, Prentice Hall of India, 2007.
4. Sathish Kumar, Neural Networks-A classroom Approach, Tata McGraw Hill, 2011.
5. James A. Freeman, David M. Skapura, Neural Netwoks- Algorithms, Applications and Programming Techniques, Third Edition, Pearson Education, 2005.

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SEMESTER - VI

Course: Elective - III - B: Artificial Intelligence **Hours per week: 6**

Course Code: 15UALET607 **Credit: 4**

Objective:

To enable the students to apply AI techniques in applications which involve perception, reasoning and learning.

UNIT - I

Introduction: The AI Problems - AI Technique - The Level of the Model - Criteria for Success - Defining the problem as a State Space Search - Production Systems - Problem Characteristics - Production System Characteristics.

UNIT - II

Heuristic Search Techniques: Generate-and-Test - Hill Climbing - Best-first Search - Problem Reduction - Constraint Satisfaction - Means-ends Analysis.

UNIT - III

Knowledge Representation Issues: Representations and Mappings - Approaches to Knowledge Representation - Issues in knowledge Representation - The Frame Problem - **Predicate Logic:** Representing Simple Facts in Logic - Representing Instance and ISA Relationships - Computable Functions and Predicates - Resolution - **Representing Knowledge Using Rules:** Procedural Versus Declarative Knowledge - Logic programming - Forward Versus Backward Reasoning - Matching - Control Knowledge.

UNIT - IV

Game Playing: Overview - The Minimax Search Procedure - Adding Alpha-beta Cutoffs - Additional Refinements - Iterative Deepening - **Planning:** Components of a Planning System - Goal Stack Planning - Nonlinear Planning Using Constraint Posting - Hierarchical Planning - Reactive Systems.

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UNIT - V

Perception and Action: Real-time Search - Perception - Action - Robot Architectures - **Expert Systems:** Representation and Using Domain Knowledge - Expert System Shells - Explanation - Knowledge Acquisition.

Textbook:

Elaine Rich, Kevin knight, Shivashankar B Nair , Artificial Intelligence , Third Edition, McGraw Hill Education, Thirteenth Reprint 2014.

Books for Reference:

1. Stuart Russell, Peter Norvig, Artificial Intelligence - A Modern Approach, Second Edition, Prentice Hall of India, 2003.
2. Dan W Patterson, Introduction to AI and Expert Systems, Prentice Hall of India, New Delhi, 2010.
3. Nils J. Nilsson, Artificial Intelligence: A new Synthesis, Harcourt Asia Pvt. Ltd, 2000. George F. Luger, Artificial Intelligence - Structures and Strategies for Complex Problem Solving, Second Edition, Pearson Education, 2008.
4. J. Nilsson, Artificial Intelligence: A new Synthesis, Elsevier Publishers, 1998.

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SEMESTER - VI

Course: Elective - III - C: Software Engineering **Hours per week: 6**

Course Code: 15UALET608 **Credit: 4**

Objective:

To enable the students to learn the Software Engineering Principles.

UNIT - I

Introduction to Software Engineering: The Evolving Role of Software - Software - Software Myths - **A Generic View of Process:** Software Engineering - A Layered Technology - A Process Framework - The Capability Maturity Model Integration (CMMI) - **Process Models:** Prescriptive Models - The Waterfall Model - Incremental Process Models - Evolutionary Process Models.

UNIT - II

Requirements Engineering: Requirements Engineering Tasks - Initiating the Requirements Engineering Process - Eliciting Requirements - Developing Use-Cases - Building the Analysis Model - Negotiating Requirements - Validating Requirements.

UNIT - III

Building the Analysis Model: Data Modeling Concepts - Scenario-Based Modeling - Flow Oriented Modeling - Class-Based Modeling - Creating a Behavioral Model - **Design Engineering:** Design Concepts - The Design Model.

UNIT - IV

Testing Strategies: A Strategic Approach to Software Testing - Test Strategies for Conventional Software - Validating Testing - System Testing - **Testing Tactics:** Software Testing Fundamentals - White-Box Testing - Basis Path Testing - Control Structure Testing - Black-Box Testing.

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UNIT - V

Quality Management: Quality Concepts - Software Quality Assurance - Software Reviews - Formal Technical Reviews - Formal Approaches to SQA - Statistical Software Quality Assurance - Software Reliability - The ISO 9000 Quality Standards - The SQA Plan.

Textbook:

Roger S.Pressman, Software Engineering - A Practitioner's Approach, Sixth Edition McGraw - Hill International Edition, 2005.

Books for Reference:

1. Sommerville, Software Engineering, Eighth Edition, Pearson Education Limited, 2007.
2. Ali Behforooz and Frederick J.Hudson, Software Engineering Fundamentals, Indian Edition, Oxford University Press, Fifth Impression 2008.
3. James F.Peters, Witold Pedrycz, Software Engineering - An Engineering Approach, Wiley India Edition, John Wiley & Sons Inc., Reprint 2007.
4. Pankaj Jalote, An Integrated Approach Software to Engineering, Third Edition, Narosa Publishing House, New Delhi, Tenth Reprint 2008.
5. Richard Fairley, Software Engineering Concepts, Tata McGraw-Hill Edition, 35th Reprint 2011.

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SEMESTER - VI

Course: Project Work **Hours per week: 4**

Course Code: 15UALCV609 **Credit: 4**

GUIDELINES FOR PROJECT WORK

GENERAL

- Student has to take up the project work for a period of six months.
- The project may be developed using the software package that they have learned from the courses studied or implementation of any innovative idea.
- Guide will be allocated to each student and the project title should be approved by the guide.
- The project work should be compulsorily done in the college only under the supervision of the department staff concerned.
- Students should communicate with their guides regularly about the progress of the project.
- Review Presentation is to be given only on the approval of the guide.
- Rough Draft report should be submitted to their guides after 10 days from Review - II.
- Students should submit one copy of the fair draft report in the form of hard binding during the End Semester Examination after they are duly signed by the concerned guides and the Head of the Department.
- No Students will be permitted to appear for viva voce without the project report.
- The impressions on the typed copies should be black in colour. The font and size should be: **'TimesNewRoman - 12 point'.**
- One and a half spacing should be used for typing the general text and all paragraphs should be justified. The margins should be: Left - 1.25'', Right - 1", Top and Bottom - 0.75". The format for typing Chapter headings, Division headings and Sub-division headings are explained by the following illustrative

Chapter Heading : CHAPTER 1

INTRODUCTION

Division Heading : 1.1 SYSTEM SPECIFICATION

1.1.1 HARDWARE CONFIGURATION

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- All page numbers should be typed in Arabic numbers and the preliminary pages should be numbered in lower case Roman numerals.
- Cover wrapper should be in Silver Grey colour.
- The specimen is annexed along with the Project guidelines.

DISTRIBUTION OF INTERNAL MARKS

S.No.	Parameters	Maximum Marks
1.	Review - I	10
2.	Review - II	15
Total		**25**

DISTRIBUTION OF EXTERNAL MARKS

S.No.	Parameters	Maximum Marks
1.	Project Work	50
2.	Viva voce	25
Total		**75***

* Jointly evaluated by Internal and External Examiners.

A candidate who secures not less than 40% in the end semester examination (external) and 40% marks in the external examination and continuous internal assessment put together shall be declared to have passed the examination in the course .

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(A typical Specimen of Cover Page & Title Page)
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PROJECT WORK
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TITLE OF THE PROJECT WORK
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Bonafide Work Done by
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STUDENT NAME

REG. NO. :
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A project report submitted in partial
fulfilment of the requirements for the award of
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BACHELOR OF SCIENCE IN COMPUTER TECHNOLOGY
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Under the guidance of
< Font Size - 14>

NAME OF THE GUIDE
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[Designation]
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Department of Computer Technology and Information Technology
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KONGU ARTS AND SCIENCE COLLEGE
(Autonomous)
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Affiliated to Bharathiar University, Coimbatore
Approved by UGC & AICTE and Re-accredited by NAAC
ISO 9001:2015 Certified Institution
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ERODE - 638107
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[MONTH & YEAR]
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KONGU ARTS AND SCIENCE COLLEGE
(Autonomous)
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Department of Computer Technology and Information Technology
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PROJECT WORK
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TITLE OF THE PROJECT WORK
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Bonafide Work Done by
< Font Size - 14>

STUDENT NAME
REG. NO. :
< Font Size - 14 Bold>

A project report submitted in partial
fulfilment of the requirements for the award of
< Font Size - 14>

Bachelor of Science in Computer Technology
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Guide **Head of the Department**

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Submitted for the Viva-Voce Examination held on _____
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Internal Examiner **External Examiner**

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(A typical Specimen of Contents Page)

CONTENTS

CHAPTER NO	TITLE	PAGE NO
1.	INTRODUCTION	
	1.1 ORGANIZATION PROFILE	
	1.2 SYSTEM SPECIFICATION	
	1.2.1 HARDWARE CONFIGURATION	
	1.2.2 SOFTWARE SPECIFICATION	
2.	**SYSTEM STUDY**	
	2.1 EXISTING SYSTEM	
	2.1.1 DRAWBACKS	
	2.2 PROPOSED SYSTEM	
	2.2.1 FEATURES	
3.	**SYSTEM DESIGN AND DEVELOPMENT**	
	3.1 FILE DESIGN	
	3.2 INPUT DESIGN	
	3.3 OUTPUT DESIGN	
	3.4 DATABASE DESIGN	
	3.5 SYSTEM DEVELOPMENT	
	3.5.1 DESCRIPTION OF MODULES	
	(Detailed explanation about the project work)	
4.	**TESTING AND IMPLEMENTATION**	
5.	**CONCLUSION**	
	BIBLIOGRAPHY	
	APPENDICES	
	A. DATA FLOW DIAGRAM	
	B. TABLE STRUCTURE	
	C. SAMPLE CODING	
	D. SAMPLE INPUT	
	E. SAMPLE OUTPUT	

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SEMESTER - VI

Course:

Skill Based Course 4 (Lab): CASE Tools and Software Testing Lab **Hours per week: 3**

Credit: 3

Course Code: 15UALSP610

1. Design a student mark analysis system using UML diagram and to generate C++ code.
2. Design a railway reservation system using UML diagram and to generate C++ code.
3. Design a stock maintenance system using UML diagram and to generate C++ code.
4. Design an E-mail client server system using UML diagram and to generate C++ code.
5. Design an ATM transfer system using UML diagram and to generate C++ code.
6. Write the test cases for banking application.
7. Analyze the reasons for the failure of the matrix multiplication program.
8. Perform the Win Runner Testing tool and analyze the suitable problem and results.
9. Perform the Quick Test Professional tool and analyze the suitable problem and results.
10. Perform the Silk Test Testing tool and analyze the suitable problem and results.

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ACTIVITIES

KONGU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)

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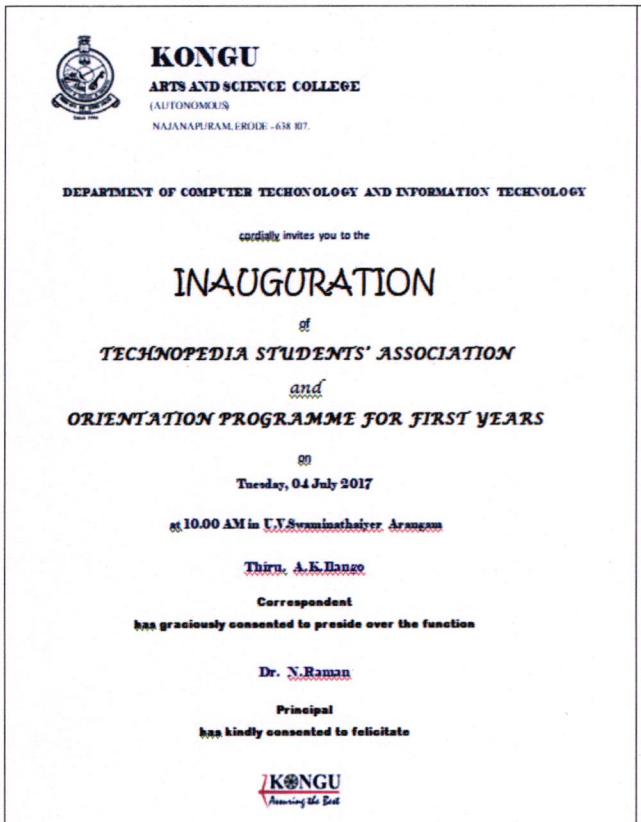
DEPARTMENT OF COMPUTER TECHNOLOGY AND INFORMATION TECHNOLOGY

Inauguration of Technopedia Students' Association and Orientation Programme for First Years



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DEPARTMENT OF COMPUTER TECHONOLOGY AND INFORMATION TECHNOLOGY

cordially invites you to the

INAUGURATION

of

TECHNOPEDIA STUDENTS' ASSOCIATION

and

ORIENTATION PROGRAMME FOR FIRST YEARS

on

Tuesday, 04 July 2017

at 10.00 AM in U.V.Swaminathaiyer Arangam

Thiru. A.K.Ilango

Correspondent

has graciously consented to preside over the function

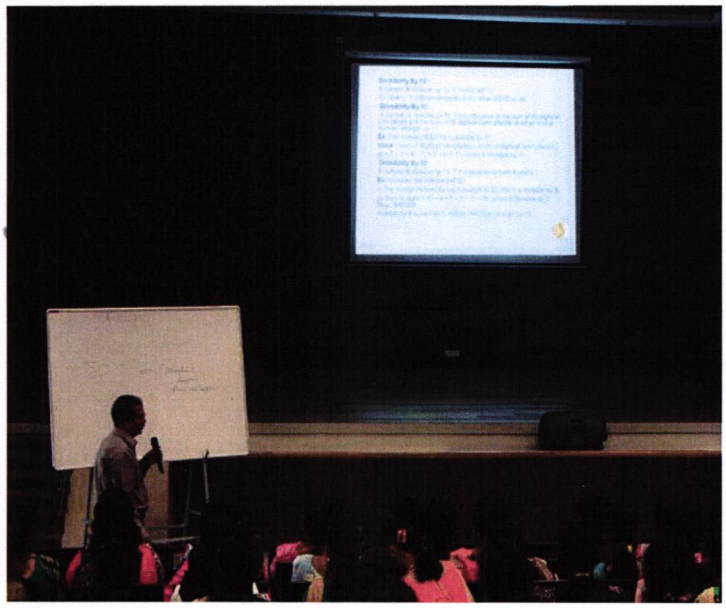
Dr. N.Raman

Principal

has kindly consented to felicitate

KONGU
Nurturing the Best

The Inauguration of Technopedia Students' Association and Orientation Programme for First Years was organised by the Department of Computer Technology and Information Technology on 04.07.2017. The first session of the Orientation Programme on "Bridging the Gap" was handled by Mr.S.Muruganantham, HOD of CT and IT and the second session of the Orientation Programme on "Art of Communication" was handled by Ms.N.Renuka, Assistant Professor of English on 04.07.2017. The third session on "Fundamentals of Mathematics" was handled by Dr. S.Nagarajan, Head Department of Mathematics on 05.07.2017. The fourth session on "Basics of IT" was handled by Ms.C.Indrani, Assistant Professor, Department of CT & IT on 05.07.2017. The fifth session on "Fundamentals of Programming" was handled by Dr.R.Rooba, Assistant Professor, Department of CT&IT on 05.07.2017. The Personality Development Programme as part of the Orientation Programme for first years was conducted by Mr. D.Nagarajaprabu, Technical Lead, IDP Australia, Chennai, on 06.07.2017. The resource person covered topics such as Self Introduction, Word Games, Goal Setting, Time Management and he inspired the students through motivational videos and his speech.



HEAD OF THE DEPARTMENT
DEPARTMENT OF COMPUTER TECHNOLOGY
AND INFORMATION TECHNOLOGY
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