

Vels Institute of Science, Technology and Advanced Studies

Pallavaram, Chennai 600 117

SCHOOL OF COMPUTING SCIENCES

DEPARTMENT OF COMPUTER APPLICATIONS (MCA)

PROGRAMME SPECIFIC OUTCOMES

The Master of Computer Applications Programme will prepare its graduates to achieve:

- PSO 1 :** Gaining an understanding to apply knowledge of computing and technological advances appropriate to the programme.
- PSO 2:** Inculcating Skills to analyse a problem and to identify and define the logical modelling of solutions.
- PSO 3:** An ability to design, implement and evaluate a computer-based system, process, component, or programme to meet stakeholder needs.
- PSO 4 :** The knack to function effectively in teams to accomplish a common goal.
- PSO 5 :** A sense of professional, ethical, legal, security and social issues and responsibilities.
- PSO 6 :** Effectiveness in communicating with a wide range of audiences.
- PSO 7:** An ability to analyse the local and global impact of business solutions on individuals, organisations, and society.
- PSO 8:** An identification of the need to engage in continuing professional development.
- PSO 9:** Enhancing the skill to work on multidisciplinary tasks
- PSO 10:** Creating awareness towards new and emerging disciplines.
- PSO 11 :** Demonstrating skills to use modern tools, software and equipment for problem solving.
- PSO 12:** Exhibiting the knowledge of professional and ethical responsibilities.
- PSO 13 :** Graduates will be able to communicate effectively in both verbal and written form.
- PSO 14 :** Graduates will demonstrate effects of computing solutions on the society.
- PSO 15 :** Graduates will have a confidence for self-education and ability for continuous

School of Computing Sciences

DEPARTMENT OF COMPUTER APPLICATIONS (MCA)

Board of Studies Members

Sl.No	Name & Address	Designation
1.	Dr.P.Swaminathan , Dean, School of Computing Sciences, Vels University, Chennai.	Chairman
2.	Dr.P.Mayilvahanan , Professor, Department of Computer Applications, School of Computing Sciences, Vels University, Chennai.	Internal Board Member
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5.	Dr.K.Kalaiselvi , HOD, Department of Computer Science, School of Computing Sciences, Vels University, Chennai.	Internal Member
6.	Dr.K.R.Ananthapadmanaban Professor & HOD, Department of Computer Science, SRM Arts and Science College, Chennai.	External Member
7.	Dr.P.Magesh Kumar , Calibsoft Technologies Pvt Ltd., Chennai.	Industry Member
8.	Dr.JothiVenkateswaran , HOD, Department of Computer Science, Presidency College, Chennai.	Special Invitees
9.	Mr.R.Balamurugan , SCOPUS Ltd, Chennai.	Alumni Member

M.C.A.

Curriculum and Syllabus

(Based On Choice Based Credit System)

Effective from the Academic Year

2015–2016

Department of Computer Applications

School of Computing Sciences

MASTER OF COMPUTER APPLICATIONS (MCA)

CURRICULUM

Total No. Of Credits: 130

Category	Code	Course	Hour / Week			Credits
			Lecture	Tutorial	Practical	
Semester I						
Core	15MCA001	Computer Organization & Architecture	4	0	0	3
Core	15MCA002	Programming In C	4	0	0	3
Core	15MCA003	Software Engineering and Methodology	4	0	0	3
Core	15MCA004	Multimedia Systems	4	0	0	3
GE	15————	Generic Elective – I	2	0	0	2
Core	15MCA005	Programming in C Laboratory	0	0	4	2
Core	15MCA006	Flash& Photoshop Laboratory	0	0	4	2
Core	15MCA007	Productivity Software Laboratory	0	0	4	2
Total			18	0	12	20

Category	Code	Course	Hour / Week			Credits
			Lecture	Tutorial	Practical	
Semester II						
Core	15MCA008	Microprocessor Based System Design	4	0	0	3
Core	15MCA009	Object Oriented Concepts and Data Structures	4	0	0	3
Core	15MCA010	Programming In C++	4	0	0	4
Core	15MCA011	Business Mathematics	4	0	0	3
GE	15————	Generic Elective – II	2	0	0	2
Core	15MCA012	Microprocessor Laboratory	0	0	4	2
Core	15MCA013	Programming in C++ Laboratory	0	0	4	2
Core	15MCA014	Visual Basic Laboratory	0	0	4	2
Total			18	0	12	21

Category	Code	Course	Hour / Week			Credits
			Lecture	Tutorial	Practical	
Semester III						
Core	15MCA015	Operating System & Unix	3	0	0	3
Core	15MCA016	Web Technology	3	0	0	3
Core	15MCA017	Programming In Java	3	0	0	3
Core	15MCA018	Financial And Management Accounting	4	0	0	3
DSE	15————	Discipline Specific Elective – I	3	0	0	3
GE	15GPD251	Generic Elective – III	2	0	0	2
Core	15MCA019	Programming in Java Laboratory	0	0	4	2
Core	15MCA020	Operating System& UnixLaboratory	0	0	4	2
Core	15MCA021	Web Technology Laboratory	0	0	4	2
Total			18	0	12	23

Category	Code	Course	Hour / Week			Credits
			Lecture	Tutorial	Practical	
Semester IV						
Core	15MCA022	Computer Networks	3	0	0	3
Core	15MCA023	Relational Database Systems	3	0	0	3
Core	15MCA024	Computer Graphics	3	0	0	3
DSE	15————	Discipline Specific Elective – II	4	0	0	4
DSE	15————	Discipline Specific Elective – III	3	0	0	3
GE	15GPD252	Generic Elective – IV	2	0	0	2
Core	15MCA025	Software Project Development Laboratory	0	0	4	2
Core	15MCA026	Relational Database Systems Laboratory	0	0	4	2
Core	15MCA027	Computer Graphics Laboratory	0	0	4	2
Total			18	0	12	24

V Semester

Category	Code	Course	Hour / Week			Credits
			Lecture	Tutorial	Practical	
Semester V						
Core	15MCA028	Software Testing & Quality Assurance	4	0	0	3
Core	15MCA029	Introduction To PHP& MySQL	4	0	0	4
Core	15MCA030	.Net Technology	4	0	0	3
Core	15MCA031	Data Warehousing And Data Mining	4	0	0	3
DSE	15 ———	Discipline Specific Elective – IV	3	0	0	3
Core	15MCA032	PHP& MySQL Laboratory	0	0	4	2
Core	15MCA033	.Net Technology Laboratory	0	0	4	2
Core	15MCA034	Mini Project Laboratory	0	0	4	2
Total			19	0	12	21

VI Semester

Category	Code	Course	Hour / Week			Credits
			Lecture	Tutorial	Practical	
Core	15MCA035	Main Project	0	0	0	20
Total Credits			–	–	–	130

***Not for Classification**

Total Credits to Complete the Course 130

Total Marks 4600

List of Discipline Specific Elective Courses

S. No.	Code	Course
1	15MCA101	Essential of Information Technology
2	15MCA102	Software Project Management
3	15MCA103	Internet of Things
4	15MCA104	Mobile Computing
5	15MCA105	Compiler Design
6	15MCA106	Cloud Computing
7	15MCA107	Management Information System
8	15MCA108	Organizational Behaviour
9	15MCA109	Object Oriented Analysis and Design
10	15MCA110	Business Intelligence and its Applications
11	15MCA111	Network Security
12	15MCA112	Ad Hoc Networks
13	15MCA113	Big Data Analytics

List of Generic Elective Courses

S. No.	Code	Course
1	15MCA151	Soft Skill – I
2	15MCA152	Soft Skill – II
3	15GPD251	Personality Development – I
4	15GPD252	Personality Development –I I

SYLLABUS

15MCA001 COMPUTER ORGANIZATION & ARCHITECTURE 4 0 03

Course Objective:

A student should grasp the basic concepts of computer architecture and organization, and understand the key skills of constructing cost-effective computer systems. A student should learn how to quantitatively evaluate different designs and organizations, and provide quantitative arguments in evaluating different designs.

Course Outcomes

CO1 : Understand the basic computer organization, design and micro-operations.

CO2 : Understanding of the CPU functioning and computer arithmetic operations.

CO3: Ability to analyse the different methods and techniques of memory organization.

CO4: Ability to understand the concept of cache mapping techniques.

CO5: Ability to understand the concept of I/O organization

CO6: To apply the knowledge of performance metrics to find the performance of systems

CO7: Understand the impact of branch scheduling techniques and their impact on processor performance.

CO8: Be familiar with the representation of data, addressing modes, instructions sets

CO9: Be familiar with assembly language programming

CO10: Be familiar with the basic knowledge of the design of digital logic circuits and apply to computer organization.

UNIT I INTRODUCTION

12

Number Systems – Conversion from One Number to another – Compliments – Binary Codes – Binary Logic – Logic Gates – Truth Tables. Boolean algebra– Axioms – Simplification of Boolean Functions – Karnaugh Map Method– Tabulation Method.

UNIT II LOGIC GATES & CIRCUITS

12

Adders – Sub Tractors – Code Convertor – Multilevel NAND And NOR Circuits – Binary Parallel Adder – Decimal Adder – Decoders – Encoders – Multiplexes – Demultiplexer – Design Of Circuits Using Multiplexers/Decoders.

UNIT III FLIP FLOPS ®ISTERS

12

Flip Flops – RS, JK, D And T Flip Flops – Excitation Table – Registers – Shift Registers – Counters – Ripple Counters – Synchronous Counters – Design Of Counters.

UNIT IV MEMORY UNIT

12

Memory UNIT– Bus Organization – ALU – Design Of ALU– Status Register – Effects of OutputCarry– Microprogramming – Design Of Specific Arithmetic Circuits.

UNIT V ACCUMULATOR

12

Accumulator – Design ofAccumulator – Computer Configuration – Instruction andData Formats – Instruction Sets – Timing And Control – Execution of Instruction – Design of Computer– Hardwired Control–PLA Control andMicro programControl.

TOTAL:60 HOURS

Text Books:

1. M.M. Mano,“Digital Logic Computer Design”, Pearson Education, 5th Edition, 2013.

References:

1. Givone,“Digital Principle Design”, Tata McGraw Hill,New Delhi, 1st Edition, 2003.
- 2.V.Rajaraman,“Fundamentals of Computers”,Third Edition,PHI,New Delhi, 2002
- 3.T.C. Bartee, Computer Architecture and Logical Design, McGraw Hill, 1991

Course Objective:

To gain experience about structured programming, to help students to understand the implementation of C language, to understand various features in C

Course Outcomes

CO1 : Read, understand and trace the execution of programs written in C language.

CO2: Write the C code for a given algorithm.

CO3: Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.

CO4: Write programs that perform operations using derived data types.

UNIT I BASICS OF ‘C’, INPUT / OUTPUT & CONTROL STATEMENTS 12

Introduction – Identifier – Keywords – Variables – Constants – I/O Statements – Operators – Initialization – Expressions – Type Conversion in C – formatted input and output functions – Test Condition for Selection and Iteration – Conditional Execution and Selection – Iteration and Repetitive Execution – goto Statement – Nested Loops – Continue and break statements.

UNIT II ARRAYS, STRINGS AND FUNCTIONS 12

Array – One Dimensional Character Arrays – Multidimensional Arrays – Arrays of Strings – Two Dimensional Character Array – Functions – Parameter Passing Mechanism Scope – Storage Classes – Recursion – Comparing Iteration and Recursion.

UNIT III USER – DEFINED DATATYPES & FILES 12

Structures – Initialization – Nested Structures – Structures and Arrays – Structures and Pointers – Union – typedef and Enumeration Types – Bit fields – File Management in C – Files and Streams – File Handling Functions – Sequential Access File – Random Access File – Command Line Arguments.

UNIT IV POINTERS 12

Pointers – Pointer Operators – Uses of Pointers – Arrays and Pointers – Pointer Arithmetic – Pointers and Strings – Pointer Indirection – Pointers to Functions – Dynamic Memory Allocation and Deallocation.

UNIT V APTITUDE 12

Verbal Ability: English Grammar, Sentence Completion, Verbal Analogies, Word Groups, Instructions, Critical Reasoning and Verbal Deduction.

Numerical Ability: Numerical Computation, Numerical Estimation, Numerical Reasoning and Data Interpretation.

TOTAL: 60 HOURS

Text Books:

1. Behrouz A. Forouzan and Richard F. Gilberg, "Computer science A structured approach using C", CENGAGE learning India pvt., Ltd., New Delhi, Third Edition, 2007.
2. E. Balaguruswamy, "Programming in ANSI C", McGraw Hill Education, Sixth edition, 2007.

References:

1. K.R. Venugopal, S.R. Prasad, "Mastering in C", McGraw Hill Education India, International Edition, 2007.
2. Pradip Dey, Ghosh Manas, "Programming in C", Oxford University Press, Second Edition, 2009.
3. K.N. King, "C programming – A Modern approach", W.W. Norton, Second Edition, 2008.
4. S. Prata, "C Primer plus", Pearson Education, India, 6th Edition, 2013.

15MCA003 SOFTWARE ENGINEERING AND METHODOLOGIES 4 0 0 3

Course Objective:

To provide an insight into the processes of software development, to understand and practice the various fields such as analysis, design, development, testing of Software Engineering. To develop skills to construct software of high quality with high reliability. To apply metrics and testing techniques to evaluate the software

Course Outcomes

CO1 : An ability to design and conduct experiments, as well as to analyze and interpret data.

CO2 : An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

CO3 : An ability to function on multi-disciplinary teams.

CO4: An ability to identify, formulate, and solve engineering problems.

Co5: An understanding of professional and ethical responsibility.

CO6: An ability to communicate effectively.

CO7: The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.

CO8 : A recognition of the need for, and an ability to engage in, life-long learning.

CO9: An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

CO10 : The ability to analyse, design, verify, validate, implement, apply, and maintain software systems.

UNITI INTRODUCTION TO SOFTWARE ENGINEERING

12

Definitions – Size Factors – Quality and Productivity Factors – Managerial Issues – Planning a software project Defining the problem – Developing a Solution Strategy – Planning the Development Process – Planning an Organization structure – Other Planning Activities.

UNITII SOFTWARE COST ESTIMATION

12

Software cost factors – Software Cost Estimation Techniques – Staffing – level Estimation – Estimating Software Maintenance Costs – The Software Requirements Specification – Formal Specification Techniques – Languages and Processors for Requirements Specification.

UNITIII SOFTWARE DESIGN

12

Fundamental Design Concepts – Modules and Modularization Criteria – Design Notations – Design Techniques – Detailed Design Considerations – Real – Time and Distributed System Design – Test Plans – Milestones, walkthroughs, and Inspections.

UNITIV IMPLEMENTATION ISSUES

12

Structured Coding Techniques – Coding Style – Standards and Guidelines – documentation guidelines – Type Checking – Scoping Rules – Concurrency Mechanisms.

UNIT V QUALITY ASSURANCE

12

Walkthroughs and Inspections – Static Analysis – Symbolic Execution – Unit Testing and Debugging – System Testing – Formal Verification Enhancing Maintainability during Development – Managerial Aspects of Software Maintenance – Source Code Metrics – Other Maintenance Tools and Techniques.

TOTAL: 60 HOURS

Text Books:

1. R.Fairley, “Software Engineering Concepts”, Tata McGraw – Hill Edition, 1997.
2. R.S.Pressman, “Software Engineering – A Practioner’s Approach”, McGraw Hill, 6th Edition, 2001.

References:

1. Ian Sommerville, “Software Engineering”, Addison Wesley, 9th Edition, 2001.
2. Rajib Mal, “Fundamental of Software Engineering”, 2nd Edition, PHI, New Delhi, 2005.
3. N. E. Fenton, S. L. Pfleenger, “Software Metrics”, Thomson Asia, Singapore. 2004.

Course Objective:

To understand the definition of multimedia, to understand and differentiate text, image, video & audio, Be able to apply concepts and techniques to multimedia system design, be able to implement key of networked multimedia systems, be able to perform fundamental performance analysis on networked multimedia systems.

Course Outcomes

CO1 : Work with learners to create a project plan based on a client brief and to undertake audience and competitor research

CO2: Work with learners to build a website with images, text, audio and video

CO3 : Recognise and assess the functional skills demonstrated by learners as they complete tasks and activities in the multimedia unit.

CO4: Execute the operation of equipment and/or procedures associated with multiple facets of multimedia. These may include: digital-photography, page layout, typography, video, audio, interactive media, and web design.

CO5: Gain experience with multimedia processes using current, recognized, industry-standard software as well as computer hardware and software associated in both Mac and Windows platforms.

CO6: Demonstrate an advanced knowledge of photo editing including: image manipulation, color correction, compositing, toning, and preparing for distribution.

CO7: Assemble video projects in professional non-linear editing software showing proficiency in importing, exporting, effects, transitions, color correcting, and flow.

CO8: Demonstrate proper knowledge of recording, editing and producing on-air audio content for professional use.

CO9: Students will be aware of the rapid rate of change of technology and methodologies in the multimedia environment.

CO10: Students will be familiar with techniques and resources in order to obtain knowledge and understanding of new developments in multimedia technology.

UNIT I INTRODUCTION 12

Introduction Definition–Multimedia Element–Multimedia Applications–Multimedia System Architecture–Evolving Technologies For Multimedia–Defining Objects For Multimedia System–Multimedia Data Interface Standards–Multimedia Databases.

UNIT II IMAGE COMPRESSION 12

Compression andDecompressionNeedforData Compression–Type of Compression–Binary Image Compression Schemes–Image Compression–Video Compression–Audio Compression.

UNIT III FILE FORMATS 12

Data And File Format StandardsRich Text Format–TIFF File Format–Resource Interface File Format–MIDI File Format–JPEG DIB File Format–AVI File Format–MPEG Standards–TWAIN

UNIT IV MULTIMEDIA I/O TECHNOLOGIES 12

Multimedia I/O TechnologiesImageScanners–Digital Voice andAudio–Digital Camera–Video Images andAnimation–Full Motion Video.

UNIT V MULTIMEDIA APPLICATION DESIGN 12

Multimedia Application DesignMultimediaApplication Classes–Types ofMultimedia System–Virtual Reality–Components ofMultimedia System.

TOTAL: 60 HOURS

Text Book:

1. Prabat K Andleigh And KiranThakrar, "Multimedia System And Design", Prentice Hall India, New Delhi, 2003

References:

1. Ralf Steinmetz, KlaraSteinmetz, "MultimediaComputing&Communications", Pearson Education,2012.
2. TayVaughan, "Multimedia Making It Work", Tata McGraw Hill,2002.
3. Parekh R, "Principles of Multimedia", Tata McGrawHill,2006.

15MCA005 PROGRAMMING IN C LABORATORY 0 04 2

Course Objective

To develop logical skills so that students should be able to solve basic computing problems. To learn the syntax and usage of C programming constructs.

1. Creating and Editing Simple C Program, Compilation and Execution.
2. Decision Making Using Various If Condition and Switch Case
3. Control Structure – Do, While and For
4. Modular Program Development Using Functions
5. Recursion
6. Sorting and Searching Using Arrays
7. Matrix Operations – Add, Subtract, Multiply and Trace.
8. Pointers, Address Operators and Pointer Arithmetic.
9. Structures and Unions, Accessing Their Members
10. Self – Referential Structures and Linked Lists
11. Files and File Operations, Standard Streams.
12. Student Mark List Processing.

TOTAL: 48 HOURS

Course Objective:

Provides students with the ability to use Flash graphics software on microcomputers. Covers basic animation techniques used in the creation, manipulation, and editing of Flash animation graphics.

List of Practicals in Flash

1. To Move An Object, To Move An Object In The Path.
2. Creating A Link Using Texts And Objects, Change The Color Of The Object.
3. Shape Tweening and Using Shape Hints, Motion Tweening, Hybrid Tweening.
4. An Application To Show The Masking Effect

List of Practicals in Photo Shop

1. To Create A Greeting Card, Create Background Picture.
2. Text Effects, Photo Effects
3. Color, Buttons, Editing Images
4. Designing Web Page

List of Practicals in Dreamweaver

- 1 .Text Management
2. Tables–Layers
3. Creating Menu bar
4. Creating Pages and Sites

TOTAL: 48 HOURS

Course Objective:

Microsoft Office is a highly popular desktop suite, containing tools for word processing (Word), spreadsheets (Excel), email (Outlook) and presentations (PowerPoint).

WORD PROCESSING

1. Text Manipulation
Change the Font Size and Type – Aligning and Justification of Text – Underlining the Text
Indexing the Text I, Prepare Bio–Data Ii, Prepare a Letter
2. Usage Of Numbering, Bullets, Footers And Header
 - i Usage of spell checks and find and replace
 - ii. Prepare a document in newspaper format.
 - iii. Prepare a Document with Bullets and Footers and Headers.
3. Tables And Manipulations
 - i. Creations, Insertions, Deletion (Columns & Rows) and Usage of Auto Format.
 - ii. Create A Mark Sheet Using Table And Find Out The Total Marks.
 - iii. Create A Calendar And Auto Format It.
4. Picture Insertion And Alignment, Creation Of Documents Using Templates Creation Of Templates
 - i. Prepare A Greeting Card
 - ii. Prepare A Handout
 - iii. Prepare A Letter Using Any Template
 - iv. Prepare Two Data Using Various Kind Of Templates
5. Mail Merge Concepts
 - i. Prepare A Business Letter For More Than One Company Using Mail Merge
 - ii. Prepare An Invitation To Be Sent To Specific Addresses In The Data Source

ELECTRONIC WORK SHEET

1. Usage Of Formulae And Built In Functions And The Types Of Functions
2. File Manipulations, Data Sorting – Ascending And Descending
3. Mark List Preparation For A Student
4. Individual Pay Bill Preparation
5. Drawing Graphs

PRESENTATION SOFTWARE

1. Exercises On Slide Transition And Animation
2. Usage of Design Templates.

TOTAL: 48 HOURS

Course Objective:

Transform a general problem description in microprocessor-based systems into a design specification, partition a design specification into a set of design tasks, formulate a project schedule and a set of work assignments Work in a team to implement the design tasks, construct a prototype/working demonstration and document the final design

Course Outcome

CO1 : Write programs to run on 8086 microprocessor based systems.

CO2: Understand Macros,functions, Instruction set of 8086 microprocessor.

CO3: Understand the concept of Co-processor of 8086 microprocessor.

CO4: Understand the concept of Interrupts of 8086 microprocessor.

CO5: Understand the assembly language program of embedded systems

UNIT I INTRODUCTION 12

Microprocessor evolution and types – 8086 internal architecture – Introduction to programming – language types –addressing modes – program development steps – program development tools –standard program structure.

UNITII PROGRAMMING STRUCTURES 12

Standard Program Structure – Jumps – While...Do – Repeat. Until – Delay Loops – String –Procedures – Macros – Assembly Directives.

UNIT III INTERRUPTS 12

8086 Microcomputer – Minimum Mode System – Trouble Shooting – 8086 Interrupts – Interrupts Applications – Programmable Timer/Counter – Interrupt Controller.

UNIT IV HANDSHAKING 12

Parallel ports – Handshaking – Interfacingdigital and analog devices – Microcomputer basedprocessor control system – MemoryDMA – Cache Memories.

UNIT V MEMORY ACCESS 12

EDA tools – CoprocessorsMath Coprocessor (8087) –Microcontrollersintroduction – architectureaddressing modes.

TOTAL: 60 HOURS

Text Book:

1. Douglas V Hall, “Microprocessors And Interfacing”, TMH, 2nd Edition Revised, 2007

References:

1. K.UdayaKumar and B.S Umasankar, “Advanced Microprocessor and IBM–PC Assembly Language Programming” THM, 2008.
2. A.P.Mathur, “Introduction to Microprocessor”, Tata McGraw Hill, 3rd Ed., 2009.

15MCA009 OBJECT ORIENTED CONCEPTS AND DATA STRUCTURES 4 0 0 3**Course Objective:**

A student can define the terms of software engineering (software life cycle, software improvement. A student can understand simple UML (Unified Modeling Language) diagrams to represent OO designs and convert a design in UML to the equivalent code. To introduce Object Oriented language constructs.

Course outcome

CO1 : Better understanding of the fundamentals of object oriented programming concepts.

CO2: Understand the behaviour of basic data structures.

CO3: Understand how the use of data structure & algorithm affects the performance of program.

CO4 : Analyse a problem and determine the appropriate data structure for the problem.

CO5: Understand and analyse elementary algorithms: sorting & searching.

CO6: Implement abstract data types in multiple ways recognizing the various strengths and weaknesses of those implementations.

CO7: To solve problems based upon different data structure & also write programs.

CO8: To analyse characteristics of OOP and to implement OOP in various applications

CO9: Ability to choose an appropriate data structure for a particular problem.

CO10 : Ability to breakdown simple programming goals into object-oriented components and solve the problem by writing programs.

UNIT II INTRODUCTION TO THE OOPS

12

Introduction to the OOPs – Application of OOPs – Benefits of OOPS – OOPS concepts – Classes and Objects–Polymorphism – Encapsulation – Data Abstraction – Inheritance.

UNIT III INTRODUCTION TO DATA STRUCTURES

12

Introduction to Data Structures – Classification of DS – Abstract Data Types – Asymptotic Notations– Time Complexity – Arrays – Representation Of Arrays – Operations On Arrays –Stacks – Application Of Stack – Evaluation of Expressions – Queues – Application Of Queue – Circular Queue.

UNIT III LINKED LISTS

12

Linked Lists Ordered Lists –Singly Linked List – Circular Linked Lists – Doubly Linked Lists – Polynomials – General Lists.

UNIT IV TREES

12

Trees –Binary Trees – Binary Tree Traversals, Binary Tree Representation –Binary Search Trees– Threaded Binary Trees – Application of Trees (sets)

UNIT V GRAPHS

12

Representation of Graphs – Graph Implementation – Graph Traversals – Application of Graph Traversals – Minimum Cost Spanning Trees – Shortest Path Problems.

TOTAL: 60 HOURS

Text Books:

1. E.Balagurusamy, “Object Oriented Programming with C++”, Tata McGraw Hill, Publishing Limited, New Delhi, 2014.
2. Adam Drozdek, “Data Structures and Algorithms in C++”, Vikas Publishing House, New Delhi, 2001.

References:

1. Robert Lafore, “Object Oriented Programming in C++”, Galgotia, 2014.
2. Herbert Schitt, “C++ – The Complete Reference”, Tata McGraw Hill, Publishing Ltd, 3rd Edition, 2010.
3. Ellis Horowitz and Sartaj Sahir, “Fundamentals of Data Structure”, Galgotia Publications. 2014.

Course Objective:

Introduction to compiling and software development, basic scalar data types, operators, flow control, streamed input/output, conversions, declaring, defining and invoking functions, strings processing, exceptions handling, dealing with namespaces, object-oriented approach and its vocabulary, dealing with classes and objects and defining overloaded operators

Course Outcomes

CO1: Understand the features of C++ supporting object oriented programming

CO2: Understand the relative merits of C++ as an object oriented programming language

CO3: Understand how to produce object-oriented software using C++

CO4: Understand how to apply the major object-oriented concepts to implement object oriented programs in C++, encapsulation, inheritance and polymorphism

CO5: Understand advanced features of C++ specifically stream I/O, templates and operator Over loading

UNIT I INTRODUCTION TO C++**12**

Introduction to C++ Language – Token's, Keywords, Data Types, Variables, Manipulators –Expression– Decision Making and Control Structures.

UNIT II FUNCTIONS**12**

Functions – Function Prototyping – Call By Value – Call By Reference – Friend And Inline Functions – Classes And Objects – Static Member Variable – Static Member Functions – Default Arguments – Constructors And Destructors – Object As Argument – Object As Return Type.

UNIT III POLYMORPHISM**12**

Polymorphism, Categorization of polymorphism techniques, Method polymorphism, Polymorphism by Parameter, Operator overloading, parametric polymorphism,

UNIT IV POINTERS & I/O**12**

Inheritance – Single, Multiple, Hierarchical, Hybrid – Pointers – Console I/O Operations– Creating Own Manipulators –Templates – Exception Handling.

Files – Classes for File Stream Operations – Opening, Closing and Processing Files – End of File Detection – File Pointers – Updating a File – Error Handling During File Operations – Command Line Arguments.

TOTAL: 60 HOURS

Text Books:

1. E.Balagurusamy, “Object Oriented Programming with C++”, Tata McGraw Hill, Publishing Limited, New Delhi, 2013.

References:

1. Robert Lafore, “Object Oriented Programming in C++”, Galgotia, Forth Edition, 2004.
2. Herbert Schildt, “C++ – The Complete Reference”, 3rd Edition, TMH, Publishing Ltd, 2010.

15MCA011**BUSINESS MATHEMATICS****4 003****Course Objective:**

To impart the knowledge of Mathematics and Numerical Methods to the students. The course will also serve as a prerequisite for specialized studies and research

Course Outcomes

- CO1: Solve business arithmetic operations with fractions to do business problems, and be able to select which math method needs to be used to do problems.
- CO2: Use percentages, ratios, and proportions for business applications such as discounts, mark-ups, and markdowns, and be able to differentiate which math methods should be used for different problems.
- CO3 : Use simple and compound interest to do business calculations such as value of money, maturity value, promissory notes, present value, and future value and be able to differentiate which math method should be used for different problems.
- CO4: Use business statistics for central measurements, frequency distributions, graphs, and measure of dispersion and be able to select which math method should be used for different problems.

UNIT I MATRICES**12**

Introduction – Definition – Determinant – Types Of Matrices – Matrix Operations – Rank Of A Matrix – Inverse Of A Matrix–Solution Of Linear Equations.

UNIT II FINITE DIFFERENCES**12**

Introduction–Difference Operators–Newton’s Interpolation Formula–Lagrange’s Interpolation Formula–Inverse Interpolation.

UNIT III NUMERICAL DIFFERENTIATION AND INTEGRATION**12**

Derivatives Using Newton’s Forward Difference Formula – Derivatives Using Newton’s Backward Difference Formula – Derivatives Using Central Difference Formula.
NUMERICAL INTEGRATION: Trapezoidal rule–Simpson’s rule.

UNIT IV SET THEORY**12**

Set Theory – Definition– Elements and Types of Sets– Operations on Sets– Relations and Functions of Sets.

UNIT V DIFFERENTIAL CALCULUS**12**

Differentiation – Meaning – Rules Maxima and Minima –Applications of Differentiation Demand function–Supply function–Cost function–Revenue function–Profit function–Elasticity–Elasticity of demand–Elasticity of supply.

TOTAL: 60 HOURS**References:**

1. P.R.Vittal, “Business Mathematics”, Margham Publications, 2nd Edition, 2003.
2. S. Arumugam, A. Thangapandi Isaac and A. Somsundaram, “Numerical Methods, Scitech Publications India Pvt. Ltd, 2001.
3. A. Singaravelu, Allied Mathematics, Meenakshi Agency, 2007.

15MCA012 MICROPROCESSOR LABORATORY**0 0 4 2****Course Objective:**

This laboratory course will mainly comprise of exercise on what is learnt under the paper Microprocessor Based System Design (15MCA008)

Using 8085 and Using 8086 Microprocessor kit / MASM software

1. Multibyte Addition of 16 bit number
2. Multibyte Subtraction of 16 bit number
3. Multiplication of 16 bit number
4. Division of 16 bit number
5. Computing GCD of n Numbers
6. Computing LCM of n Numbers
7. Linear Search
8. Computing Factorial
9. Computing Fibonacci Number
10. Greatest of two numbers
11. Computing factorial using procedures
12. Computing factorial using macros

TOTAL: 48 HOURS**15MCA013 PROGRAMMING IN C++ LABORATORY****0 0 4 2****Course Objective:**

Understand and use the basic programming constructs of C++, Isolate and fix common errors in C++ programs, use memory appropriately, including proper allocation/deallocation procedures, apply object-oriented approaches to software problems in C++ and write small-scale C++ programs using the above skills.

1. Implementation of arrays (One Dimensional sorting)
2. Implementation of arrays (One Dimensional multidimensional)
3. Implementation of arrays (Multidimensional)
4. Implementation of Stack (Using Arrays)
5. Implementation of Queue (Using Pointers)
6. Evaluation of Expressions – ITP (infix to postfix)

7. Postfix expression evaluation
8. Polynomial addition using pointers
9. Singly Linked List
10. Doubly Linked List
11. Tree Traversal (Preorder, Inorder and Postorder): Search methods in graph (DFS, BFS) Using recursion.
12. Shortest path method

TOTAL: 48 HOURS

15MCA014 VISUAL PROGRAMMING LABORATORY 0 0 4 2

Course Objective:

This course introduces computer programming using the Visual BASIC programming language with object-oriented programming principles. Emphasis is on event-driven programming methods, including creating and manipulating objects. Upon completion, students should be able to design, code, test and debug at a beginning level.

1. Building Simple Applications
2. Working with Intrinsic Controls and ActiveX Controls
3. Application with multiple forms
4. Application with Dialogs
5. Application with Menus
6. Student Mark List Processing using Data Controls
7. Application using Common Dialogs
8. Drag and Drop Events
9. Employee Pay roll Database using RDO
10. Database Management ADO
11. Application using windows common controls(Treeview and Listview)
12. Creating ActiveX Controls

TOTAL: 48 HOURS

Course Objective: Recognize the concepts and principles of operating systems, the main objective of this course is to provide students with the basic, knowledge and skills of operating,, Managing, and maintaining microcomputer systems, dealing with windows environment efficiently.

Course Outcomes

CO1: Master functions, structures and history of operating systems

CO2: Master understanding of design issues associated with operating systems

CO3: Master various process management concepts including scheduling, synchronization,
Deadlocks

CO4: To be familiar with multithreading

CO5: Master concepts of memory management including virtual memory

CO6: Master system resources sharing among the users

CO7: Master issues related to file system interface and implementation, disk management

CO8: To be familiar with protection and security mechanisms

CO9: To be familiar with various types of operating systems including Unix.

UNIT I INTRODUCTION

9

Introduction – Multi programming – Time sharing – Distributed system – Real time system General System architecture – Operating system services – System calls – System program – System Design and Implementation, Process Management Process concept – Concurrent process – Scheduling concepts – CPU scheduling – Scheduling Algorithms. Multiple processor scheduling.

UNIT II PROCESS MANAGEMENT

9

Process Management Process Synchronization – Critical section – Synchronization hardware – Semaphores, classical problem of synchronization, inter process communication, deadlocks characterization, Prevention, Avoidance and Detection.

UNIT III STORAGE MANAGEMENT

9

Storage Management – Swapping – single and multiple partition allocation – paging – segmentation – paged segmentation, virtual memory – demand paging – page replacement and algorithms, thrashing. Files and Protection – File system organization – file operations– access methods

UNIT IV INTRODUCTION TO UNIX

9

Introduction to Unix–Unix components – UNIX file – file attributes and permission – standard I/O – redirection – pipe and filters – grep and stream editor – process and signal commands.

UNIT V SHELL PROGRAMMING

9

Shell programming – Shell variables – Control Structures – Arithmetic in Shell programming – Debugging Scripts.

TOTAL: 60 HOURS

Text Books:

1. A.Silberschatz, P.B.GalvinGanaga, “Operating Concepts”, Addison Wesley – publishing Co.,6th Edition, 2002.
2. Das, Sumitabha, “UNIXTHE ULTIMATE GUIDE”, Tata McGraw Hill, Delhi,2001.

References:

1. Deitel H.M. “An Introduction to Operating System”. Addison Wesley Publishing Co.,
2. Tanenbaum.A, “Operating System – Design and implementation”, Prentice– Hall of India.
3. B.A. Fozougar, R.Failberg, “Unix and shell programming”, Thomson, 2003.

CAC016

WEB TECHNOLOGY

3 0 0 3

Course Objective:

Giving the students the insights of the Internet programming and how to design and implement complete applications over the web, DesignMethodologies with concentration on Object–Oriented concepts, Client–Side Programming, Server–Side Programming, Database Connectivity to web applications, Adding Dynamic content to web applications,Programming Common Gateway Interfaces, Programming the User Interface for the web applications.

Course Outcomes

CO1: Understand the HTML programming.

CO2: Create and process HTML tags

CO3: Create and execute advanced dynamic web pages with scripts.

CO4: Create client side scripting language JavaScript

CO5: Understand the basics of XML,JSP programming

CO6:Understand the logic behind advanced web applications.

UNIT I INTRODUCTION TO HTML

9

Introduction to common HTML, Links and Addressing–Linking in HTML–Images and Anchor–HTML and Images–HTML Images Basics–ALT Attributes–Image alignment–HSPACE and VSPACE–HEIGHT and WIDTH–Layout with Tables–Introduction Tables–Simple Tables–ROWSPAN and COLSPAN–Tables for Layout–Frames–Simple Frame Example–Forms–Forms Controls–Text Controls–Additional<input>Type–New and Emerging form Elements.

UNIT II JAVA SCRIPT

9

Core Java Script–Variables–Constant–Expression Conditions–Relational Operators–Data Types–FlowControl–Functions–Objects–Data type Conversation&Equality–Windows and Frames–Forms and Data

UNIT III XML & SERVLET

9

Servlets Features – 3-Tier applications – Servlet API – Explaining servlet life cycle - Creating sample servlet – working with ServletConfig , Servlet Context, HtpServletRequest and HtpServletResponse – Request Delegation and Request scope

UNIT IV JSP

9

Basic JSP Architecture–Life Cycle of JSP (Translation, compilation)–JSP Tags and Expressions–Role of JSP– Scripting elements –Implementation of JSP

UNIT V JDBC & RMI

9

JDBC–Introduction to JDBC and its components–implementing JDBC in Applet in –introduction to RMI–Structure of RMI–implementing RMI.

TOTAL:45 HOURS

Text Books:

1. I.Bayross, “Teach yourself webtechnology part 1 & 2“,BPB, 2010.
2. J.Niederst, “Web design in a Nutshell”,SPD, 2011.

References:

1. A.Subramanyam, “Java Server Programming”, SPD, J2EE edition, 2001.
2. M.Young, ”Step by Step XML”, PHI. Second Edition, 2002.

Course Objective:

To understand the object oriented programming using Java, invoking methods using class libraries, the important topics and principles of software development & be able to use the Java SDK environment to create, debug and run simple Java programs

Course Outcomes

CO1: Improving knowledge of the structure and model of the Java programming language, Knowledge

CO2: Use the Java programming language for various programming technologies - Understanding

CO3: Develop software in the Java programming language – Application

CO4: Evaluate user requirements for software functionality required to decide whether the Java Programming language can meet user Requirements - Analysis

CO5: Propose the use of certain technologies by implementing them in the Java Programming Language to solve the given problem - Synthesis

CO6: Developing Network based programming using Java.

CO7: Use Applet, Awt based programming for creating web sites.

UNIT I INTRODUCTION TO JAVA**9**

Introduction to Java – Features of Java – Object Oriented Concepts – Lexical issues – Data Types – Variables – Arrays – Operators – Control Statements.

UNITII CLASSES, OBJECTS AND METHODS**9**

Classes – Objects – Constructors – Overloading methods – Access control – Static and fixed Methods – Inner Class – String Class – Inheritance – Overriding Methods – Using Super – Abstract Class.

UNITIII PACKAGES**9**

Packages – Access Protection – Importing Packages – Interfaces – Exception Handling – Throw and Throws – Thread – Synchronization – Messaging – Runnable Interface– Inter Thread Communication

UNITIV I/O STREAMS**9**

I/O Streams – File Streams – Applets – String Objects – String Buffer – Char Array – Java Utilities – Random, Vector, Calendar and Properties.

Network Basics – Socket Programming – Proxy Server – TCP/ IP Sockets Net Address – URL – Datagrams – Working With Windows Using AWT Classes. AWT Controls – Layout Management and Menus.

TOTAL:45 HOURS

Text Book:

1. P. Naughton& H. Schildt, “Java2-The Complete Reference”, 5th Edition, Tata McGraw Hill, 2002.

References:

1. Cay S. Horstmann, Gray Cornell, “Core Java 2 Volume 1 Fundamentals”, Addison Wesley, 2003.
2. K. Arnold and J. Gosling, “The Java ProgrammingLanguage”, Second Edition,

15MCA018 FINANCIAL AND MANAGEMENT ACCOUNTING**4 0 03****Course Objective:**

Describe the system of accounting standards and principles, prepare a balance sheet, income statement, and a statement of cash flows using both the indirect and direct method. account for short term investments and receivables, including bad debts, account for the purchase, depreciation, or a premium by the effective interest method, including interest payments for full and partial periods.

Course Outcomes

CO1: Define bookkeeping and accounting

CO2: Explain the general purposes and functions of accounting

CO3: Explain the differences between management and financial accounting

CO4: Describe the main elements of financial accounting information – assets, liabilities, revenue and expenses

CO5: Identify the main financial statements and their purposes.

UNIT I PRINCIPLES OF ACCOUNTING

12

Principles of Accounting Principles of double entry – Assets and Liabilities – Accounting records and systems – Trial balance and preparation of financial statements – Trading, Manufacturing, and profit and Loss accounts, Balance Sheet including adjustments (Simple problems only).

UNIT II ANALYSIS, INTERPRETING ACCOUNTS AND FINANCIAL STATEMENTS

12

Analysis And Interpreting Accounts And Financial Statements Ratio Analysis –Use Of Ratios In Interpreting The Final Accounts (Trading Accounts And Loss A/C And Balance Sheet) – Final Accounts To Ratios As Well As Ratios To Final Accounts.

UNIT III BREAK-EVEN ANALYSIS

12

Break-Even Analysis And Marginal Costing Meaning Of Variable Cost And Fixed Cost – Cost Volume Profit Analysis – Calculation Of Breakeven Point, Profit Planning, Sales Planning And Other Decision – Making Analysis Involving Break – Even Analysis –Computer Accounting And Algorithm.(Differential Cost Analysis To Be Omitted)

UNIT IV BUDGET FORECASTING

12

Budget/Forecasting Preparation of and Characteristics of Functional Budgets, Production, Sales, Purchases, Cash and Flexible Budgets.

UNIT V PROJECT APPRAISAL

12

Project Appraisal Method Of Capital Investment Decision Making Payback Method, ARR Method – Discounted Cash Flows Net Present Values Internal Rate Of Return Sensitivity Analysis Cost Of Capital.

TOTAL:60 HOURS

Text Books:

1. Shukla M.C. & T.S. Grewal, “Advanced Accounts”, S.Chand & Co. New Delhi, 1991.
2. Gupta R.L. & M. Radhaswamy, “Advanced Accounts Vol. II”, Sultan Chand & Sons, New Delhi, 1991.

References:

1. Man Mohan & S.N. Goyal, “Principles of Management Accounting”, Arya Sahitya Bhawan, 1987.
2. Kuchhal, S.C, “Financial Management”, Chaitanya, Allahabad. 1980.
3. Hingorani, N.L. & Ramanathan, A.R, “Management Accounting”, Sultan Chand, New Delhi, 5th edition, 1992..

Course Objective:

Be able to use the Java SDK environment to create, debug and run simple Java programs, Write programs using object-based programming techniques including classes, objects and Inheritance, Program Java keyboard input and screen output Write clear, elementary Java programs (applications and applets), use a Java-enabled browser and/or the appletviewer to execute Java applets, Use the Java interpreter to run Java applications

Application

1. Determining the order of numbers generated randomly using Random Class.
2. Implementation of Point Class for Image manipulation
3. Usage of Calendar Class and manipulation
4. String Manipulation using Char Array
5. Database Creation for string e-mail address and manipulation
6. Usage of Vector Classes
7. Implementing Thread based applications and Exception Handling in Synchronization
8. Implementing Thread based applications and Exception Handling in asynchronization.

Applets

9. Working with frames and various controls.
10. Working with Dialogs
11. Working with Menus
12. Working with Panel and Layout

TOTAL: 48 HOURS**Course Objective:**

Describe the general structure and purpose of an operating system, explain the concepts of process, address space, and file, compare and contrast various CPU scheduling algorithms; (OS). The objective of the course is to help the programmers create a productive UNIX environment

1. Write a script that ask for users age. If its equal to or higher than 18 , print a message saying this user is allowed to drive any vehicle. If the user age is below 16 print a message telling the user how many years he/she as to wait before legally being allowed to drive.
2. Use an if/tehn /else construct that prints information about the current month.The script should print the number of days in this month and give information about leap year if the current month is February.

3. Check whether the given number is Armstrong.
4. Write a shell script for factorial.
5. Generate a shell script of Fibonacci series and its summation.
6. Check whether the given number is prime or not.
7. Accept any number of arguments and prints them in the reverse order.
8. Design a menu driven program for rename , remove and copy commands.
9. Process scheduling FCFS
10. Process Scheduling Least Frequency used.
11. Process Scheduling Round Robin
12. Signalling processes

TOTAL: 48 HOURS

15MCA021

WEB TECHNOLOGY LABORATORY

0 04 2

Course Objective:

Understand, analyze and apply the role of languages like HTML, DHTML, CSS, XML, Javascript, Servlet and JSP in the workings of the web and web applications. Understand, analyze and create web pages using HTML, DHTML and Cascading Styles sheets. Understand, analyze and build and consume web services.

1. Prepare a bio data using various HTML formatting Tags
2. Prepare Student Mark sheet using Table tags including colspan and rowspan.
3. Develop a webpage for Shopping mall using frames and links using HTML.
4. Write a program in JavaScript for a simple calculator
5. To create an array of elements using java scripts.
6. To find the greatest of two numbers using javascript.
7. Read a string and list it character by character using javascript.
8. Linking the image without clicking using mouseover event in javascript.
9. Write a program to change the background of the webpage using javascript.
10. Create a program for client and server side program
11. Create a webpage for server side program to find the number of hits.
12. Write a program for html to JSP to generate username and password

TOTAL: 48 HOURS

Course Objective:

The students will be able to build an understanding of the fundamental concepts of computer networking. Familiarize the student with the basic taxonomy and terminology of the computer networking area. Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking.

Course Outcome

CO1: Understand the fundamental underlying principles of computer networking

CO2: Understand details and functionality of layered network architecture

CO3: Have a good understanding of the OSI Reference Model and in particular have a good knowledge of Layers 1-3.

CO4: Knowledge about the organization of computer networks, factors influencing computer network development and the reasons for having variety of different types of networks

CO5: Understand the main protocols such as HTTP, FTP, SMTP, TCP, UDP, IP

CO6: Ability to analyze simple protocols and can independently study literature concerning computer networks.

CO7: Have a basic knowledge of the use of cryptography and network security

CO8: Have an understanding of the issues surrounding Mobile and Wireless Networks.

CO9: Understand the ethical, legal, security, and social issues related to computer networking

CO10: To master the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks

UNIT I INTRODUCTION**9**

Introduction– Computer Networks – Network For Companies – Network For People – Application – Network Hardware–LAN, WAN, MAN, Wireless Networks–Network Software – Protocol Hierarchies – Reference Model–OSI Reference model, TCP/IP Reference – Comparison of OSI & TCP/IP.

UNIT II TYPES OF LAYERS**9**

The Internet – The ARPANET–NSFNET–Internet Usage– Architecture Of Internet– Connection Oriented Network X.25, Frame relay–ATM–ATM Virtual Circuits–ATM Reference Model –Guided Transmission Media – Magnetic Media – Twisted Pair – Coaxial Cable – Fibre Optics – Wireless Transmission – Data Link Layer – Data Link Layer Design Issues.

UNIT III TYPES OF PROTOCOLS

9

Public Switched Telephone Network–Structure Of Telephone System–Switching–Elementary Data Link Protocols–An Unrestricted Simplex Protocol–A Simplex Stop And Wait Protocol–A Simplex Protocol For A Noisy Channel–Sliding Window Protocols–One Bit Sliding Window Protocol–A Protocol Using Go Back N–A Protocol Using Selective Repeat.

UNITIV ROUTING ALGORITHMS

9

The Network Layer – Design Issues – Routing Algorithm – The Optimality Principle – Shortest Path Routing – Flooding – Distance Vector Routing – Hierarchical Routing – Link State Routing – Broad Cast Routing – Multicast Routing – Congestion Control Algorithm – General Principle Of Congestion Control – Congestion Prevention Policies – Congestion Control In Virtual Circuit Subnets – Congestion Control In Datagram Subnets – Load Scheduling – Jitter Control.

UNITV TRANSPORT LAYER

9

Transport Layer – Design Issues – Elements Of Transport Protocols – Addressing – Connection Establishment – Connection Release – The Internet Transport Protocol – Network Security – Cryptography.

TOTAL:45 HOURS

Text Book:

1. S.Tanenbaum, “Computer Networks”, Pearson Education, Inc, New Delhi, Fourth Edition, 2003.

References:

1. B. Forouzan, “Introduction to Data Communications in Networking”, Tata McGraw Hill, New Delhi, 2007.
2. F. Halsall, “Data Communications, Computer Networks and Open Systems”, Addison Wesley, 2005.
3. Bertsekas and R. Gallager, “Data Networks”, Prentice hall of India, New Delhi, 2012.

Course Objective:

To introduce basic concepts of RDBMS, to introduce basic concepts of SQL, to introduce the concept of transaction processing, to implement the database normalisation using normal forms.

Course Outcomes

- CO1: Explain the characteristics, architecture of database approach, describe the components, major functions of a database system and give examples of their use.
- CO2: Compare and contrast appropriate data models, including concepts in modeling notation and how they would be used.
- CO3: Demonstrate use of the relational algebra operations from mathematical set theory (union, intersection, difference, and Cartesian product) and the relational algebra operations developed specifically for relational databases (select (restrict), project, join, and division).
- CO4: Create a relational database schema in SQL, use SQL to create a non-procedural query, write a stored Procedure that deals with parameters and has some control flow, to provide a given functionality.
- CO5: Determine the functional dependency between two or more attributes, compute the closure of a set of attributes, evaluate a proposed decomposition, and describe the properties of 1NF, 2NF, 3NF, BCNF and 4NF.
- CO6: Familiarize the Storage and File Structures and the different Physical Storage media used.
- CO7: Give examples of the application of primary, secondary, and clustering indexes, explain the theory and application of internal and external hashing techniques.
- CO8: Discuss the PL- SQL programming structures, control structures, functions, procedures with the example programs.

UNIT I INTRODUCTION TO DATABASE SYSTEMS**12**

Overview – Data Models – Database System Architecture – History of Database Systems. Entry–Relationship Model Basic Concepts – Constraints – keys – Design Issues – Entry Relationship Diagram – Weak Entity Sets – Extended E–R Features – Design of an E–R Database Schema – Reduction of E–R Schema to Tables –UML.

UNIT II RELATIONAL MODEL**12**

Relational Algebra – Extended Relational Algebra Operations – Modification of Database – views – Tuple Relational Calculus – Domain Relational Calculus. SQL Background – Basic Structure – Set

Operations – Aggregate Functions – Null Values – Nested Sub queries – views – Joined Relations – Data– Definition Language – Embedded SQL – QBE.

UNIT III NORMAL FORMS

12

Integrity and Security Domain Constraints – referential Integrity – Assertions – Triggers – Security and Authorization – Authorization in SQL – Encryption and Authentication. Relational – Database Design Pitfalls in relational – Database Design – Function Dependencies– Decomposition – Desirable Properties of Decomposition – Normal Forms – Boyce – Codd Normal Forms.

UNIT IV FILE ORGANIZATION

12

Storage and File Structures Overview of Physical Storage media – magnetic Disks – RAID – Tertiary Storage – Storage Access – File Organization – Organization of Records in Files – Data – Dictionary Storage – Indexing and hashing.

UNIT V Oracle,SQL&PL/SQL

12

Introduction to Oracle – DDL,DML and DCL – Aggregate functions – sub queries – join Operations – Views – PL/SQL Block – decision making and Control Structures – Procedure – functions – Sequences – Cursors and Triggers – Example Database Programs.

TOTAL: 60 HOURS

Text Books:

1. A.Silberchatz, H.Korth, Subarshan, “Database System Concepts”, McGraw – Hill Higher Education, 5th Edition, 2012.
2. Koch and Liney, “Oracle9iThe Complete reference”, McGraw–Hill, 2002

References:

1. C.J.Date, “An Introduction to Database Systems”, Pearson Education, Seventh Edition, 2003.
2. Elmasri, Navathe, “Fundamentals of Database Systems, Addison Wesley”, 3rd Edition,2000.
3. Jeffrey D. Ullman, Jenifer Wisdom, “A First Course in Database Systems”, Pearson Education Asia, 2001.
4. Bipin C. Desai, “An Introduction to Database Systems”, Galgotia Publications Pvt. Limited, 2001.
5. Oracle Database Handbook (Oracle Press) 2007.

Course Objective:

Students will learn how to develop interactive programs that use effectively the graphics functionalities available in contemporary personal computers, the fundamental principles and technologies upon which these functionalities, and possibly their future evolutions, are based, and the skills for designing and implementing practical graphic solutions to challenging problems in different application domains.

Course Outcomes

CO1: To understand the foundations of computer graphics.

CO2: To understand the concept of geometric, mathematical and algorithmic concepts necessary for programming computer graphics e.g., the graphics pipeline, DDA and Bresenham algorithm for speedy line and circle generation.

CO3: To understand the comprehension of windows, clipping and view-ports object representation in relation to images displayed on screen.

CO4: To understand the software utilized in constructing computer graphics applications. (e.g 2D & 3D studio, Maya)

CO5: Explain applications, principles, commonly used and techniques of computer graphics.

UNIT I INTRODUCTION**9**

Overview of Graphics – Bresenham's Technique – Line Drawing and Circle Drawing Algorithm – DDA – Line Clipping – Text Clipping

UNIT II 2D TRANSFORMATION**9**

Two Dimensional Transformation – Scaling and Rotations – Interactive Input Methods – Polygons – Splines – Bezier Curves – Window View Port Mapping Transformation

UNIT III 3D TRANSFORMATION**9**

3D Concepts – Projections – Parallel Projection – Perspective Projection – Visible Surface Detection Methods – Visualization And Polygon Rendering – Color Models – Animation – Key Frame Systems – General Animation Functions – Morphing

UNIT IV OVERVIEW OF MULTIMEDIA**9**

Multimedia Hardware and Software – Components of Multimedia – Text, Image – Graphics – Audio – Video – Animation – Authoring.

UNIT VMULTIMEDIA SYSTEMS AND APPLICATION

9

Multimedia Communication System – Data Base System – Synchronization Issues – Presentation Requirements – Applications – Video Conferencing – Virtual Conferencing – Virtual Reality – Interactive Video – Video on Demand.

TOTAL: 45 HOURS

Text Books:

1. Hearn D and Baker M.P, "ComputerGrapics–C Version", Pearson Education (UNIT1, 2&3), Second Edition, 2010.
2. Ralf Steinmetz, KlaraSteinnmetz, "Multimedia Computing, Communication and Aplication", Pearson Eucation, (UNIT4&UNIT5), 2004.

References:

1. SiamonJ.Guiibbs and Dionysios C.Tsichritzis, "Multimedia Programming", Addison Wesley, 2005.
2. John Villamil, Casanova and LeonyFernanadez, Eliar, "Multimedia Graphics", PHI, 2008.

15MCA025

SOFTWARE DEVELOPMENT LABORATORY

0042

Course Objective:

To learn will center on how to understand, organize, analyze, and modify software for menu-driven concept, to have hands-on experience in these areas and gain the ability to extend these skills so as to provide a strong basis for independent computer science work.

Develop software using CASE tools for the application like

1. Library Information Processing.
2. Students Mark sheet processing
3. Telephone directory maintenance.
4. Gas booking and delivery system.
5. Electricity Bill Processing.
6. Bank Transaction (SB).
7. Pay roll processing.
8. Inventory
9. Question Database and conducting quiz.
10. Purchase order processing.
11. Seat Reservation System.
12. Personal Information System

Software required

Languages:C/C++/java/JSDK/Web browser. Any front end tool(like VB,Developer2000)etc. Any backend tool(Oracle).Any CASE tool

TOTAL: 48 HOURS

15MCA026 RELATIONAL DATABASE SYSTEMS LABORATORY 0042

Course Objective:

Understand the fundamental concepts of database management. These concepts include aspects of database design, database languages, and database-system implementation, understand the role of the DBMS & RDBMS in the organization.

SQL PLUS:

1. Create, Insert, Select & Update into database & simple queries.
 - a. Logical Operators
 - b. Set Operators
 - c. Sorting and Grouping.
2. Nested queries
 - a. Sub-queries
 - b. Join operations.
 - c. The Use of Indexes, Creating Views and Querying In Views.
3. Built-in-functions of SQL, Aggregate Functions & String Functions

PL / SQL:

4. Program for Student Evaluation Systems.
5. Program for Payroll System
6. Program for Electricity Bill Preparation.
7. Program for Seat Reservation Problems
8. Program for create and access sequence and synonyms.
9. Program for create and access the functions
10. Program for create and access Stored procedures
11. Program for create and access Cursors
12. Program for create and access Triggers

TOTAL:48 HOURS

Course Objective:

Learn basic and fundamental computer graphics techniques, learn image synthesis techniques, and examine applications of modelling, design and visualization, how to draw pictures using Bresenham's line drawing, mid-point line drawing, mid-point circle drawing and Cohen-Sutherland line clipping

1. Write a C program with Fundamental Graphics function.
2. Write a C program to animate an Image.
3. Write a C program for different types of fonts and colors
4. Write a C program for Line drawing algorithm using DDA.
5. Write a C program for Line drawing algorithm using Bresenham's Technique.
6. Write a C program for Midpoint Circle Drawing Algorithm using Bresenham's Technique
7. Write a C program for Ellipse Drawing Algorithm using Bresenham's Technique
8. Write a C program for 2D Transformation in Translation
9. Write a C program for 2D Transformation in Rotations.
10. Write a C program 2D Transformation in Scaling.
11. Write a C program for 3D Transformation in Translation
12. Write a C program for 3D Transformation in Rotation

TOTAL: 48 HOURS

Course Objective:

Understand why quality is key in all of the testing stages in the Software Development Lifecycle, Understanding Requirements, Testing Techniques and Test Documentation and also focuses on testing at all stages of the software development life cycle.

Course Outcomes

CO1: Understand the importance of software quality/software testing and apply software testing techniques for information systems development.

CO2: Generate test cases from software requirements using various test processes for continuous quality improvement.

CO3: Apply software testing techniques in commercial environments and assess the adequacy of test suites using control flow, data flow, and program mutation.

CO4: Identify the inputs and deliverables of the testing process and work together as a team in preparing a report.

CO5: Use industry-standard testing tools.

UNIT I INTRODUCTION**9**

Introduction Purpose – Productivity and Quality in Software – Testing vs Debugging – Model for Testing – Bugs – Types of Bugs – Testing and Design Style.

UNIT II TESTING STRATEGIES**9**

Flow/Graphs and Path Testing – Achievable paths – Path instrumentation – Application – Transaction Flow Testing Techniques – Data Flow Testing Strategies

UNIT III DOMAIN TESTING**9**

Domain Testing Domains and Paths – Domains and Interface Testing – Linguistic – Metrics – Structural Metric – Path Products and Path Expressions.

UNIT IV TYPES OF TESTING**9**

Syntax Testing – Formats – Test Cases – Logic Based Testing – Decision Tables – Transition Testing – States, State Graph, State Testing.

UNIT V VALIDATION TOOLS**9**

Verification and Validation – Fundamental Tools – Levels of Testing – Testing Approaches – Types of Testing – Test Plan – Software Testing Tools Win Runner – Silk Test.

TOTAL: 45 HOURS

Text Books:

1. B. Beizer, “Software Testing Techniques”, DreamTech India, New Delhi. 2nd Edition, 2003.
2. K.V.K.K. Prasad, “Software Testing Tools”, DreamTech. India, New Delhi, 2005.

References:

- I. Burnstein, “Practical Software Testing”, Springer International Edition, 2005.
1. E. Kit, “Software Testing in the Real World Improving the Process”, Pearson Education, Delhi, 1995.
2. R.Rajani, and P.P.Oak, “Software Testing”, Tata McGraw Hill, New Delhi, 2004.

15MCA029**Introduction to PHP & MYSQL****4 003****Course Objective:**

To give basic Knowledge of PHP and MySQL, PHP form validation, Understand basic concepts of database stores information via tables. Learn how to retrieve and manipulate data from one or more tables. Updating and inserting data into existing. The advantages of store procedures with storing data using variables and functions.

Course Outcomes

CO1: Describe and Use the features and syntax of programming language PHP

CO2: Understand the methods GET and POST

CO3: Work html tags and PHP scripts

CO4: Retrieve, insert, update, and delete data from the relational database MySQL

UNIT I INTRODUCTION TO PHP**12**

Introduction to Open Source Technology –Introduction to PHP –How PHP works – the PHP.ini file – Basic PHP Syntax – PHP Tags – PHP Statements And Whitespace – Comments – PHP for Web Application – Variables – Variables Types –Variable Names(Identifiers) – Type Strength – Variable Scope – Superglobal– Constants Variable –

UNIT II ARRAYS AND CONTROL STRUCTURE**12**

Arrays – Types of Array, Multidimensional array, Variable, Contents, Operator In PHP. If–Else Statement, Nested If Statement, Switch Statement Looping Structure – For Loop, While Loop, Do While Loop, For each Loop.

UNIT III FUNCTIONS IN PHP

12

Definition and Syntax of Function, User Defined Function, System Defined Function, Parameterized and Non Parameterize Function. Date & Time Function, Hash Function, Mail Function, File Inclusion – Include(), Require(), String Function –Chr(), strlen(), strops(), strcmp().Testing and Manipulation Functions.

UNIT IV FILE HANDLING

12

Login Security Authentication (Users Logins) – Authorization (permissions) – Encryption – Session Cookies PHP Mail,File Handling,File Uploading.

UNIT V MYSQL DATABASE

12

What is Database?, Understanding Tables, Record & Fields, Working with PHP My Admin, SQL Data Types, Creating Database & Tables, Dropping Database & Tables, Adding Fields, Selecting Table, Alerting Fields Properties, SQL Queries.

TOTAL: 60 HOURS

Text books:

1. Leon Atkinson,“Core PHP Programming”, Pearson Publishers, Third Edition, 2004.
2. SteverHolzner, “The complete Reference PHP”, McGraw Hill, 2008.
3. Tim Converse, Joyce Park,Clark Morgan, “PHP 5.0 and MySQL Bible”, John Wiley&Sons, First Edition.

References:

1. Christopher Scollo,Harish Rawat,Deepak Thomas, “Beginning PHP 5.0 Database by Publisher”, WROX press, 2002.
2. Ashok Appu, “PHP – A beginners Guides”, WileyPublisher.
3. Steve Suehring , “MySQL Bible”, John Wiley &Sons
4. Peter Moulding, “PHP Black Book”
5. Tim converse, Joyce Park and Clark Morgan,“PHP 5 and MySQL”, Bible Wiley
6. Matt Doyle , “Beginning PHP 5.3 “, Word publication .

Course Objective:

The student will have the ability to use Visual Studio .NET effectively. To create a console based and web based application in .Net. .NET is a revolutionary concept on how software should be developed and deployed. An understanding of how to use forms to develop GUI programs under .NET.

Course Outcomes

CO1: Learn about MS.NET framework developed by Microsoft.

CO2: Understand the use of C# basics, Objects and Types, Inheritance.

CO3: Develop, implement and creating Applications with C#.

CO4: Display proficiency in C# by building stand-alone applications in the .NET framework using C#.

CO5: Separate page code from content by using code-behind pages, page controls, and Components.

CO6: Understand HTML controls, web server controls and validation controls.

CO7: Create a Web form with server controls.

CO8: Display dynamic data from a data source by using Microsoft ADO.NET and data binding.

CO9: Understand session management and cookies.

CO10: Familiarize with the Connected ADO.NET Architecture and Disconnected ADO.NET Architecture.

CO11: Create distributed data-driven applications using the .NET Framework, C#, SQL Server and ADO.NET.

UNIT I INTRODUCTION TO .NET TECHNOLOGIES**12**

Overview of .Net Framework – Feature Of .Net Framework – .Net framework class library – .NET Framework Components – Overview with Focus on CLR, CTS – MSIL – JIT – Assembly – DLL – Meta Data – Application Architecture.

UNIT II INTRODUCTION TO C#**12**

C# Building Blocks Introduction to C# – Overview – Types – Expressions – Declarations – Statements – Classes and Struts – OOPS – Constructors and Destructors

UNIT III BASIC WEB SERVER CONTROLS**12**

Windows Controls Basic web server controls – Rich web server Controls – ToolTip – ErrorProvider – MainMenu – ContextMenus – Common Dialogs – Date Time Picker – MonthCalendar – Splitter – HelpProvider – StatusBar – Notify Icon – Print Related

UNIT IV ADVANCED .NET CONTROLS

12

Web Server List ControlsCheckBox List – Radio Button List – Drop down List – List Box – Bulleted List. Data ControlsData Grid – Repeater Control – Grid View–Other Web Server ControlsNavigation Controls And Validation Controls.

UNIT VOBJECTS AND ADVANCED CONCEPTS IN ASP.NET

12

Request Object – Response Object – State Management for Session,Application, Cookies, Query String –Introduction to ADO.NET – ADO Vs ADO.NET – Connected ADO.NET Architecture – Disconnected ADO.NET Architecture – Data Reader – Data Adapter – ADO.NET Classes.

TOTAL: 60 HOURS

Text Books:

1. Andrew Troelsen, “C# and the .Net platform”,apress,(UNIT I and UNIT II), 2001.
2. MridulaParihar,et.al. “ASP .NET Bible”, Wiley–DreamTech India Pvt.Ltd,–2002.

References:

1. David S. Platt–“Introducing .Net”, Microsoft press, 2002.
2. Alex Homer et. Al, “professional ASP .NET 1.1”,Wiley DreamTech India Pvt. Ltd.2004.
3. Rebecaam. Riordan, “ADO .NET Step By Step”, Microsoft Press.

15MCA031

DATA WAREHOUSING AND DATA MINING

40 0 3

Course Objective:

This course helps the students to understand the overall architecture of a data warehouse and techniques and methods for data gathering and data pre–processing .The different data mining models and techniques will be discussed in this course. It makes the students to understand and implement classical algorithms in data mining and data warehousing; students will be able to assess the strengths and weaknesses of the algorithms, identify the application area of algorithms, and apply them.

Course outcomes

CO1: To introduce the basic concepts of Data Warehouse and Data Mining techniques.

CO2: Examine the types of the data to be mined and apply pre-processing methods on raw data.

CO3:Discover interesting patterns, analyse supervised and unsupervised models and estimate the accuracy of the algorithms.

CO4: Describe the fundamental concepts, benefits and problem areas associated with data warehousing

CO5: Describe the various architectures and main components of a data warehouse.

CO6: Design a data warehouse, and be able to address issues that arise when implementing a data warehouse.

CO7 : Compare and contrast OLAP and data mining as techniques for extracting knowledge from a data warehouse

UNITI INTRODUCTION 12

Data Mining Tasks – Data Mining Versus KDD– Relational Databases – Data Warehouses – Transaction Databases –Object Oriented Databases – Spatial Databases – Temporal Databases – Text And Multimedia Databases –Heterogeneous Databases – Social Implications of Data Mining.

UNITII DATA PREPROCESSING 12

Data Preprocessing – Data Cleaning, Integration and Transformation, Reduction, Discretization and concept hierarchy generation.

UNITIII DATAMINING TECHNIQUES 12

Association Rule Mining – The Apriori Algorithm – Multilevel Association Rules – Constraint Based Association Mining – Mining Association Rules In Large Databases.

UNITIV CLASSIFICATION AND PREDICTION 12

Issues Regarding Classification And Prediction–Classification By Decision Tree Induction–Bayesian Classification–Back Propagation–Prediction–Classifier Accuracy.

**UNITV CLUSTER TECHNIQUES
12**

Clusters AnalysisType Of Data In Cluster Analysis – Categorization of Major Clustering MethodsPartitioning Methods – Hierarchical Methods – Case Studies – Mining WWW– Mining Text Database –Mining spatial database.

TOTAL:45 HOURS

Text Books:

1. Jiawei Han, MichelineKamber, “Data Mining Concepts and Techniques “, Morgan Kaufmann Publishers, 2002.
2. Alex Berson, Stephen J. Smith, “Data Warehousing, Data mining & OLAP “, Tata McGrawHill, 2004.

References:

1. UsamaM.Fayyad, Gregory Piatetsky, Shapiro, Padhrai Smyth and RamasamyUthurusamy, “Advances in Knowledge Discovery and Data Mining”, the M.I.T Press, 1996.
2. Ralph Kimball, “The Data warehouse Life Cycle Toolkit “, John Wiley & sons Inc., 1998.

Course Objective:

Understand the usage of PHP and MySQL in dynamic web development, understand PHP language data types, logic controls, built-in and user-defined functions, be able to setup and configure MySQL, PHP, Apache web server development environment, Select, insert, update and delete data using SQL language, understand Object oriented programming paradigm in PHP, Build a simple, yet functional web application using PHP/MySQL.

1. Write PHP script to display person age and name using post method.
2. PHP script for sorting the marks
3. Write PHP script to change color as per radio button selection.
4. Write PHP script to display images depends on check box selection.
5. Design of admission form using PHP–MYSQL
6. Building a web–based e–mail services
7. Building web forums
8. Creating & updating and inserting into database & simple queries
9. Write PHP script to upload file.
10. Write PHP script to connect to MySQL database, insert data, and fetch data from table.
11. Write PHP script to upload and fetch image from MySQL database
12. Write PHP script that maintain session and set cookie of username and password.

TOTAL: 48 HOURS**Course Objective:**

The student will be able to:

Build web applications using ASP.Net, create web forms, apply ADO.Net, validate form data using server-side Validation controls, and create dynamic Web applications that interact with a database using server-side programming

ASP.NET

1. Working with Basic Html controls
2. Working with Basic Web Server Controls
3. Working with Basic Web Server List Controls

4. Working with Rich Web Server Controls
5. Write a .NET desktop application to demonstrate how to use a Timer control to create a logon program with a password time-out feature.
6. Write a .NET desktop application to demonstrate how to create and manipulate large integer arrays, and demonstrates the Array concepts.
7. Working with Verification and Validation
8. Working with Windows Application (Calculator)
9. Working with Navigation Control
10. Working with Query String
11. Create a web application and demonstrate session state within a web application.
12. Working with Database Connection using MS Access or SQL

TOTAL: 48 HOURS

15MCA034

MINI PROJECT

0042

Each student will develop and implement individually application software based on any emerging latest technologies.

TOTAL: 48 HOURS

15MCA035

MAIN PROJECT

00020

Project Work can be carried out individually in an R&D Section of any Industry or University or in the Institute in which Candidate is Studying. The Project Work/Dissertation Report Shall be Submitted through the Guides/Supervisors to the Head of the Department and then to the University not later than 31st May/31st December. If He / She Fails to Submit the Project Work/Dissertation within the Stipulated Date for a Particular Semester, Project/Dissertation Evaluation and Viva-Voce shall be conducted by one External Examiner And one Internal Examiner who shall normally be The Project Guide.

Continuous Internal Assessment 50 Marks

Dissertation 100 Marks

Viva-Voce 50 Marks

Reviews	Details To Submit
1 st Review	Company Profile, Project Title, Software Used (Front And Back End)& Confirmation Letter
2 nd Review	PPT Presentation About The Project And Its Salient Features
3 rd Review	PPT Presentation Of Abstract & Explanation Of Project With Tables, Forms And Analysis Report.

4 th Review	PPT Presentation Of Complete Flow Of Project With Design Tools. Live Demo If Possible
5 th Review	Submission Of Final ProjectDissertation In The Prescribed Format (2 Copies) + 1CD

Note: Rough Documentation Should Be Shown to the Respective Guide Before Binding.

Syllabus of Discipline Specific Elective Courses

15MCA101 ESSENTIALS OF INFORMATION TECHNOLOGY 3003

Course Objective:

To understand the basics of computers, problem solving techniques, file handling and database concepts, Analysis and Design varied roles of information systems software development life cycle human factors develop interpersonal and analytic skills design a large information system group design effort communicate design orally and in writing data modeling

UNIT I INTRODUCTION TO COMPUTER SYSTEM 9

Basics of computer systems – Various hardware components – Data storage and various memory Units – Central processing unit– Execution cycle – Introduce to software and its classification.

UNIT II PROBLEM SOLVING TECHNIQUES 9

Introduction to Problem Solving – Computational Problem and its Classification – Logic and its Types – Introduction to Algorithms – Implementation of Algorithms using Flowchart – Flowcharts Implementation through RAPTOR Tool – Searching and Sorting Algorithms – Introduction and Classification to Data Structures – Basic Data Structures – Advanced Data Structures.

UNIT III PROGRAMMING BASICS 9

Introduction to Programming Paradigms and Pseudo Code – Basic Programming Concepts – Program Life Cycle – Control Structures – Introduction and Demonstration of 1-D Array And 2-D Array – Searching and Sorting Techniques – Demonstration Concepts of Memory References in Arrays – Strings – Compiler Concepts – Code Optimization Techniques. Structured Programming – Functions – Structures – File Handling – Introduction to Software Development Life Cycle – Industry Coding Standards and Best Practices – Testing and Debugging – Code Review.

UNIT IV PROJECT 9

Project Specification – Preparation of High Level Design and Detailed Design Document, UNIT Test Plan and Integrated Test Plan – Coding and UNIT Testing Activities – Integration Testing.

RDBMS – Data Processing – The Database Technology – Data Models – ER Modeling Concept – Notations – Extended ER Features – Logical Database Design – Normalization – SQL – DDL Statements – DML Statements – DCL Statements – Joins – Sub queries – Views – Database Design Issues.

TOTAL: 45 HOURS

Text Books:

1. Andrew S.Tanenbaum,“Structured Computer Organization”, PHI,4thedition, 2010.
2. Dromey,R.G,“How to solve it by computers”,Prentice Hall,2005.
3. Alfred V.Aho,Ullman,Hopcroft,“Data Structures and Algorithms”,Addison–Wesley.
4. YashwantKanitker,Let Us C, “YashwanthKanitkar”,Second Edition.
5. AhoAlfred V.Compiler,“Principles,Techniques and Tools”,Pearson Education.
6. Henry F Korth,AbrahamSilberschatz,“Database System Concepts”, 2nd Edition,McGrawHill International editions,Computer science series, 2012.

References:

1. John L.Hennessy,David Goldberg,David A.Patterson,“Computer Architecture A Quantitative Approach”,Morgan Kaufman Publishers, Second Edition, 1996.
2. Silberschatz and Galvin, “Operating System Concepts”, John Wiley & Sons, Sixth edition.
3. Andrew Tanenbaum,“Modern Operating System Concepts”, Pearson Education.
4. Milan Milenkovic,“Operating Systemconcepts and design”, McGraw–Hill.
5. Charles Crowley,“OperatingSystem A Design–oriented Approach”.
6. Lipschutz, Seymour & G A V Pai, “Data Structures”, Tata McGraw–Hill.
7. Baldwin,Douglas &Scragg, Greg W., “Algorithms and Data Structures the Science of Computing”,DreamTech.
8. Kernighan,Ritchie, “ANSI C Language”,Prentice Hall of India, New Delhi, 1992.
9. Schaum series,“Programming in C”, 3rd Edition.
10. Jon Bentley, “Programming Pearls”,Pearson Education Publication.
11. Tharp Alan L, “File Organization and Processing”,John Willey and Sons.
12. Elmasri, Navathe, “Fundamentals of Database Systems”, Addison Wesley,Third edition.
13. C.J.Date,“An Introduction to Database Systems”,Narosa Publication, 6th Edition.

Course Objective:

To define and highlight importance of software project management. To formulate strategy in managing projects. To estimate the cost associated with a project. To plan, schedule and monitor projects for the risk management. To define the software management metrics. To train software project managers and other individuals involved in software project planning and tracking and oversight in the implementation of the software project management process

UNIT I INTRODUCTION**9**

Introduction to Competencies – Product Development Techniques – Management Skills – Product Development Life Cycle – Software Development Process and models – The SEI CMM – International Organization for Standardization.

UNIT II DOMAIN PROCESSES**9**

Managing Domain Processes – Project Selection Models – Project Portfolio Management – Financial Processes – Selecting a Project Team – Goal and Scope of the Software Project – Project Planning – Creating the Work Breakdown Structure – Approaches to Building a WBS – Project Milestones – Work Packages – Building a WBS for Software.

UNIT III SOFTWARE DEVELOPMENT**9**

Tasks and Activities – Software Size and Reuse Estimating – The SEI CMM – Problems and Risks – Cost Estimation – Effort Measures – COCOMO. A Regression Model – COCOMO II – SLIM, A Mathematical Model – Organizational Planning – Project Roles and Skills Needed.

UNIT IV SCHEDULING ACTIVITIES**9**

Project Management Resource Activities – Organizational Form and Structure – Software Development Dependencies – Brainstorming – Scheduling Fundamentals – PERT and CPM – Leveling Resource Assignments – Map the Schedule to a Real Calendar – Critical Chain Scheduling.

UNIT V QUALITY ASSURANCE**9**

Quality Requirements – The SEI CMM – Guidelines – Challenges – Quality Function Deployment – Building the Software Quality Assurance – Plan – Software Configuration Management Principles – Requirements – Planning and Organizing – Tools – Benefits – Legal Issues in Software – Case Study.

TOTAL: 45 HOURS

Text Book:

1. Robert T. Futrell, Donald F. Shafer, Linda I. Safer, “Quality Software Project Management”, Pearson Education, Asia, 2002.

References:

1. PankajJalote, “Software Project Management in Practice”, Addison Wesley, 2002.
2. Hughes, “Software Project Management, 3rdEdition”, Tata McGrawHill, 2004.

15MCA103**INTERNET OF THINGS****3 00 3**

Course Objective:To learn the basic issues, policy and challenges in the Internet. To understand the components and the protocols in Internet. To build a small low cost embedded system with the internet. To understand the various modes of communications with internet. To learn to manage the resources in the Internet. To deploy the resources into business. To understand the cloud and internet environment.

UNIT I INTRODUCTION**9**

Definition – phases – Foundations – Policy– Challenges and Issues – identification – security – privacy. Components in internet of things Control UNITS – Sensors – Communication modules – Power Sources – Communication Technologies – RFID – Bluetooth – Zigbee – Wi-Fi – Rflinks – Mobile Internet – Wired Communication.

UNIT II PROGRAMMING THE MICROCONTROLLER FOR IOT**9**

Basics of Sensors and actuators – examples and working principles of sensors and actuators – Cloud computing and IOT – Arduino/Equivalent Microcontroller platform – Setting up the board – Programming for IOT – Reading from Sensors Communication Connecting Microcontroller With Mobile Devices – Communication Through Bluetooth and USB – Connection With The Internet Using Wi-Fi / Ethernet

UNIT III RESOURCE MANAGEMENT IN THE INTERNET OF THINGS**9**

Clustering – Software Agents – Data Synchronization – Clustering Principles in an Internet of Things Architecture – The Role of Context – Design Guidelines –Software Agents for Object – Data Synchronization– Types of Network Architectures –Enabling Autonomy and Agility by the Internet of Things–Technical Requirements for Satisfying the New Demands in Production – The Evolution from the RFID–based EPC Network to an Agent based Internet of Things– Agents for the Behaviour of Objects.

UNIT IV BUSINESS MODELS FOR THE INTERNET OF THINGS**9**

The Meaning of DiY in the Network Society– Sensor–actuator Technologies and Middleware as a Basis for a DiY Service Creation Framework – Device Integration – Middleware Technologies Internet of Things Semantic Interoperability as a Requirement for DiY Creation –Ontology– Value Creation in the

Internet of Things–Application of Ontology Engineering in the Internet of Things–Semantic Web–
Ontology – The Internet of Things in Context of EURIDICE – Business Impact

UNIT V FROM THE INTERNET OF THINGS TO THE WEB OF THINGS

9

Resource–oriented Architecture and Best Practices– Designing Restful Smart Things – Web– enabling
Constrained Devices – The Future Web of Things – Set up cloud environment – send data from
microcontroller to cloud – Case studies – Open Source e–Health sensor platform – Be Close Elderly
monitoring – Other recent projects.

TOTAL: 45 HOURS

Text Books:

1. CharalamposDoukas, “Building Internet of Things with the Arduino”, Create space, April 2002.
2. Dieter Uckelmann et.al, “Architecting the Internet of Things”, Springer, 2011

References:

1. <http://postscapes.com/>
2. <http://www.theinternetofthings.eu/what-is-the-internet-of-things>

15MCA104

MOBILE COMPUTING

4004

Course Objective:

To understand the basics of Mobile computing. To learn the role of wireless networks in Mobile
Computing. To study about the underlying wireless networks. To understand the architectures of
mobile. To become familiar with the mobile computing platforms

UNIT I WIRELESS COMMUNICATION FUNDAMENTALS

12

Introduction – Wireless transmission – Frequencies for radio transmission – Signals – Antennas – Signal
Propagation – Multiplexing – Modulations – Spread spectrum – MAC – SDMA – FDMA – TDMA –
CDMA – Cellular Wireless Networks.

UNITII TELE COMMUNICATION NETWORKS

12

Telecommunication systems – GSM – GPRS – DECT – UMTS – IMT–2000 – Satellite Networks –
Basics – Parameters and Configurations – Capacity Allocation – FAMA and DAMA – Broadcast
Systems – DAB – DVB.

UNITIII WIRELESS LAN

12

Wireless LAN – IEEE 802.11 – Architecture – services – MAC – Physical layer – IEEE 802.11a –
802.11b standards – HIPERLAN – Blue Tooth.

UNITIV MOBILE NETWORK LAYER **12**

Mobile IP – Dynamic Host Configuration Protocol – Routing – DSDV – DSR – Alternative Metrics.

UNIT V TRANSPORT AND APPLICATION LAYERS **12**

Traditional TCP – Classical TCP improvements – WAP, WAP 2.0.

TOTAL: 60 HOURS

Text Books:

1. Jochen Schiller, “Mobile Communications”, PHI/Pearson Education, Second Edition, 2003. (UNIT I Chap 1,2 &3–UNIT II chap 4,5 &6–UNIT III Chap 7.UNIT IV Chap 8–UNIT V Chap 9&10.)
2. William Stallings, “Wireless Communications and Networks”, PHI/Pearson Education, 2002. (UNIT I Chapter – 7&10–UNIT II Chap 9)

References:

1. KavehPahlavan, PrasanthKrishnamoorthy, “Principles of Wireless Networks”, PHI/Pearson Education, 2003.
2. UweHansmann, LotharMerk, Martin S. Nicklons and Thomas Stober, “Principles of Mobile Computing”, Springer, New York, 2003.
3. HazysztowWesolowshi, “Mobile Communication Systems”, John Wiley and Sons Ltd, 2002.

15MCA105 COMPILER DESIGN 4 004

Course Objective:

To understand the various optimization techniques. To understand about compiler’s instruction selection and scheduling techniques. To explore how parallelism is handled by compilers. To understand how compilers deal with pipelining architecture. To appreciate the just-in-time compilations

UNIT I INTRODUCTION **12**

Compilers – Analysis of the source program – Phases of a compiler – Cousins of the Compiler – Grouping of Phases – Compiler construction tools – Lexical Analysis – Role of Lexical Analyzer – Input Buffering – Specification of Tokens

UNIT II PARSERS **12**

Role of the parser, Writing Grammars – Context – Free Grammars – Top Down parsing – Recursive Descent parsing – Predictive parsing – bottom-up parsing– shift Reduce Parsing – Operator Precedent Parsing – LR Parsers – SLR Parser– Canonical LR Parser – LALR Parser

UNIT III EXPRESSIONS **12**

Intermediate Languages – Declarations – Assignment Statements – Boolean Expressions – Case Statements – Back patching – procedure calls

UNIT IV OPTIMIZATION TECHNIQUES

12

Issues in the design of code generator – The target machine – Runtime Storage management – Basic Blocks and Flow Graphs – Next use Information – A simple Code generator – DAG representation of Basic Blocks – Peephole optimization.

UNIT V STORAGE

12

Introduction – Principal Sources of Optimization – Optimization of basic Blocks – Introduction to Global Data Flow Analysis – Runtime Environments – Source Language issues – Storage Organization – Storage Allocation strategies – Access to non-local names – Parameter Passing.

TOTAL: 60 HOURS

Text Book:

1. Alfred Aho, Ravi Sethi, Jeffrey D. Ullman, “Compilers – Principles, Techniques and Tools”, Pearson Education Asia, 2003.

References:

1. Henk Alblas and Albert Nymeyer, “Practice and Principles of Compiler Building with C”, PHI, 2001
2. Kenneth C. Loudon, “Compiler Construction Principles and Practices”, Thompson Learning, 2003.

15MCA106

CLOUD COMPUTING

4004

Course Objective: To introduce the broad perspective of cloud architecture and model. To understand the concept of Virtualization and design of cloud Services. To be familiar with the lead players in cloud. To understand the features of cloud simulator. To apply different cloud programming model as per need. To learn to design the trusted cloud Computing system

UNIT I CLOUD ARCHITECTURE AND MODEL

12

Technologies for Network-Based System – System Models for Distributed and Cloud Computing – NIST Cloud Computing Reference Architecture. Cloud Models – Characteristics – Cloud Services – Cloud models (IaaS, PaaS, SaaS) – Public vs Private Cloud – Cloud Solutions – Cloud ecosystem – Service management – Computing on demand.

UNIT II VIRTUALIZATION

12

Basics of Virtualization – Types of Virtualization – Implementation Levels of Virtualization – Virtualization Structures – Tools and Mechanisms – Virtualization of CPU, Memory, I/O Devices – Virtual Clusters and Resource management – Virtualization for Data-center Automation.

UNIT III CLOUD INFRASTRUCTURE

12

Architectural Design of Compute and Storage Clouds – Layered Cloud Architecture Development – Design Challenges – Inter Cloud Resource Management – Resource Provisioning and Platform Deployment – Global Exchange of Cloud Resources.

UNITIV PROGRAMMING MODEL

12

Parallel and Distributed Programming Paradigms – MapReduce , Twister and Iterative MapReduce – Hadoop Library from Apache – Mapping Applications – Programming Support – Google App Engine, Amazon AWS – Cloud Software Environments –Eucalyptus, Open Nebula, OpenStack, Aneka, CloudSim

UNIT V SECURITY IN THE CLOUD

12

Security Overview – Cloud Security Challenges and Risks – Software-as-a-Service Security – Security Governance – Risk Management – Security Monitoring – Security Architecture Design – Data Security – Application Security – Virtual Machine Security – Identity Management and Access Control – Autonomic Security.

TOTAL: 60 HOURS

Text Books:

1. Kai Hwang, Geoffrey C Fox, Jack G Dongarra, “Distributed and Cloud Computing, From Parallel Processing to the Internet of Things”, Morgan Kaufmann Publishers, 2012.
2. John W.Rittinghouse and James F.Ransome, “Cloud Computing Implementation, Management, and Security”, CRC Press, 2010.
3. Toby Velte, Anthony Velte, Robert Elsenpeter, “Cloud Computing, A Practical Approach”, TMH, 2009.
4. Kumar Saurabh, “Cloud Computing – insights into New–Era Infrastructure”, Wiley India,2011.
5. George Reese, “Cloud Application Architectures Building Applications and Infrastructure in the Cloud” O'Reilly.

References:

1. James E. Smith, Ravi Nair, “Virtual Machines Versatile Platforms for Systems and Processes”, Elsevier/Morgan Kaufmann, 2005.
2. Katarina Stanoevska–Slabeva, Thomas Wozniak, SantiRistol, “Grid and Cloud Computing – A Business Perspective on Technology and Applications”, Springer.
3. Ronald L. Krutz, Russell Dean Vines, “Cloud Security – A comprehensive Guide to Secure Cloud Computing”, Wiley – India, 2010.
4. RajkumarBuyya, Christian Vecchiola, S.ThamaraiSelvi, ‘Mastering Cloud Computing’, Tata McGrawHill,2013.
5. Gautam Shroff, “Enterprise Cloud Computing”,Cambridge University Press,2011 11. Michael Miller, Cloud Computing,Que Publishing,2008.
6. Nick Antonopoulos, “Cloud computing,Springer”, Publications,2010

Course Objective:

MIS is very useful for efficient and effective planning and control functions of the management. Management is the art of getting things done through others. MIS will be instrumental in getting the things done by providing quick and timely information to the management. Reports give an idea about the performance of men, materials, machinery, money and management. Reports throw light on the utilization of resources employed in the organization.

UNIT I INTRODUCTION TO INFORMATION SYSTEMS 9

Why study Information System – Why Business need Information Technology – Fundamentals of Information System – Overview of Information Systems.

UNIT II SOLVING BUSINESS PROBLEMS WITH INFORMATION SYSTEMS 9

System Approach to Problem Solving – Developing Information System Solution – Database Management Managing Data Resources – Technical Foundations of database Management.

UNIT III INFORMATION SYSTEMS FOR STRATEGIC ADVANTAGES 9

Fundamentals of Strategic Advantage Strategic Applications and Issues in It; Managing IT Enterprise and Global Management

UNIT IV BUSINESS APPLICATIONS OF INFORMATION TECHNOLOGY 9

The Internet and Electronic Commerce – Fundamentals of Electronic Commerce – Information System for Business Operations Business Information System – Transaction – processing Systems.

UNIT V INFORMATION SYSTEMS FOR MANAGERIAL DECISION SUPPORT 9

Decision Support Systems Artificial Intelligence technology in Business – Managing IT – Planning for Business change with IT – Implementing business change with IT – Security & Control Issues in I/S – Ethical and societal challenges of Information Technology.

TOTAL: 45 HOURS**Text Book**

1. James A. O'Brien, "Management Information Systems", Galgotia publications, Fourth Edition, 1999.

References:

1. Gordon B. Davis Margret the H. Olson, "Management Information Systems", McGraw Hill, 3rd Reprint 2000.

Course Objective:

To establish a social system in the organization. To determine the motivation level of employees. To encourage the people, to work enthusiastically in the organization. To create an environment for the development of effective leadership. To develop effective group behavior among the employees. To identify the reasons for conflict and to resolve the conflict.

UNIT I ORGANISATIONAL BEHAVIOUR**9**

Management roles–Management skills challenges and opportunities for OB–models of OB foundation of HRM & OB–Historical development of HR & OB–Research foundation of OB Communication–the two way communication

UNIT II PERSONALITY**9**

Personality determinants–personality attribute that OB–attitude–concept of attitude–type & function of attitude–motivation–theories of motivation - Perception perceptual selectivity–social perception

UNIT III LEADERSHIP**9**

Leadership theories–conflicts–types of conflict–conflict process–work team–benefit of work team–types of work team–shaping individual to team player & TQM

UNIT IV ORGANISATIONAL CHANGE**9**

Forces of change–Lewin’s three step model to O.C–Work stress and stress management–organizational development–O.D Pros–client–consultant relationship–organizational development intervention–types of intervention

UNIT V ORGANISATIONAL STRUCTURE**9**

Elements to design an organization structure–Types of organization–line organization function organization–line and staff organization–division organization–matrix organization–virtual organization

TOTAL: 45 HOURS**Text Book**

1. Prasad, L. M, “Organizational Behaviour”, Sultan S. Chand & Co. 5th Revised Edition Reprint 2014
2. Saiyadain, M. S, “Organizational Behaviour”, TMH Publisher, 2004
3. Sekaran & Uma, “Organizational Behaviour” Text & Cases, Tata McGraw Hill Public Company Ltd., New Delhi, 2005.
4. K. Aswathappa, , Organizational Behaviour – Text , Cases and Games, Himalaya Publishing House , 2006

Text Book:

1. Ali Bahrami, "Object Oriented Systems Development", McGraw Hill International Edition, 1999.

References:

1. Grady Booch, "Object Oriented Analysis and design", Addison Wesley, 2nd, Edition, 1999.

15MCA110 BUSINESS INTELLIGENCE AND ITS APPLICATION 3 003**Course Objective:**

The objective of this course is for the students to achieve a profound understanding of Business Intelligence (BI) systems in terms of its tools, current practices and impacts. The students should acquire knowledge on how to design BI solutions for different BI targets and users.

UNIT I INTRODUCTION TO BUSINESS INTELLIGENCE 9

Introduction to OLTP and OLAP, BI Definitions & Concepts, Business Applications of BI, BI Framework, Role of Data warehousing in BI, BI Infrastructure components – BI process, BI Technology, BI Roles & Responsibilities.

UNIT II BASICS OF DATA INTEGRATION 9

Concepts of data integration need and advantages of using data integration, introduction to common data integration approaches, introduction to ETL using SSIS, Introduction to data quality, data profiling concepts and applications.

UNIT III INTRODUCTION TO MULTI-DIMENSIONAL DATA MODELING 9

Introduction to data and dimension modeling, multidimensional modeling vs. multi-dimensional modeling, concepts of dimensions, facts, cubes, attributes, hierarchies, star and snowflake schema, introduction to business metrics and KPIs, creating cubes using SSAS.

UNIT IV ENTERPRISE REPORTING 9

Basic of Enterprise Reporting, Introduction to enterprise reporting, concepts of dashboards, balanced scorecards, introduction to SSRS Architecture, enterprise reporting using SSRS.

UNIT V CASE STUDY 9

A project that allows the students to apply Technical, Behavioral and Process concepts learnt in the elective course by

- Executing near real-life project (with large data).
- Working in teams (Project teams will ideally comprise of 4 members).
- Experiencing expectations from different roles.

TOTAL: 45 HOURS

Text Books

1. David Loshin, “Business Intelligence”.
2. Mike Biere, “Business intelligence for the enterprise”.
3. Larissa Terpeluk Moss, ShakuAtre, “Business intelligence roadmap”.
4. CindiHowson, “Successful Business Intelligence Secrets to making killer BI applications”.

References:

1. Brain, Larson, “Delivering business intelligence with Microsoft SQL server”, 2008.
2. Lynn Langit, “Foundations of SQL server 2005 Business intelligence”.

15MCA111

NETWORK SECURITY

3003

Course Objective:

To understand Network Devices functions and configurations hub, switch, tap and Routers, Understand Network Security Devices (IDS, Firewall..Etc.), Understand and analyse network services, Understand network–troubleshooting concepts, Understand network security concepts, Understand network intrusions

UNIT I INTRODUCTION

9

Attacks – Services – Mechanisms – Conventional Encryption – Classical and Modern Techniques – Encryption Algorithms – Confidentiality.

UNIT II PUBLIC KEY ENCRYPTION

9

Public key cryptography RSA (Rivestshamir-adleman) algorithm – Elliptic Curve Cryptography – Number Theory Concepts – Modular arithmetic – Euler’s theorem.

UNIT III MESSAGE AUTHENTICATION

9

Message Authorization and Hash Functions- Authentication Requirements – Digest Function – Digital Signatures – Digital signature Standards.

UNIT IV NETWORK SECURITY PRACTICE

9

Authentication Protocols, Authentication Applications – Electronic Mail Security – Internet Protocol Security – Web Security.

UNIT V SYSTEM SECURITY

9

Introduction to security attacks - Intruders –Types of Intruders – Viruses – Worms – Firewalls Design Principles –Trusted Systems.

TOTAL: 45 HOURS

Text Book

1. Stallings, “Cryptography & Network Security – Principles & Practice”, Prentice Hall, 3rd Edition 2002.

References:

1. Bruce, Schneier, “Applied Cryptography”, Toha Wiley & Sons, 2nd Edition, 1996.
2. Man Young Rhee, “Internet Security”, Wiley, 2003.
3. Pfleeger&Pfleeger, “Security in Computing”, Pearson Education, 3rd Edition, 2003.

15MCA112

AD HOC NETWORKS

3003

Course Objective

To understand the state-of-the-art in network protocols, architectures and applications, Analyze existing network protocols and networks, Develop new protocols in networking, To understand how networking research is done, To investigate novel ideas in the area of Networking via term-long research projects.

UNIT I. INTRODUCTION

9

Introduction–Fundamentals of Wireless Communication Technology – The Electromagnetic Spectrum – Radio Propagation Mechanisms – Characteristics of the Wireless Channel – IEEE 802.11a,b Standard – Origin Of Ad hoc Packet Radio Networks – Technical Challenges – Architecture of PRNETs – Components of Packet Radios – Ad hoc Wireless Networks –What Is an Ad Hoc Network? Heterogeneity in Mobile Devices – Wireless Sensor Networks – Traffic Profiles – Types of Ad hoc Mobile Communications – Types of Mobile Host Movements – Challenges Facing Ad Hoc Mobile Networks–Ad hoc wireless Internet

UNIT II AD HOC ROUTING PROTOCOLS

9

Introduction – Issues in Designing a Routing Protocol for Ad Hoc Wireless Networks – Classifications of Routing Protocols –Table–Driven Routing Protocols – Destination Sequenced Distance Vector (DSDV) – Wireless Routing Protocol (WRP) – Cluster Switch Gateway Routing (CSGR) – Source–Initiated On–Demand Approaches – Ad Hoc On–Demand Distance Vector Routing (AODV) – Dynamic Source Routing (DSR) –Temporally Ordered Routing Algorithm (TORA) – Signal Stability Routing (SSR) – Location–Aided Routing (LAR) – Power–Aware Routing (PAR) – Zone Routing Protocol (ZRP)

UNIT III MULTICASTROUTING IN AD HOC NETWORKS

9

Introduction – Issues in Designing a Multicast Routing Protocol – Operation of Multicast Routing Protocols – An Architecture Reference Model for Multicast Routing Protocols –Classifications of Multicast Routing Protocols – Tree–Based Multicast Routing Protocols– Mesh–Based Multicast Routing Protocols – Summary of Tree–and Mesh–Based Protocols – Energy–Efficient Multicasting – Multicasting with Quality of Service Guarantees – Application–Dependent Multicast Routing – Comparisons of Multicast Routing Protocols

UNIT IV TRANSPORT LAYER, SECURITY PROTOCOLS

9

Introduction – Issues in Designing a Transport Layer Protocol for Ad Hoc Wireless Networks – Design Goals of a Transport Layer Protocol for Ad Hoc Wireless Networks –Classification of Transport Layer Solutions – TCP Over Ad Hoc Wireless Networks –Other Transport Layer Protocols for Ad Hoc Wireless Networks – Security in Ad Hoc Wireless Networks – Network Security Requirements – Issues and Challenges in Security Provisioning – Network Security Attacks – Key Management – Secure Routing in Ad Hoc Wireless Networks

UNIT V QOS AND ENERGY MANAGEMENT

9

Introduction – Issues and Challenges in Providing QoS in Ad Hoc Wireless Networks –Classifications of QoS Solutions – MAC Layer Solutions – Network Layer Solutions –QoS Frameworks for Ad Hoc Wireless Networks Energy Management in Ad Hoc Wireless Networks –Introduction – Need for Energy Management in Ad Hoc Wireless Networks – Classification of Energy Management Schemes – Battery Management Schemes – Transmission Power Management Schemes – System Power Management Schemes

TOTAL: 45 HOURS

Text Book:

1. C. Siva Ram Murthy and B.S. Manoj “Ad Hoc Wireless Networks Architectures and Protocols”, Prentice Hall PTR, 2004.

References:

1. C.K. Toh, “Ad Hoc Mobile Wireless Networks Protocols and Systems”, Prentice Hall PTR, 2001

15MCA113

BIG DATA ANALYTICS

3 00 3

Course Objective:

To explore the fundamental concepts of big data analytics, To learn to analyze the big data using intelligent techniques, To understand the various search methods and visualization techniques, To learn to use various techniques for mining data stream, To understand the applications using Map Reduce Concepts.

UNIT I INTRODUCTION TO BIG DATA

9

Introduction to BigData Platform – Challenges of Conventional Systems – Intelligent data analysis – Nature of Data – Analytic Processes and Tools – Analysis vs Reporting – Modern Data Analytic Tools – Statistical Concepts Sampling Distributions – Re-Sampling – Statistical Inference – Prediction Error.

UNIT II MINING DATA STREAMS

9

Introduction To Streams Concepts – Stream Data Model and Architecture – Stream Computing – Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream – Estimating Moments – Counting Oneness in a Window – Decaying Window – Real time Analytics Platform(RTAP) Applications – Case Studies – Real Time Sentiment Analysis, Stock Market Predictions.

UNIT III HADOOP

9

History of Hadoop– The Hadoop Distributed File System – Components of Hadoop–Analysing the Data with Hadoop– Scaling Out–Hadoop Streaming– Design of HDFS–Java interfaces to HDFS– Basics– Developing a Map Reduce Application–How Map Reduce Works–Anatomy of a Map Reduce Job run– Failures–Job Scheduling–Shuffle and Sort – Task execution – Map Reduce Types and Formats– Map Reduce Features

UNIT IV HADOOP ENVIRONMENT

9

Setting up a Hadoop Cluster – Cluster specification – Cluster Setup and Installation –Hadoop Configuration–Security in Hadoop– Administering Hadoop – HDFS – Monitoring–Maintenance–Hadoop benchmarks–Hadoop in the cloud

UNIT V FRAMEWORKS

9

Applications on Big Data Using Pig and Hive – Data processing operators in Pig – Hive services – HiveQL – Querying Data in Hive – fundamentals of HBase and ZooKeeper– IBM InfoSphereBigInsights and Streams. Visualizations – Visual data analysis techniques, interaction techniques; Systems and applications

TOTAL: 45 HOURS

Text Books:

1. Michael Berthold, “Intelligent Data Analysis”,David J. Hand,”, Springer, 2007.
2. Tom White “ Hadoop The Definitive Guide”, O’reilly Media, Third Edition, 2012.
3. Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos, “Understanding Big Data Analytics for Enterprise Class Hadoop and Streaming Data”, McGrawHill Publishing, 2012
4. AnandRajaraman and Jeffrey David Ullman, “Mining of Massive Datasets”, Cambridge University Press, 2012.
5. Bill Franks, “Taming the Big Data Tidal Wave Finding Opportunities in Huge Data Streams with Advanced Analytics”, John Wiley & sons, 2012.
6. Glenn J. Myatt, “Making Sense of Data”, John Wiley & Sons, 2007.

References:

1. Pete Warden, “Big Data Glossary”, O’Reilly, 2011.
2. Jiawei Han, MichelineKamber, “Data Mining Concepts and Techniques”, Elsevier, Reprinted Second Edition,2008.
3. Da Ruan,Guoqing Chen, Etienne E.Kerre, Geert Wets, “Intelligent Data Mining”, Springer,2007
4. Paul Zikopoulos,Dirk deRoos, Krishnan Parasuraman, Thomas Deutsch , James Giles , David Corrigan, Harness, “The Power of Big Data the IBM Big Data Platform”, Tata McGraw Hill Publications, 2012
5. Michael Minelli, Michele Chambers, AmbigaDhiraj, “Big Data, Big Analytics Emerging Business Intelligence and Analytic Trends for Today's Businesses”,Wiley Publications,2013 .
6. Zikopoulos, Paul, Chris Eaton, “Understanding Big Data Analytics for Enterprise Class Hadoop and Streaming Data”, Tata McGraw Hill Publications, 2011.

Syllabus of Generic Elective Courses

15MCA151

SOFT SKILL – I

2 0 0 2

Course Objective

To help the students understand interpersonal skills, to support them in building interpersonal skills, to better the ability to work with others.

UNIT I PRONUNCIATION

6

1. An Introduction to Phonetics
2. Sounds – Vowel Sounds, Consonant Sounds and Diphthongs
3. Speaking with the right pronunciation
4. Regional Slant and how to overcome the slant
5. Standard Pronunciation and Received Pronunciation (R.P.)
6. Correcting common errors of pronunciation

DRILL IN LANGUAGE LAB

UNIT II SPEAKING

6

Learning to talk

Different attitude–different concept–different orientation according to the situation, aim and talk

1. Familiar Topics
2. Brain – storming, just a minute
3. Thinking Together
4. Finding the right word, Expressions, Usage, Mannerisms, Postures, Body–Language, Eye–Contact, Gestures.
5. Presenting points
6. Overcoming hesitations, Shyness and Nervousness
[From a word to a sentence and then to a short speech]
7. Speech – Rhythm
 - Rising and falling Tone
 - Accent
 - Intonation
 - Word stress, Syllable Stress and Sentence Stress.

UNIT III DRILLING IN THE LANGUAGE LAB

6

8. Preparing a speech on a given Subject
9. Pattern of a speech to suit the audience
–addressing the audience, slowly introducing the topic, defining the topic, points 1,2,3,...and if there is a draw-back mention it, Conclusion ‘Thank You’.
10. Choose the right word for right meaning– expression to suit the thought
11. Words – Derivatives, synonyms & Antonyms

DRILLING WITH DIFFERENT TOPICS FROM FAMILIAR TO UNFAMILIAR

UNIT IV WRITING SKILLS[creative Writing]

6

I Narration and Story – Telling

- 1) Narrating an incident, Coherence and Readability
- 2) Choosing the Tense
- 3) Plan of a story [Introducing the story, characters, incidents and proper end]

DRILL IN LANGUAGE LAB

II Reports

- 1) Agenda of a meeting
- 2) Circulars & Internal Memos
- 3) Reports of Meetings
- 4) Reports of Experiments
- 5) Business Report
- 6) Reporting for the media
- 7) Writing Press Reports
- 8) Conflict resolution – Adopting an agreed resolution

UNIT V READING [READING TO UNDERSTAND]

6

- 1) Reading with pauses
- 2) Reading with Intonation
- 3) Reading in a classroom
- 4) Reading to an assembly of Business men / Scientists
- 5) Quoting
- 6) Slogans in the reading material
- 7) Training for a News Reader/Corporate Spokesperson

Function of Commonly used Tenses

The function of the Parts of Speech in daily use in the corporate world

TOTAL: 30 HOURS

References:

www.tatamcgrawhill.com
www.dictionary.cambridge.org
www.wordsmith.org

15MCA152**SOFT SKILL – II****2002****Course Objective**

To help the students understand Speaking skills, to support them in building communication skills, to better the ability to work with others.

UNIT I SPEAKING**6**

- 1) Speaking at an Interview – “Interviews”
- 2) Meeting People
- 3) Exchanging Greetings
- 4) Introducing Oneself
- 5) Introducing people to others
- 6) Debates and Group Discussions
- 7) At the Interview for a Job

DRILL IN LANGUAGE LAB**UNIT II TELEPHONE CONVERSATION****6**

- 1) Etiquette & Manners
- 2) Answering the Telephone
- 3) Asking for someone
- 4) Taking and leaving messages
- 5) Making Enquiries

DRILL IN LANGUAGE LAB**UNIT III PRESENTATION****6**

- 1) Presenting a matter for discussion
- 2) Presenting a problem for Support
- 3) Presenting a product among customers and inventors
- 4) Slogans for advertising
- 5) Proverbs Re-defined
- 6) Saying ‘No’ without saying ‘No’
- 7) Presenting a paper at a seminar/conference

DRILLING IN PRESENTATION [EXERCISES]**UNIT IV WRITING SKILLS****6**

- Self-Motivation
- Leadership Qualities
- Be Innovative and Original / Creativity

5) The Impact of appearance

- Essentials of a good appearance
- Cleanliness and morals
- Importance of dress
- Overcome shyness / fear and Anxiety
- positive thinking
- career planning
- Etiquette & Manners
- Speech
- Character
- Integrity
- Wisdom
- Courage

6) Interpersonal Skills

- Team work
- Concept of leadership
- The Virtues of a Leader
- Decision making
- Time Management

Text Books:

- Newspapers and Magazines
- Write to Communicate – Geetha Nagaraj
- Spoken English – “A Self Learning Guide to Conversation Practice”, 34th Reprint, Tata McGraw Hill–New Delhi.
- Powell, In Company – Macmillan
- Personality Development – Elizabeth B. Hurlock

TOTAL: 30 HOURS

References:

www.tatamcgrawhill.com
 www.dictionary.cambridge.org
 www.wordsmith.org

15GPD251

PERSONALITY DEVELOPMENT – I

2002

UNIT I SOFT SKILLS

4

Introduction to Personality Development – Importance of Soft skills – Soft Skills for work place – First Impression – General Appearance – Posture – Cleanliness – Confidence and its usage.

UNIT II SOFT SKILLS II

4

Grooming – Attire – Attitude – Stability & Maturity Development – Strength & Weakness/ Goal Settings – Kinesis – Motivation & Self-Motivation

TOTAL: 30 HOURS

15GPD252

PERSONALITY DEVELOPMENT – II

2 00 2

UNIT I Life Skills

4

Basic etiquette – Email etiquette – Business etiquette – Telephone etiquette – Meeting etiquette – Adjustment of Role & Leadership – Team Management & Development.

UNIT II Life Skills II

4

Stress Management – Time Management – Event Management – Change Management – Seminars & Conference organizing – Conflict Resolution – The Art of Delegating Effectively – Enhancing Personal Effectiveness.

TOTAL: 30 HOURS