

BHARATHIAR UNIVERSITY, COIMBATORE 641 046.
Master of Computer Applications (MCA) Univ. Dept.
(MCA- Effective from the academic Year 2017-2018)
(MCA Lateral Entry- Effective from the academic Year 2017-2018)

Scheme of Examinations

Core/ Elective/ Supportive/ Project	Suggested Code	Sem	Title of the Paper	L	P	Credits	Marks
Core	17CSEAC01	I	C Programming & Data Structures	4	0	4	100
Core	17CSEAC02	I	Computer Organization & Architecture	4	0	4	100
Core	17CSEAC03	I	Operating Systems	4	0	4	100
Core	17CSEAC04	I	Mathematics for Computing	4	0	4	100
Core	17CSEAC05	I	C Programming & Data Structures Lab	0	4	4	100
Core	17CSEAC06	I	Operating Systems Lab	0	4	4	100
Core	17CSEAC07	II	Design and Analysis of Algorithms & Object Oriented Programming	4	0	4	100
Core	17CSEAC08	II	Operations Research	4	0	4	100
Core	17CSEAC09	II	Relational Data Base Management System	4	0	4	100
Core	17CSEAC10	II	Software Engineering	4	0	4	100
Core	17CSEAC11	II	Design and Analysis of Algorithms & Object Oriented Programming Lab	0	4	4	100
Core	17CSEAC12	II	Relational Database Management System Lab	0	4	4	100
Core	17CSEAC13	III	Advanced Java Programming	4	0	4	100
Core	17CSEAC14	III	Computer Networks	4	0	4	100
Core	17CSEAC15	III	Software Project Management	4	0	4	100
Core	17CSEAC16	III	Computer Security and Cryptography	4	0	4	100
Core	17CSEAC17	III	Soft Skills – I	2	0	2	50
Core	17CSEAC18	III	Advanced Java Programming Lab	0	4	4	100
Core	17CSEAC19	III	Computer Networks Lab	0	4	4	100
Core	17CSEAC20	III	Soft Skills – I Lab	0	2	2	50
Supportive	17CSEGSXX	III	General Supportive		2	2	50
Core	17CSEAC21	IV	Open Source Programming	4	0	4	100
Core	17CSEAC22	IV	Mobile Programming	4	0	4	100
Core	17CSEAC23	IV	Computer Graphics and Multimedia	4	0	4	100
Elective	17CSEAEXX	IV	Elective – I			4	100
Core	17CSEAC24	IV	Open Source Programming Lab	0	2	2	50
Core	17CSEAC25	IV	Mobile Programming Lab	0	3	3	75
Core	17CSEAC26	IV	Computer Graphics and Multimedia Lab	0	3	3	75
Supportive	17CSEGSXX	IV	General Supportive			2	50
Core	17CSEAC27	V	Internet Programming and Web Designing	4	0	4	100
Core	17CSEAC28	V	Data Mining	4	0	4	100
Core	17CSEAC29	V	Soft Skills – II	2	0	2	50
Elective	17CSEAEXX	V	Elective – II			4	100
Elective	17CSEAEXX	V	Elective – III			4	100
Core	17CSEAC30	V	Internet Programming and Web Designing Lab	0	4	4	100
Core	17CSEAC31	V	Data Mining Lab	0	4	4	100
Core	17CSEAC32	V	Soft Skills – II Lab	0	2	2	50
Supportive	17CSEGSXX	V	General Supportive			2	50
Mini-Project	17CSEAC33	V ^{summer}	Mini Project and Viva Voce			2	50
Project	17CSEAC34	VI	Project Work And Viva Voce			10	250
			Total			146	3650

Electives for MCA (CBCS)

Elective	Suggested Code	Title of the Paper	L	P
Networking and Distributed Systems				
Elective	17CSEAE40	Wireless Sensor Networks	4	0
Elective	17CSEAE41	Mobile Networking	4	0
Elective	17CSEAE42	Grid and Cloud Computing	4	0
Elective	17CSEAE43	Internet of Things	4	0
Database Technologies				
Elective	17CSEAE44	Data Analysis and Business Intelligence	4	0
Elective	17CSEAE45	Big Data Technologies	4	0
Elective	17CSEAE46	NoSQL I – Mongo DB	4	0
	17CSEAE47	NoSQL I – Mongo DB Lab	0	2
Elective	17CSEAE48	NoSQL II – Neo 4j	4	0
	17CSEAE49	NoSQL II – Neo 4j Lab	0	2
Intelligent Systems				
Elective	17CSEAE50	Image Processing	4	0
Elective	17CSEAE51	Soft Computing	4	0
Elective	17CSEAE52	Intelligent Agents	4	0
Elective	17CSEAE53	Machine Learning	4	0
Elective	17CSEAE54	Embedded Systems	4	0
	17CSEAE55	Embedded Systems Lab	0	2
Web Technologies				
Elective	17CSEAE56	Semantic Web	4	0
Elective	17CSEAE57	Service Oriented Architecture and Web Services	4	0
Elective	17CSEAE58	Social Networking and Web Mining	4	0
Advanced Programming				
Elective	17CSEAE59	Python Programming	4	0
	17CSEAE60	Python Programming Lab	0	2
Elective	17CSEAE61	.NET Programming	4	0
	17CSEAE62	.NET Programming Lab	0	2
Elective	17CSEAE63	Graphical Programming and Virtual Instrumentation	4	0
	17CSEAE64	Graphical Programming and Virtual Instrumentation Lab	0	2
Elective	17CSEAE65	Accounting and Financial Management	4	0
Elective	17CSEAE66	Organizational Behavior	4	0
Elective	17CSEAE67	Marketing Management	4	0
Elective	17CSEAE68	Finalytics	4	0

There is no change in the Unitwise syllabus of Elective Courses

Course Title: C PROGRAMMING AND DATA STRUCTURES

Course Number: 17CSEAC01

Number of Credits: 4

Subject Description

This course presents the Programming techniques in C, explains data types, arrays, pointers, files and gives the basics of various data structures

Goal

To enable the students to learn the basic functions, principles and concepts of programming in C and fundamentals of data structures.

Objectives

On successful completion of the course the students should have:

- Understood the Programming in C language
- Understood the various Data structures for representation of structures and searching

Contents

UNIT I

An overview of C - data types and sizes - declarations - variables - constants - operators - hierarchy of operators - C expressions - precedence and order of evaluation - program control structure - the loop control structures. – Storage classes.

UNIT II

Arrays - strings – Functions - function prototypes - recursion - structures - array of structures – additional features of structures - difference between array and structures - structure in functions - self referential structures - unions

UNIT III

Pointers – array of pointers – pointers to an array – pointer to pointers – pointers to functions – function returning pointers - pointers to structure - problems with pointers. Files – Sequential and random accessing - command line arguments - C preprocessor.

UNIT IV

Stacks & Recursion: Stacks-Introduction to Recursion- Principles of Recursion- Polish Notation-Evaluation of Polish Expression-Translation from Infix form to polish form. Queues: -Circular queues -Polynomial Arithmetic. Linked Lists: Single Linked List – Doubly Linked list.

UNIT V

Trees & Graphs: Binary Search Trees - AVL Trees - B-Trees. Graphs: Definitions- Undirected & Directed Graphs- Traversal-Topological Sorting-Shortest Paths. Tables : Tables of various shapes- Abstract Tables- Radix sort- Hashing

REFERENCES

1. Yashvant P. Kanetkar, „ Let Us C“, BPB Publications, 2002.
3. E. Balagurusamy, 'Programming in ANSI C', Tata McGraw Hill, 2004
4. Byron C Gotfried, Programming with C, Schuams“ outline series, 2nd edition, Tata McGraw Hill,2006..
5. S. Thamaraiselvi G. Murugesahan, „C for all“, Anuradha agencies.
6. Robert A. Radcliffe, 'Encyclopedia C' BPB Publications.
7. Brain W. Kernighan, Dennis M.R. Chie, 'The C Programming Language' Prentice Hall, 1990.
8. Gottfried, B. 'Theory and Problems of Programming with C', McGraw Hill, 1990.

Course Title: COMPUTER ORGANIZATION AND ARCHITECTURE

Course Number: 17CSEAC02

Number of Credits: 4

Subject Description:

This course presents the architecture and organization of computers.

Goal:

To enable the students to learn the basic functions, principles and concepts of Computer architecture.

Objectives:

On successful completion of the course the students should have:

- Understood data representation
- Understood computer arithmetic, register and I/O organization

Contents

UNIT I

Data representation: Data types – Complements – Fixed – pointer presentation – Floating - point representation –Logic gates-Combinational circuits- Flip-flops –Multiplexers–Decoders.

UNIT II

Registers – Shift registers – Binary counters – Register transfer – Bus and memory transfers – Arithmetic micro operations – Logic and shift micro operations-Arithmetic logic shift unit.

UNIT III

CPU: Register and stack organization – Instruction formats – Addressing modes – Data transfer and manipulation –Program control–RISC.

UNIT IV

Computer arithmetic: Addition, subtraction, multiplication and division of signed - magnitude data. Parallel processing: Pipelining–Arithmetic and instruction pipeline–RISC pipeline–Array Processors.

UNIT V

Input-output organization: Peripheral devices–I/O interface –Asynchronous data transfer. Memory organization: Memory hierarchy–Main memory–Auxiliary memory–Associative memory–Cache memory–Virtual memory.

REFERENCES

1. M. Morris Mano, “Computer System Architecture”, 3rd Edition, Pearson Education, 2007.
2. John P Hayes, “Computer Architecture and Organization”, 4th Edition, McGraw-Hill Book Company, 2012.
3. M Morris Mano, “Digital Logic and Computer Design”, 1st Edition, Pearson Education, 2016.
4. Malvino A. P., Donald P. Leach, Goutam Saha, “Digital Principles and Applications”, 8th Edition, McGraw Hill Publications, 2014.
5. William Stallings, “Computer Organization and Architecture”, Pearson Education, 10th edition, 2016.

Course Title: OPERATING SYSTEMS

Course Number: 17CSEAC03

Number of Credits: 4

Subject Description

This course presents the Introduction about operating systems, process management, CPU scheduling, memory management, secondary storage management.

Goal

To enable the students to learn the basic functions, principles and concepts operating system.

Objectives

On successful completion of the course the students should have:

- Understood the operating system principles
- Understood the Principles of Deadlock, processor scheduling and memory management.
- Learnt case studies in different OS

UNIT I

Introduction: Operating System, Types of Operating System. Process: Process Concept – Hierarchy of Process – Critical Section Problem – Semaphores – Inter Process Communication. CPU Scheduling. Deadlock: Deadlock Problem, Characterization, Prevention, Avoidance - Detection - Recovery.

UNIT II

Memory Management: Basics – Swapping – Virtual Memory – Page Replacement Algorithms – Segmentation. Input/output: Principles of I/O Hardware and Software – Discs – Clocks – Graphical User Interface. File Systems: Files – Directories – File System Implementation. Protection and Security Overview.

UNIT III

Linux System: Introduction – Programming Linux. Shell Programming: What is Shell? – Pipes and Redirection – The Shell as a Programming Language – Shell Syntax – The Dialog Utility. Working with Files: Linux File Structure – System Calls and Device Drivers – Library Functions – Low-Level File Access – The Standard i/o Library – Formatted Input Output – File and Directory Maintenance – Scanning Directories.

UNIT IV

The Linux Environment: Program Arguments – Environment Variable – time and Date – Temporary Files – User Information – Host Information – Logging – Resources and Limits. Terminals: Reading from and Writing to the Terminal – Talking to the Terminal – The Termios Structure – Terminal Output – Detecting Keystrokes.

UNIT V

The vi Editors: vi Text Editor – Simple Editing – Advance Editing. The vim Editor: Creating and Editing File with vim – Introduction to vim Features – Moving Cursor in Command Mode– Deleting and Changing Text in Command Mode – Input Mode – Searching and Substituting – Copying, Moving and Deleting Text - Reading and Writing Files – Advanced Editing Techniques.

REFERENCES

1. Andrew S. Tanenbaum, HebrertBos, “Modern Operating Systems”, 4th Edition, Pearson Publication, 2015.
2. Abraham Silberschatz, Peter Baer Galvin and Greg Gage, “Operating System Concepts”, 9th Edition, John Wiley and Sons Inc., 2012.
3. Richard Stones, Neil Matthew, “Beginning: Linux Programming” 4nd Edition, 2007.
4. Mark G. Sobell “A Practical Guide to Linux commands, Editors, and Shell Programming”, 2nd Edition, Pearson, 2011.
5. Arnold Robbins, Elbert Hannab and Linda Lamb, “Learning the vi and vim Editors” 7th Edition O’Reilly, 2008.

Course Title: MATHEMATICS FOR COMPUTING
Course Number: 17CSEAC04

Number of Credits: 4

Subject Description

This course presents the basics of Probability Theory, Regression, Stochastic models and theoretical distributions

Goal

To enable the students to learn the basic functions, principles and concepts of probability theory, regression and theoretical distributions.

Objectives

On successful completion of the course the students should have:

- Understood the Probability Theory
- Understood regression and theoretical distributions.

Contents

UNIT I

Basic probability theory - distributions and their properties - Frequency Distribution - Continuous or Grouped Frequency Distribution - Magnitude of Class intervals - Cumulative Frequency Distribution - Two Way Frequency Distribution - Measures of Central Tendency: Arithmetic Mean, Geometric Mean - Harmonic Mean - Median, Mode - Dispersion: Overview - Mean Deviation - Standard Deviation - Combined Standard Deviation.

UNIT II

Regression: Overview - Simple and multiple regression analysis - Regression, Graphical Method - Algebraic Method - Regression Line - Regression Equation, - hypothesis testing - Hypothesis - Standard Error - Test of Significance for Attributes - Test of Significance for Large Samples - Test of Significance for Small Samples - Chi Square Test - sampling - estimation theory - least square methods - SVD - transformations

UNIT III

Stochastic models compression techniques - Markov Models - Markov decision process - application in sequential decision making

UNIT IV

Theoretical Distribution: Binominal Distribution - Obtaining Coefficient - Poisson Distribution - Normal Distribution - Poisson - Cumulative Poisson Process and its generalization - applications in different business domain - ARMA and ARIMA - Monte Carlo Simulations

UNIT V

Application of data analytics in different domains – Exploring Case Studies for the topics given in Unit I to Unit IV.

References

1. R.S.N. Pillai, Bagavathi, “Statistics Theory and Practice, S.Chand& Company, 2013
2. Douglas C. Montgomery, George C. Runger., “Applied Statistics for Engineers”, John Wiley & Sons. Inc, 2003

Course Title: DESIGN AND ANALYSIS OF ALGORITHMS & OBJECT ORIENTED PROGRAMMING

Course Number: 17CSEAC07

Number of Credits: 4

Subject Description: This course presents the features of object oriented programming and design of algorithms.

Goal: To enable the students to learn the principles and concepts of Object oriented programming and apply them in algorithm design.

Objectives

On successful completion of the course the students should have:

- Understood the Object model and relationship among objects
- Gain knowledge in C++programming
- Design algorithms using C++

Contents

UNIT I

Object oriented language fundamentals – programming basics – Conditional statements – Structures – Functions - Objects and Classes – Constructors – Overloading.

UNIT II

Inheritance – Hierarchy - Derived class – Access specification - Polymorphism – virtual functions – virtual class – Files - Exception Handling.

UNIT III

Introduction to algorithms, Analyzing algorithms. Divide and Conquer: General Method, Binary Search, Merge sort, Quick sort.

UNIT IV

Greedy Method: Knapsack problem, Job sequencing with deadlines, Minimum spanning trees, Single source shortest paths. Dynamic Programming: Multistage graphs, All pairs shortest paths, Travelling salesperson problem.

UNIT V

Back Tracking: 8-queens problem, Sum of subsets, Graph coloring, Hamiltonian cycles. Branch and Bound: General method, Travelling salesperson problem.

REFERENCES

1. Bjarne Stroustrup, “The C++ Programming Language”, Addison Wesley, 4th Edition, 2013.
2. Venugopal K R, Rajkumar Buyya, “ Mastering C++”, McGrawHill Education, 4th edition, 2013.
3. Ellis Horowitz, SartajSahni, SanguthevarRajasekaran, “Fundamentals of Computer Algorithms”, Galgotia Publications, 2011.
4. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, “ Introduction to Algorithms”, Massachusetts Institute of Technology, MIT Press, III Edition, 2009.
5. www.spoken-tutorial.org

Course Title: OPERATIONS RESEARCH
Course Number: 17CSEAC08

Number of Credits: 4

Subject Description

This course presents the various principles and applications of operations research and trains the students on solving problems using Operations research methods and EXCEL.

Goal

To enable the students to learn the various principles and applications of operations research

Objectives

On successful completion of the course the students should have:

- Understood linear programming methods
- Understood network analysis methods

Contents

UNIT I

Linear Programming: Introduction, Mathematical Formulations, Solutions, Graphical Method, Simplex Method, Artificial variables, BigM, Two phase methods, Variants in Simplex Method, Duality Theory and Problems, Dual Simplex Method.

UNIT II

Transportation and its variants: Definition, Transportation Algorithms and Solutions, Assignment Model, Hungarian Method, Traveling Salesman Problem, The Transshipment Model – Queueing Theory:- Characteristic of Queueing System, Steady State M/M/I Model Finite.

UNIT III

Inventory Theory: Cost Involved in Inventory Problems, Single Item Deterministic Models, and Economic Size Model with and without Shortages having Production Rate Infinite and Finite.

UNIT IV

PERT and CPM: Arrow Networks, Time Estimates, Various Expected Times, Critical Path, Critical Path Computations, Various Floats of Activities, Updating Projects Operation Time Cost.

UNIT V

Operations Research Models using Spreadsheets – Linear Programming Models: A Manufacturing Example - Computational Considerations - Terminology – Solution Characteristics Network Flow Programming Models: Classical Models – Extensions of the Basic Models - Minimum Cost Flow Problem – Distribution and Networks: anyone Case Study from Routing of goods, electricity and digital data

REFERENCES

1. Handy A Taha, “Operations Research- An Introduction”, Macmillan Publishing Co., 7th Edition (2004).
2. Sharma J K, “Operations Research - Theory and Application”, Mac Millan India: 2003.
3. Srivastava, U.K., Shenoy, G.V., and Sharma, S.C. (2009). Quantitative Techniques for Managerial Decision, 2/e; New Delhi: New Age International
4. Paul A. Jensen and Jonathan F. Bard, Operations Research Models and Methods, John Wiley Inc., 2003 <http://www.me.utexas.edu/~jensen/ORMM>, (for Unit V)

Course Title: RELATIONAL DATABASE MANAGEMENT SYSTEM

Course Number: 17CSEAC09

Number of Credits: 4

Subject Description

This course presents the introduction of database management systems, explains ER model, structure of relational database, indexing and advance data base concepts.

Goal

To enable the students to learn the basic functions, principles and concepts of database management systems.

Objectives

On successful completion of the course the students should have:

- Understood the basic principles of database management systems, parallel & distributed database.
- Gained knowledge over various database models, schemes and SQL statements.

Contents

UNIT I

Introduction – purpose of database system - data models – database languages - Transaction management – Storage management - DBA –database users - system structure, E-R model.

UNIT II

Relational Database Design: Anomalies in Database – Functional Dependency – Lossless Join and

Dependency – Preserving Decomposition – Third Normal Form – BoyceCodd Normal Form

Multivalued Dependency – Fourth Normal Form – Join Dependency – Project Join Normal Form – Domain Key Normal Form. SQL: Data Definition – Data Manipulation – Integrity Constraints– Views–PL/SQL.

UNIT III

Indexing and Hashing – Query Processing – Transaction Processing – Concurrency Control and Recovery.

UNIT IV

Advanced Database Concepts and Emerging Applications: Distributed Databases – Object Oriented Databases - Object Relational Databases- Data mining and Data Warehousing.

UNIT V

DBMS Case Studies: Application of DB concepts in Hospitals or any small and medium scale Industry– DBMS in Hospital management System, Small and Medium Scale Enterprises– Application of DBMS in Marketing

(For Unit V, students are expected to do a survey and study and submit a report)

REFERENCES

1. Abraham Silberchatz, Henry K.Forth, Sudharshan, “Database system Concepts” – (6th edition), McGraw Hill, 2010.
2. Elisa Bertino, “Object Oriented Databases”, Addison Wesley. 1993.
3. RamezElmasri, ShamkantB.Navathe, " Fundamentals of Database Systems ", 3rd Edition, Addison Wesley-2000.
4. Malay k. Pakhira, “Database Management System”, Phi Learning Pvt. Ltd., 2012
5. www.spoken-tutorial.org

Course Title: SOFTWARE ENGINEERING
Course Number: 17CSEAC10

Number of Credits: 4

Subject Description

This course presents the role of software, system analysis, design concepts, methods, testing methods and strategies

Goal

To enable the students to learn the basic functions, principles and concepts of software engineering.

Objectives

On successful completion of the course the students should have:

- Understood the role of software engineering
- Understood the design concepts, testing methods and strategies

Contents

UNIT I

Introduction: Evolving role of software - Software characteristics, components and its applications- Generic view of software engineering –Software process models. System Analysis: Requirements analysis - Analysis principles - Prototyping - Software requirement specification-Data modeling, functional modeling and behavioral modeling.

UNIT II

Design concepts: Design and software quality. Design concepts: Abstraction, refinement, modularity, and software architecture control hierarchy, structural partitioning and information hiding. Effective modular design: functional independence, cohesion and coupling - design documentation

UNIT III

Design Methods: Data design – Architectural design process: transform mapping and transaction mapping – interface design-procedural design.

UNIT IV

Software Testing Methods: Software testing fundamentals. White box, black box testing: basispath testing and control structure testing- Software Testing Strategies: A strategic approach to software testing –unit testing-integration testing-validation testing-system testing - Static Testing Vs. Structural Testing -Testing Client/Server Systems – Rapid Application Development Testing – Testing in a Multiplatform Environment – Testing Software System Security - Testing Object-Oriented Software – Object Oriented Testing – Testing Web based systems – Web based system – Web Technology Evolution – Traditional Software and Web based Software – Challenges in Testing for Web-based Software – Testing a Data Warehouse.

UNIT V

Software Engineering Case Studies: Application of SE concepts in Hospitals or any small and medium scale Industry –SE in Hospital management System, Small and Medium Scale Enterprises– Application of SE in Marketing (For UnitV, students are expected to do a survey and study and submit a report).

REFERENCES

1. R. S. Pressman, “Software Engineering”, (7th edition), Tata McGraw Hill, 2009, ISBN - 10: 0073375977.
2. R. S. Pressman, “Software Engineering”, (5th edition), Tata McGraw Hill, 1997.
3. PankajJalote, “An Integrated Approach to Software Engineering”, Third Edition, Narosa Publishing House, 2005.
4. Richard F Schmidt, “Software Engineering: Architecture-driven Software Development”, 2013.
5. Stephen Kan, “Metrics and Models in Software Quality”, Addison – Wesley, Second Edition, 2004.
6. LleneBurnstein, “ Practical Software Testing”, Springer International Edition, Chennai, 2003.
7. RenuRajani,Pradeep Oak, “Software Testing – Effective Methods, Tools and Techniques”, Tata McGraw Hill,2004.
8. Edward Kit, “Software Testing in the Real World – Improving the Process”, Pearson Education, 1995

Course Title: ADVANCED JAVA PROGRAMMING
Course Number: 17CSEAC13

Number of Credits: 4

Subject Description

This course presents a detailed study on the Advanced java concepts including MVC Architecture of Java, Database Connectivity, Remote Method Invocation, Java Servlets, Java Server Pages and an overview on JQuery, AJAX.

Goal

To enable the students learn the advanced concepts of Java programming and to design web based as well as distributed applications in Java.

Objectives

On successful completion of the course the students should have:

- Gained knowledge in web page designing, component designing and designing distributed applications using Java.

Contents

UNIT I

Collections Framework: Collection classes and Interfaces – Legacy classes – Date – Calendar – Time Zone. **Event Handling:** Exploring Swing – JFrame – JComponent – Text Fields – Buttons – Combo boxes – Application design using Swing components.

UNIT II

Database Programming in Java: Overview of the JDBC Process - JDBC Concepts - JDBC Drivertypes – Database Connection- JDBC/ODBC Bridge – Statement Objects – The Connection Interface – Result Set – Interacting with the database - Transaction Processing.

UNIT III

Java Networking: Remote Method Invocation (RMI)-Distributed Application Architecture– Client proxy and Server Proxy – RMI process - Defining and using Remote objects.

UNIT IV

Java Servlets: Servlets - Initialization–Deployment–Reading Client Data–Reading HTTP Request Headers – Cookies - Session Tracking – Database Connections.

Java Server Pages (JSP) - JSP tags - Components of a JSP page - Expressions–Scriptlets – Directives – Declarations - Working with JSP- JSP and JDBC- JQuery - AJAX.

UNIT V

Application Development Environment: Overview of MVC architecture – **Struts:** Working principle of Struts – Building model components – View components – Controller components –Developing Web applications – **Spring:** Framework – Controllers – Developing simple applications.

REFERENCES

1. Herbert Schildt, “The Complete Reference Java”, Tata McGrawHill Publishing Company Ltd, 2012.
2. Marty Hall, Larry Brown, Yaakov Chaikin, “Core Servlets and Java Server pages”: Volume 2 – Advanced Technologies, II edition, Pearson education, 2008.
3. Jamie Jaworskie, ”Java 2 Platform Unleashed”, Techmedia SAMS, IV edition, 2008.
4. Craig Walls, “Spring in Action”, IV edition, Manning Publications, 2015.
5. www.spoken-tutorial.org

Course Title: COMPUTER NETWORKS
Course Number: 17CSEAC14

Number of Credits: 4

Subject Description

This course presents the introduction to networks and communication media, data transfer, network layer protocols, transport protocols and presentation layer.

Goal

To enable the students to learn the basic functions, principles and concepts of computer networks.

Objectives

On successful completion of the course the students should have:

- Understood the functionality of networks protocols and layers
- Understood network simulation using NS2

Contents

UNIT I

INTRODUCTION TO NETWORKS & COMMUNICATION MEDIA: Uses – Network hardware– Network software–Reference Models–Example Networks: Internet–X.25-ATM-Transmission media–Wireless Transmission–Telephone system–ISDN, ATM communication –Satellite communication.

UNIT II

DATA TRANSFER & ACCESS PROTOCOLS: Error detection and correction methods– Elementary protocols –Sliding window protocols - IEEE 802.2 Logical Link Control – Bluetooth: architecture– protocol stack– radio layer– baseband layer– L2CAP layer– frame structure.

UNIT III

NETWORK LAYER PROTOCOLS: Routing algorithms –Congestion control: Principles – policies–Congestion control in VC subnets – congestion control in datagram subnets– Network layer in Internet: Architecture–IP protocol–IP Address–IPv6.

UNIT IV

TRANSPORT PROTOCOLS: Transport service–Transport protocols–Transport protocols in Internet: TCP and UDP

UNIT-V

APPLICATION LAYER ISSUES:-Domain Name System –Electronic mail–Network security. Network Simulator: Basics of Computer Network Simulation –Introduction to Network Simulator2 (NS2) – Basic Architecture–Installation– Directories and Convention–Running NS2 Simulation–Simulation Examples

REFERENCES

1. Andrew S. Tanenbaum, “Computer Networks”, PHI, 5th Edition, 2013
2. Behrouz A. Forouzan, “Data communication and Networking”, Tata McGraw-Hill, 4th Edition, 2006
3. William Stallings, “Data and Computer Communication”, 7th Edition, Pearson Education, 2007
4. Teerawat Ussaruyakul, Ekram Hossain, Introduction to Network Simulator NS2, Springer, 2009

Course Title: SOFTWARE PROJECT MANAGEMENT
Course Number: 17CSEAC15

Number of Credits: 4

Subject Description

This course presents the introduction to software projects, activity planning, risk management, software configuration management.

Goal

To enable the students to learn the basic functions, principles and concepts of Software project management.

Objectives

On successful completion of the course the students should have:

- Understood the Software configuration management
- Understood the Activity Planning, Risk Management using case studies

Contents

UNIT I

Introduction to Software Projects – An Overview of Project Planning–Project Evaluation– Selection of an appropriate Project approach–Software effort Estimation.

UNIT II

Activity Planning –Project Schedules –Sequencing and Scheduling Projects –Network Planning Model –forward and backward pass-Identifying the Critical path-Activity float-Shortening Project Duration–Identifying Critical Activities – precedence networks. Risk Management – Resource Allocation – Monitoring and Control.

UNIT-III

Software testing Fundamentals – Test case Design – Introduction of Black Box Testing and White Box testing – Flow Graphs and Path testing – Path testing Basics - Predicates, Path Predicates and Achievable Paths - Path Sensitizing – Path Instrumentation – Implementation and Application of Path Testing.

UNIT IV

Logic Based Testing – Motivational Overview – Decision tables – Path Expressions – KV Charts – Specifications – States, State Graphs and transition Testing – State Graphs – Good & bad states – state testing Metrics and Complexity.

UNIT-V

Case Studies –Application of SPM concepts in Hospital information systems or information systems of any small and medium scale Industry– SPM in Hospital information management System, Small and Medium Scale Enterprises–Application of SPM in Marketing.
(For Unit V, students are expected to do a survey and study and submit a report)

REFERENCES

1. Mike Cotterell, Bob Hughes, “Software Project Management”, Inclination/Thomas Computer Press, 1995.
2. Darrel Ince, H.Sharp and M.Woodman, “Introduction to Software Project Management and Quality Assurance”, Tata McGraw Hill, 1995.
3. Ramesh Gopaldasamy, “Managing Global Software Projects”, 2005.
4. S. A. Kelkar, “Software Project Management: A Concise Study”, PHI Learning Pvt. Ltd., Dec-2012
5. PMBOK, Project management body of knowledge www.pmi.org
6. Marnie. L. Hutcheson, Software Testing Fundamentals, Wiley-India,2007
7. Boris Beizer, Software testing techniques, Dreamtech Press, Second Edition -2003
8. Bob Hughes and Mike Cotterell”, Software Project Management , Second Edition-Mc Graw Hill, 1999
9. Andrew Stellman and Jennifer Greene “,Applied Software Project Management”, O’Reilly ,2006

Course Title: COMPUTER SECURITY AND CRYPTOGRAPHY

Course Number: 17CSEAC16

Number of Credits: 4

Subject Description

This course presents the introduction to encryption, cryptography, system security, database security and ethical issues in computer security.

Goal

To enable the students to learn the basic concepts in cryptography, security mechanisms and ethical issues in computer security.

Objectives

On successful completion of the course the students should have:

- Understood the concepts in encryption, cryptography
- Understood the concepts of system security and database security
- Understood the ethical issues in computer security

Contents

Unit-I

Introduction: Introduction to security attacks - services and mechanism - introduction to cryptography - Classical Encryption Techniques – Network Security Model – Data Encryption Standard-Triple DES-block cipher modes of operations –Different types of ciphers- Electronic Mail Security-IP Security- Web Security

Unit-II

Public Key Cryptography: Number Theory concepts – Primality – Modular Arithmetic – Fermat & Euler Theorem – Euclid Algorithm – RSA Algorithm – Elliptic Curve Cryptography – Diffie Hellman Key Exchange - Cryptographic hash functions - Cipher Block Chaining - Secure Hash Algorithm - Digital Signature: Schnorr Digital Signature Scheme -Digital Signature Standard – Kerberos

-

Unit-III

System Security: Intruders-Intruder detection-Password management- Viruses- virus countermeasures-worms-DOS attack- Types of Firewalls – Firewall Designs – SET for E-Commerce Transactions -Secure Socket Layer-Security standards

Unit-IV

Operating System and Database Security: Internet Key Exchange (Phases of IKE), PGP - Access Control – File Protection mechanism- User authentication-Wireless application protocol (WAP) – Protocol overview – Detecting conficker with Nmap- Security Requirements- Multilevel database.

Unit-V

Ethical and Legal Issues in Computer Security: Cybercrime- Computer crime-Copyrights- patents- Information and law-Ethical issues-case studies.

REFERENCES

1. William Stallings, “Cryptography & Network Security”, Pearson Education, 5th edition. New Delhi 2005.
2. Charles P. Pfleeger, Shari L. Pfleeger, “Security in Computing”, Prentice Hall, 4th edition. 2003.

Course Title: SOFT SKILLS – I

Course Number: 17CSEAC17

Number of Credits: 2

Subject Description:

This course presents an introduction to communication skills, soft skills, technical programming skills and quantitative aptitude.

Goal:

To enable the students to learn the basics of communication skills, soft skills, technical programming skills and quantitative aptitude.

Objectives

- On successful completion of the course the students should have:
- Understood the basics of communication skills and soft skills
- Acquired knowledge in technical programming and quantitative aptitude

Contents

UNIT I

Introduction to Communication – Importance – Basics of Communication – Purpose and Audience - Language as a Tool of Communication – Communicative Skills - Modes of Communication – Active Listening-Introduction - Traits of a Good Listener – Listening Modes – Effective Speaking: Achieving Confidence, Clarity and Fluency – Paralinguistic Features – Types of Speaking.

UNIT II

Personality Development: A Must for Leadership and Career Growth – Swami Vivekananda’s Concept of Personality Development – Interpersonal Skills -Soft Skills: Introduction to Soft Skills – Classification of Soft Skills-Case study: Resume writing-Email-letter Writing-Self Introduction.

UNIT III

Technical programming skill: Variables and keywords - Operators in C – Decision Making – Looping - Branching Statements –Array – Functions.

UNIT IV

Quantitative Aptitude1: Number series -Ratio, Proportion and Partnership – Problems on Ages - Average - Profit and Loss.

UNIT V

Quantitative Aptitude2: Simple Interest – Compound Interest – Time and Work – Time and Distance.

REFERENCES

1. Raman Sharma, “Technical Communication”, 2ndEdition, Oxford University Press 2011.
2. Barun K. Mitra“Personality Development and Soft Skills”, Oxford University Press 2011.
3. Dr. Balagurusamy, “Programming in C”, Tata McGraw – Hill Edition, 2008. 4. S. Chand and Ashish Aggarwal, “Quick Arithmetic” Sixth Revised Edition.

Course Title: OPEN SOURCE PROGRAMMING

Course Number: 17CSEAC21

Number of Credits: 4

Subject Description

This course presents the basics of open source software, PHP and MySQL programming

Goal

To enable the students to learn the basics of open source software, PHP and MySQL programming.

Objectives

On successful completion of the course the students should have:

- Understood the overview of open source software.
- Understood the basics of PHP and MySQL programming

Contents

UNIT I

Overview of free/ open source software: history – advantages – disadvantages – Open Source business models– Open Source Licenses: types – MIT license – BSD licenses – dual licensing – Free/ Open source software examples

UNIT II

PHP Programming: Introduction – Syntax – Variables - Controls and functions – Strings - Arrays: Using Arrays, Manipulating Arrays, Associative Arrays – Advanced Array Functions

UNIT III

Object-Oriented Programming with PHP – Strings and Regular Expression Functions – File system and System Functions – Sessions, Cookies and HTTP

UNIT IV

PHP and MySQL: SQL Tutorial – MySQL Database Administration – PHP/MySQL Functions – Displaying Queries in Tables – Building Forms from Queries

UNIT V

PHP and AJAX: introduction – JavaScript and AJAX Client: JavaScript and DOM – XMLHttpRequest Object – AJAX form validation

REFERENCES

1. Dan Woods and Gautam Guliani, 'Open Source for the Enterprise', O'Reilly Media, 2005.
2. Tim Converse and Joyce Park, 'PHP 5 and MySQL Bible' Wiley Publishing, 2004.
3. Bogdan Brinzarea-lamandi, Cristian Darie and Audra Hendrix, 'AJAX and PHP', Packt Publishing, 2009.
4. Joseph Feller, Brian Fitzgerald and Eric S. Raymond, "Understanding Open Source Software Development", Addison -Wesley Professional, 1st Edition, 2001.
5. Jason Gilmore, 'Beginning PHP and MySQL', Dreamtech Press, Fourth Edition, 2010.
6. Rajesh Jeba Anbiah, Roshan Bhattarai and Milan Sedliak, 'PHP Ajax Cookbook', Packt Publishing, 2011.
7. www.spoken-tutorial.org

Course Title: MOBILE PROGRAMMING

Course Number: 17CSEAC22

Number of Credits: 4

Subject Description: This course presents an overview of mobile applications and practice for Android application development.

Goal: This course aims to provide the students with a detailed knowledge on mobile application design using Android and iOS and development using Android.

Objectives: On successful completion of the course, the students should have:

- A good understanding on the Mobile Environment
- Acquired mobile application development skills with Android.

Contents

UNIT I

Introduction to Mobile Applications: Native and web applications - Mobile OS and Databases. Introduction to Android: History - Features – OSS – OHA - Versions - Android devices - Setting up software – IDE - XML. Introduction to Objective C and iOS – iOS features –user interface - Using Wifi – iPhone marketplace.

UNIT II

Android Architecture: Android Stack - Linux Kernel - Android Runtime - Dalvik VM - Application Framework - Android emulator - Android applications development - Virtualization – APIs – Android File system – A Basic Android Application - Deployment. Android Activities: The Activity Lifecycle – Lifecycle methods – Creating Activity.

UNIT III

Intents – Intent Filters – Activity stack. Android Services: Simple services – Binding and Querying the service – Executing services. Broadcast Receivers: Creating and managing

receivers – Receiver intents. Content Providers: Creating and using content providers – Content resolver.

UNIT IV

Android UI - Android Layouts – Attributes – Layout styles - Linear – Relative – Table – Grid – Frame – Menus - Lists and Notifications - Input Controls: Buttons - Text Fields – Checkboxes - alert dialogs – Spinners - rating bar - progress bar.

UNIT V

Working with databases: SQLite – coding for SQLite using Android - Publishing and Internationalizing mobile applications - mobile application deployment: Game, Clock, Calendar, Converter, Phone book.

REFERENCES

1. Barry Burd, “Android Application Development – All-in-one for Dummies”, 2nd Edition, Wiley India, 2016.
2. Lauren Darcey, Shane Conder, “Sams Teach Yourself Android Application Development in 24 hours”, 2nd edition, Pearson Education, 2013.
3. Jerome (J. F) DiMarzio, “Android – A Programmer’s Guide”, McGraw Hill Education, 8th reprint, 2015.
4. David Mark, Jack Nutting, Jeff LaMarche and Frederic Olsson, “Beginning iOS 6 Development: Exploring the iOS SDK”, Apress, 2013.
5. <http://www.developer.android.com>

Course Title: COMPUTER GRAPHICS AND MULTIMEDIA

Course Number: 17CSEAC23

Number of Credits: 4

Subject Description:

This course presents the origin of computer graphics, vector generating Techniques, transformations, interactive graphics & raster graphics and gives the introduction to Multimedia, Images and Animation.

Goal:

To enable the students to learn basic transformations, algorithms and concepts of Computer Graphics and Multimedia.

Objectives:

On successful completion of the course, the students should have:

- Understood the Computer Graphics and the various graphic algorithms.
- Understood the 2D and 3D transformations, models and generation techniques•
- Understood the Multimedia animation and Desktop Computing.

Contents

UNIT I:

A Survey of Computer Graphics – Overview of Graphics Systems: Video Display Devices – Input Devices – Graphics Software.

UNIT II:

Output Primitives: Points and Lines – Line Drawing Algorithms: DDA – Bresenham`s. Properties of Circles and Ellipses – Pixel Addressing. Two Dimensional Geometric Transformations: Basic Transformations – Matrix Representation – Composite Transformations.

Unit III

Three Dimensional Display Methods – Three Dimensional Geometric and Modeling Transformations: Translation – Rotation – Scaling – Composite Transformations - Color Models and Color Applications.

Unit IV :

Multimedia : Introduction, Definition, Uses of Multimedia, Delivering Multimedia, computer display Vs TV display - TEXT : Fonts and Faces - Using Text in Multimedia - Computers and Text - Font Editing and Design Tools - Hypermedia and Hypertext.

Unit V :

Images : Making Still Images - Image File Formats - 2 D, 3 D - Sound : Digital Audio - MIDI Audio - MIDI vs. Digital Audio - Audio File Formats - Adding Sound to Your Multimedia Project - Animation – Video : Analog, Digital - Digital Video Containers - Obtaining Video Clips - Shooting and Editing Video.

REFERENCES

1. Donald Hearn & M.Pauline Baker, “Computer Graphics”, Second Edition, PHI/Pearson Education.
2. H.M.Neumann and R.F.Sproul, “Principles of Interactive computer Graphics”, Second Edition, McGraw Hill.
3. Steven Harrington, “Computer Graphics – A Programming Approach”, McGraw Hill, 1983.
4. John F. Hughes, Andries van Dam, Morgan McGuire, David F. Sklar, James D. Foley, Steven K. Feiner, Kurt Akeley, „Computer Graphics: Principles and Practice“, Addison-Wesley Professional; 3 edition (July 20, 2013)
5. Multimedia Making It work – 9th Edition, Tay Vaughan, Mc Graw Hill, 2016

Course Title: INTERNET PROGRAMING AND WEB DESIGNING

Course Number: 17CSEAC27

Number of Credits:4

Subject Description:

This course presents the Internet basics, HTML 5, XML, Java script, JSON, jQuery, ASP.NET, SOAP and Web Services concepts.

Goal:

To enable the students to learn the principles of Internet programming.

Objectives:

On successful completion of the course the students should have:

- Gained knowledge in Internet basics, HTML, CSS, XML and Web Services
- Understood Java Script and ASP.NET programming.

Contents

UNIT I

Internet Basics: Introduction–Getting Connection –Services -Mail –News Groups –FTP – HTTP –WWW –HTML5: Introduction –formatting and fonts - tables, images, frames, links and forms –multimedia

UNIT II

Cascading Style Sheets: types of style sheets –positioning elements –backgrounds –margins and padding – manipulating text and images

Java Script programming –form handling and validation–Document Object Model – Browser Management - Event model - ActiveX controls – JSON – jQuery

UNIT III

XML: Need for XML –Documentation –Elements and Attributes –Valid Documents - Document Type Definitions –XML Schema–Rendering XML with XSLT - using JavaScript and XML

UNIT IV

ASP.NET: Introduction to .NET Framework –.NET Languages –ASP.NET Applications - .NET Data Services: ADO.NET –Data Binding –Using XML –ASP.NET AJAX

UNIT V

Web service fundamentals – web service technology stack – SOAP: introduction – SOAP and XML – SOAP Message Exchange Model – creating SOAP web services in .NET

REFERENCES

1. Harvey Deitel, Abbey Deitel, “Internet & World Wide Web –How to Program”, Fifth Edition, Pearson Education, 2012.
2. Kogent Learning Solutions, “HTML 5Black Book”, Dream Tech Publishers, 2011.
3. Scott Mitchell and James Atkinson, “Teach Yourself XML in 21 days”, Sams Publishing, 1999.
4. Matthew MacDonald, “ASP.NET: The Complete Reference”, Tata McGraw Hill, 2002.
5. Alex Ferrara and Matthew MacDonald, “Programming with .Net Web Services”, O’Reilly & Associates Inc., First Edition, 2002.
6. Imaar Spaanjaars, “Beginning ASP.NET 4.5 in C# and VB”, Wrox Publications, John Wiley & Sons, 2013.
7. Thomas Erl (Editor), “SOA with .NET”, Prentice Hall Publications, First Edition, 2010.
8. www.spoken-tutorial.org

Course Title: DATA MINING

Course Number: 17CSEAC28

Number of Credits: 4

Subject Description: This course presents on depth of to data mining techniques; association rule, clustering, classification, web mining, Text Mining ,data mining, Big Data and provide a practical exposure using data mining tool R.

Goal: To enable the students to learn the basic functions, principles and concepts of Data Mining through case studies using R Programming

Objectives: On successful completion of the course the students should have:

- Understand the data mining techniques and its Applications.

Contents

UNIT I

Data mining: Introduction – Data as a Subject – Data Formats - Definitions- KDD vs. Data mining- DM techniques- Association Rules: Concepts- Methods to discover Association rules- A priori algorithm – Partition algorithm- Pincer search algorithm –Dynamic Item set Counting algorithm- FP-tree growth algorithm-Incremental algorithm-Border algorithm-Generalized association rule.

UNIT II

Introduction to R Programming – R Basics Data Structures – Vectors – Lists – Tuples – Data Frames – R Control Structures – IF – WHILE - Packages – Installing – Configuring R in Windows – Visualization using R – Lattice Package – ggplot – Packages - rpart – party – MASS – Linear Regression using R.

UNIT III

Clustering techniques: Clustering paradigms – Partition algorithm-K- Medeoid algorithms – CLARA- CLARANS –Hierarchical DBSCAN- BIRCH -Categorical clustering algorithms-STIRR-ROCK-- Introduction to neural network - learning in NN- Genetic algorithm- Case studies.

UNIT IV

Classification Technique: Introduction – Decision Trees: Tree Construction Principle - Decision Tree construction Algorithm – CART – ID3 – Random Forest - Pruning Text Mining – KDT – Text - Preprocessing - Clustering - Web mining: Basic concepts – Web content mining – Web structure mining – Web usage mining.

UNIT V

Introduction to Big Data –Big Data Road Map - 6 Vs – Big Data Ecosystem– Hadoop – Architecture - MapReduce – HBASE – Hadoop Limitation – SPARK Overview – Architecture - Applications of Big Data. – Data Analytics Classification – Descriptive – Diagnostic – Predictive – Diagnostic – Data Analytics – Case Studies – Data mining in Big Data.

REFERENCES

1. Jaiwei Han and MichelineKamber, "Data Mining Concepts and Techniques", Morgan Kaufmann Publishers, 2011, 3rd Edition.
2. Arun K. Pujari, "Data mining Techniques", Third Edition, Universities Press (India) Limited, Hyderabad, 2013.
3. Pieter Adriaans, DolfZantinge, "Data Mining", Addison Wesley, 2008.
4. Krzysztof J Cios, WitoldPedrycz, "Data Mining: A Knowledge Discovery Approach", Springer, 2010.
5. ArijayChaudhry, Dr. P .S Deshpande, "Multidimensional Data Analysis and Data Mining", Dreamtech press, 2009.
6. <http://www.celta.paris-sorbonne.fr/anasem/papers/miscelanea/InteractiveDataMining.pdf>
7. V.Bhuvaneshwari, T.Devi, Big Data Analytics – A Practitioners Approach, Big Data Analytics , Bharathiar University 2016.
8. V.Bhuvaneshwari, R Programming – A Step by Step , , 2016,
9. Big Data Analytics Beyond Hadoop, VIJAY SRINIVAS AGNESWARAN, Pearson.

Course Title: SOFT SKILLS - II
Course Number: 17CSEAC29

Number of Credits: 2

Subject Description: This course presents an introduction to verbal and non-verbal reasoning, technical programming skills using C++, soft skills, and interview based topics in DBMS & Computer Networks.

Goal: To enable the students to learn the basics of verbal and non-verbal reasoning, technical programming skills using C++, soft skills, and interview based topics in DBMS and Computer Networks.

Objectives:

On successful completion of the course the students should have:

- Understood the basics of verbal and non-verbal reasoning, technical programming skills using C++,
- Acquired knowledge of using soft skills and the interview based topics in DBMS and Computer Networks.

Contents

UNIT I

Verbal Reasoning: General Mental Ability-Coding-Decoding-Blood Relation-Logical Venn Diagram - Mathematical Operations - Arithmetical Reasoning - Truth statement .

UNIT II

Non-Verbal Reasoning-Series-Choosing the Missing Figure in a Series-Detecting the Incorrect Order-Detecting the Wrong figure-Analytical Reasoning-Rule Detection-Construction of Boxes-Figure Formation and Analysis -Formation of a Figure from Parts-Formation of a Figure fragmentation-Identical Figure-Pattern Rearrangement

UNIT III

Technical skill: Concepts of OOPS-Object and Classes - Inheritance – Polymorphism – Data Hiding – Virtual Function - Operator Overloading – Function Overloading

UNIT IV

Interviews, Group Discussions, Presentation Skills, Conversation: Effective Presentation Strategies Planning-Nuances of Delivery- Controlling Nervousness and Stage Fright-Visual Aids in Presentations- Job Interviews-Media Interviews- Communication-Group Discussions-GD as Part of a Selection Process.

UNIT V

Theoretical Concepts – DBMS: Keys-Normalization-RDBMS-Concurrency Control-- Software Engineering: Models-Design Strategies-Testing-Operating System-Process-Memory Management-Paging-Dead Lock-Virtual Memory-Computer Networks-OSI-TCP/IP-Communication Modes-N/W Devices.

REFERENCES

1. Dr. R. S. Aggarwal and S. Chand “A Modern Approach to Verbal & Non-Verbal Reasoning” Revised Edition.
2. Dr. Balagurusamy, “Object Oriented Programming with C++” Tata McGraw-Hill Edition, 2008.
3. Raman Sharma, “Technical Communication-Principles and Practices”, Second Edition.