COURSE SPECIFICATION

Choice based Credit System (CBCS)
Scheme and course structure for
Masters in Information Technology 1st semester effective from academic session 2018 and onwards

Course Code	Name of the Subject	Paper Category	Hours/Week			Credits
			L	**T**	**P**	
IT18101CR	Database Systems	Core	3	0	2	4
IT18102CR	Open Source Technologies	Core	3	0	2	4
IT18103CR	Programming with C/C++	Core	3	0	2	4
IT18104CR	Fundamentals of Multimedia	Core	2	0	0	2
Discipline Centric Elective (8 credits)						
IT18105DCE	Advanced Computer Architecture	Elective (DCE)	3	1	0	4
IT18106DCE	Data Communications	Elective (DCE)	3	1	0	4
IT18107DCE	Numerical and Statistical Computing	Elective (DCE)	3	1	0	4
IT18108OE	Fundamentals of Information Technology	Elective (OE)	2	0	0	2
Total Credits						**24**

Scheme and course structure for
Masters in Information Technology 2nd semester effective from academic session 2018 and onwards

Course Code	Name of the Subject	Paper Category	Hours/Week			Credits
			L	**T**	**P**	
IT18201CR	Java Programming	Core	3	0	2	4
IT18202CR	Data structure using C/C++	Core	3	0	2	4
IT18203CR	Operating Systems	Core	3	1	0	4
IT18204CR	Cloud Computing	Core	2	0	0	2
Discipline Centric Elective (8 credits)						
IT18205DCE	Software Engineering	Elective (DCE)	3	1	0	4
IT18206DCE	Wireless Communications	Elective (DCE)	3	1	0	4
IT18207DCE	System Programming	Elective (DCE)	3	1	0	4
IT18208OE	Fundamentals of Network & Internet	Elective (OE)	2	0	0	2
Total Credits						**24**

Choice based Credit System (CBCS)
Scheme and course structure for
Masters in Information Technology 3rd semester effective from academic session 2018 and onwards

Course Code	Name of the Subject	Paper Category	L	T	P	Credits
IT18301CR	Design and Analysis of Algorithms	Core	3	0	2	4
IT18302CR	Python Programming	Core	3	0	2	4
IT18303CR	Dot Net Technologies	Core	3	0	2	4
IT18304CR	Pervasive Computing	Core	2	0	0	2
Discipline Centric Elective (8 credits)						
IT18305DCE	Discrete Mathematics	Elective (DCE)	3	1	0	4
IT18306DCE	Object Oriented Analysis and Design	Elective (DCE)	3	1	0	4
IT18307DCE	Computer Graphics	Elective (DCE)	3	1	0	4
IT18308OE	Project Management	Elective (GE)	2	0	0	2
Total Credits						**24**

Choice based Credit System (CBCS)
Scheme and course structure for
Masters in Information Technology 4th semester effective from academic session 2018 and onwards

Course Code	Name of the Subject	Paper Category	L	T	P	Credits
IT18401CR	Project	Core	0	0	16	8
IT18402CR	Software project/Demo/Dissertation	Core	0	4	0	4
IT18403CR	Internet of Things (IoT)	Core	2	0	0	2
Discipline Centric Elective (8 credits)						
IT18405DCE	Data Warehouse	Elective (DCE)	3	1	0	4
IT18406DCE	Finite Automata and Formal Languages	Elective (DCE)	3	1	0	4
IT18407DCE	Machine Learning	Elective (DCE)	3	1	0	4
IT18408OE	Management Information Systems (MIS)	Elective (OE)	2	0	0	2
Total Credits						**24**

1st Semester

Course Code: IT18101CR
Course Title: Database Systems

Unit I

Database System Applications, Purpose of Database Systems, View of Data, Database Languages, Relational Databases, Database Architecture, Data Mining and Information Retrieval, Database Models and Comparison, Relation Algebra, ER Model, CODDS Rules, Normalization..

Unit II

Introduction to SQL, Data Types, Data Definition Language, Data Manipulation Language, Transaction Control Language, Integrity Constraints, SQL Functions, Set Operators and Joins, View, Synonym and Index, Sub Queries and Database Objects, Locks and SQL Formatting Commands.

Unit III

Introduction to PLSQL, Architecture, Data Types, Control Structures, Concept of Error Handling, Cursors and Database Triggers, Subprograms and Packages.

Unit IV

Data Storage and Querying using various storage structures, Indexing and Hashing, Query Processing and Optimization. Transaction Management Concepts, Concurrency Control and Recovery.

Reference Books:
William Page,"Using Oracle 9i – Special Edition", Que/PHI.

Database System Concepts by A. Silbershatz, H.F. Korth and S. Sudarshan, 6th edition, 1997, McGraw-Hill, International Edition.
Ivan Bayross, "SQL & PL/SQL Using Oracle 8i & 9i with SQLJ", BPB.

Desai.B , "An introduction to Database Concepts", Galgotia Publications, N.Delhi
Dates.C , " An introduction to Database Systems", Pearson Education, Asia

Course Code: IT18102CR
Course Title: Open Source Technologies

Unit I

Introduction to Linux, History, Difference Between Linux and Windows., Difference Between Linux and Unix, Linux is Virus proof, Various Linux Distributions, Pros and Cons Understanding Files and Directories in Linux - File Structure and hierarchy, File Permissions, root, shell, Using VI editor and command associated with it.Basic Commands –mkdir, touch, ls, pwd, cd, chmod, df, du, dd, adduser, passwd, rm, rmdir, date.

Unit II

Introduction to PHP- History of web programming; how PHP fits into the web environment; installation and configuration, syntax, variables, operators, flow control structures

More language basics; using GET and POST input, working with HTML, forms; built-in and user-defined functions; variable scope; using the PHP manual, getting help

Unit III

Input validation, string manipulation and regular expression functions; date and time functions, code re-use, require(), include(), and the include_path; filesystem functions and file input and output; file uploads; error handling and logging; sending mail, HTTP headers and output control functions; HTTP cookies; maintaining, state with HTTP sessions; writing simple web clients

Unit IV

Introducing MySQL; database design concepts; the Structured Query, Language (SQL); communicating with a MySQL backend via the PHP, MySQL API;

References

1. N. B. Venkateshwarlu (Ed); Introduction to Linux: Installation and Programming, B S Publishers; 2005.

2. Matt Welsh, Matthias KalleDalheimer, Terry Dawson, and Lar Kaufman, Running Linux, Fourth Edition, O'Reilly Publishers, 2002

3. Programming PHP. RasmusLerdorf, Kevin Tatroe., (O'Reilly, ISBN 1565926102)

4. Learning PHP 5. David Sklar, (O'Reilly, ISBN 0596005601)

5. Core PHP Programming. Leon Atkinson, (Prentice Hall, ISBN 0130463469)

Course Code: IT18103CR
Course Title: Programming with C / C++

Unit I

Arrays: Declaration; initialization; 2-dimensional and 3-dimensional array, passing array to function, strings and string functions, and character arrays. Pointers: variables, swapping data, swapping address v/s data, misuse of address operators, pointers and arrays , pointers to pointers , strings , pointer arithmetic, additional operators , portability, pointers to functions, using pointers with arrays , void pointers .Structures and unions: syntax and use, members, structures as function arguments, structure pointers, array of structures as arguments, passing array of structure members, call by reference.

Unit II:

Functions; prototype, passing parameters, storage classes, identifier visibility, Recursive functions. Command-line arguments. Scope rules, Multi-file programming, Introduction to macros. File processing in C and C++. Introduction to graphics, graphic initialization, graphic modes, drivers, basic drawing functions, Animations- concept and implementation, Building graphical user interface.

Unit III

Introduction to classes and objects; Constructor; destructor; Operator overloading; Function overloading; function overriding; friend function; copy constructor; Inheritance: Single , Multiple, and Multilevel Inheritance; Virtual function and Polymorphism: Dynamic binding, Static binding; Virtual functions; Pure virtual function; concrete implementation of virtual functions; Dynamic binding call mechanism; Implementation of polymorphism;
Templates: Function Templates, Class Templates, Member Function Template and Template Arguments, Exception Handling, Standard Template Library

Reference Books:
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1. FOSTER AND FOSTER "C by discovery" RRI penram.
2. YASHWANT KANETKAR "Let us C" PHI.
3. E. BALAGURUSWAMI "Programming in ANSI C" Tata McGraw Hill.
4. BJARNE STROUSTRUP "The C++ programming language" Pearson Education.
5. HERBERT SCHILD "C++ The complete Reference" Tata McGraw Hill.
6. ROBERT LAFORE "Object orientation with C++ Programming" Waite Group.

Course Code: IT18104CR
Course Title: Fundamentals of Multimedia

UNIT I

Introduction to Multimedia. Definition, Components of multimedia, Multimedia Past and Present; History, Hypermedia, WWW and Internet, Multimedia Today. Users of multimedia, Applications of Multimedia; Education and Training, Entertainment and Art Industry, Engineering, Research, Communication, Medicine, Marketing and Advertising, Journalism, Sports, Gaming.
Graphics and Images: Image Properties; Resolution, Bit Depth, Color, Aspect Ratio, Dpi , Pixels. Popular Image File Formats: JPEG, GIF,PNG, TIFF. Basics of Image Capture.

UNIT II

A Multimedia System. Features of a Multimedia System, Multimedia PC workstation components; Input Devices / Capture devices, Storage Devices, Communication Ports, Output / Display Devices. Graphics Processor (Internal and external). Examples of Various Multimedia Systems.

UNIT III

Multimedia Configuration: Converging technologies, Functions & subsystems (input, development & output). Multimedia Development Tools: Presentation Tools, Authoring Tools and relevant Examples. Data Compression.
Multimedia Video: Frame Rate, Display; interlaced vs Non-interlaced. Video File Formats: MPEG, AVI. Multimedia Audio: Digital and Analog, Some Audio File Formats. Animation Basics.

References:

1. Fundamentals of Multimedia Ze-Nian Li, Mark S.Drew, Jiangchuan Liu, 2nd Edition (Pearson)

2. Multimedia in Practice Judith Jeffcote (PHI).

Course Code: IT18105DCE
Course Title: Advanced Computer Architecture

Unit I

Computer Architecture & Organization. Basic Parallel Processing Architecture, Taxonomy-SISD. MISD, SIMD, MIMD structures, Serial, Parallel & Concurrent Computation, CISC Vs RISC, Structure of Instruction of instruction sets and Desirable Attributes.

Unit II

Basic Concepts of pipelining, Instruction Pipelining. Hazards, Reservation Tables, Collision, Latency, Dynamic pipeline, Vector processing & Vector processors. Cache Memory & Virtual Memory: Structure, Analysis & Design. I/O Systems: Design Issues, Performances Measures. Loosely Coupled & Tightly Coupled Systems, Concurrency & Synchronization, Scalability, Models of Consistency, Application of

Unit III

SIMD Structure- Definition.Types of Interconnected Networks; Baselines, Shuffle-Exchange, Omega, Cuba, Comparison & Application. Mapping Algorithm to array structures, Systolic processors.Mapping design & Optimization, Wave Front Array processor.

Unit IV

Data Flow Graphs, Petri nets, Static & Dynamic DFA. Different Models, Languages, Compilers, dependency Analysis. Message Passing, Program mapping to Multiprocessors, Synchronization

References:

1. A Quantitative Approach by David A. Patterson, John L. Hennessy, David Goldberg

2. 2nd Edition Hardcover, 760 pages Morgan Kaufman Publishers Publication date: January 1996

3. A Hardware/Software Approach David Culler and J.P. Singh with Anoop Gupta

4. Solutions to Selected Exercises in Computer Architecture a Quantitative Approach by Thomas E. Willis, Allan D. Knies, Paperback Published by Morgan Kaufman Publishers Publication date: October 1996 ISBN: 1558604065

5. High-performance Computer Architecture (3rd edition), by Harold Stone ,Addison Wesley.

6. Computer Architecture: Pipelined and Parallel Processor Design by Michael J Flynn. Jones and Bartlett Publishers, 1995..

Course Code: IT18106DCE
Course Title: Data Communications

Unit I

Bandwidth and Channel Capacity. Quantifying Channel Capacity for noiseless channel(Nyquist Law) and noisy channel(Shannon's Law). Example of a digital telephone system to explain basic concepts of analog signals, digital signals, sampling. Data Rate versus Baud Rate. Nyquist Criterion for Sampling. Data transmission concepts. Characteristics of signals(amplitude, frequency, period, wavelength, Signal-to-Noise ratio). Key components in data communications systems. Simplified model. Local area network(LAN) concepts and characteristics.

Unit II

Wide area networks(WANs). WAN technologies (traditional packet and circuit switching, Frame Relay, ATM).ISDN(narrowband) concepts and services. Overview of the OSI model. Transmission media – factors affecting distance and data rate. Guided transmission media: Twisted-Pair, Co-axial Cable. Principles and advantages of optical networks. Types of optical fibers and lasers.

Unit III

Unguided transmission media: Terrestrial Microwave & Satellite Microwave systems and applications. Data encoding. Difference between modulation and encoding. NRZ-L, NRZ-I encoding. Multilevel Binary and Biphase Coding techniques and their implementations. ASK,FSK,PSK and QPSK. PCM concepts: sampling, quantization. Delta Modulation. Amplitude Modulation.

Unit IV

Reliable transmission of data: Asynchronous and Synchronous transmission. Error detection: Parity-based, CRC-based. FCS computation. Error control and recovery techniques. Concept of ARQ standard and its versions. Concept of Multiplexing. FDM. Synchronous and Statistical TDM.

Reference Books:
1. William Stallings, "Data and Computer Communications", Pearson Education
2. Andrew Tanenbaum, "Computer Networks", Pearson Education 4/e.
3. Ulysses Black, "Principles of Data Communications ", PHI.
4. Morley, Gelber, "The Emerging Digital Future", Addison-Wesley.

Course Code: IT18107DCE
Course Title: Numerical and statistical Computing

UNIT I

Introduction. Requirements for computer-oriented solutions to numerical problems. Approximations & Errors – Types of Programming Errors, Computer & Arithmetic Errors, Accuracy and Precision, Round off and Truncation Errors. Propagation of Error. Algorithms to Compute Roots of Equation – Methods of Tabulation or Brute Force Method, Method of Bisection, Secant Method, Newton-Raphson Method, Method for False Position. Implementations of these methods.
Algorithms to Solve Linear Algebraic Equations: Gauss Elimination, Gauss Jordan, Gauss Seidel, L.U. Decomposition,

UNIT II

Lagrange Interpolated Polynomial, Newton Divided Differences Interpolating Polynomial. Implementation of these methods.
Algorithms to solve Ordinary Differential Equations – Euler Method and Modification. The trapezoidal Rule, Simpson's Rule. R-K Method. Implementation of these methods.

UNIT III

Standard Deviation, Correlation, Regression Analysis, Algorithms for Curve Fitting straight line: Least Square Approximation. Concept of Hypothesis, Statistical Tests: Chi-Square Test, Student t-Test, f-Test.

REFERENCE BOOKS:

1. S.C.Chapra & R.P.Canale: "Numerical methods for Engineering". Tata McGraw Hill.

2. Krishenmurty and Sen : "Numerical Algorithms"

3. V. Rajaraman "Computer oriented numerical methods." Prentice Hall of India.

4. McCalla, Thomas Richard: "Introduction to Numerical Methods and FORTRAN Programming", John Wiley & Sons, Inc.

5. Grewal, B. S.: "Higher Engineering Mathematics", Hindustan Offset Problems Series.

6. "SCHAUM'S Solved Problems Series".

7. Sharma, K. D.:"Programming in Fortran".

8. Jain, M. K., Iyengav, S. R. K., Jain, R. K.: "Numerical Methods for Scientific and Engineering Computation"+, Wiley Eastern Ltd, New Delhi

Course Code: IT18108OE
Course Title: Fundamentals of Information Technology

UNIT 1:

Introduction to Information Technology: Basic concepts of IT, Data Processing: Data and Information. Introduction to Computers: Classification, History, Types of Computers; Mini Computers, Micro Computers, Mainframe Computers, Super Computers. Applications of Information Technology:
Block Diagram of The Computer System, Introduction to various units. Hardware: CPU, Memory, Input and Output devices, Auxiliary storage devices. Software: System and Application Software, Utility packages, Configuration of Computer System . Types of Memory RAM, ROM, PROM, EPROM. Secondary Storage Devices (FD, CD, HD, Pen drive). I/O Devices: Scanners Digitizers Plotters, LCD, Plasma Display etc.

UNIT II

CPU type and speed; memory: capacity, type, word size, speed. Hard drive: capacity, speed; fire wire, expansion slots, ports. Number System. Binary, octal and hexadecimal number systems; binary addition and subtraction. Integers (positive and negative): sign and magnitude,
BCD, two's complement; representation of characters, ASCII.
Operating System: History, evolution and structures, Introduction to MS-DOS/WINDOWS/LINUX/UNIX. Data Organization: Drives, Files, Directories. Translators: Assembler, Compiler and Interpreter.

Recomended Books:

1. Raja Raman V., "Fundamental of Computers" (4th edition.), Prentice Hall of India, New Delhi.
2. Trainer T., et al, "Computers", McGraw Hill.
3. Norton, Peter, "Introduction to Computers, Mc-Graw-Hill.
4. S.Jaiswal, "Fundamental of Computer & IT", Wiley dreamtech India.

2nd Semester

Course No: IT18201CR
Course Title: Java Programming

Unit I

Features of Java, OOPs concepts, Java virtual machine, Reflection byte codes , Byte code interpretation, Data types, variable, arrays, expressions, operators, and control structures Objects and classes Abstract classes, Static classes, Inner classes, Packages, Wrapper classes , Interfaces, This, Super Access control.

Unit II

Exception handling - Exception as objects , Exception hierarchy, Try catch finally, Throw, throws IO package - Input streams, Output streams, Object serialization, Deserialization, Sample programs on IO files, Filter and pipe streams Multi threading - Thread Life cycle, Multi threading advantages and issues , Simple thread program Thread synchronization

Unit III

JDBC architecture, Establishing connectivity and working with connection interface, Working with statements, Creating and executing SQL statements , Working with ResultSet

Unit IV

Overview of JSP, JSP Architecture & life cycle, Components of Java Server Pages, Implicit Objects & Standard JSP Tags, Scope of JSP objects, EJB overview & Architecture, Features of EJB , Developing Web Application with MySQL Database by implementing EJB

References:

1. Programming with Java A Primer, E.Balaguruswamy Tata McGraw Hill Companies

2. Java Programming John P. Flynt Thomson 2nd

3. Java Programming Language Ken Arnold Pearson

4. The complete reference JAVA2, Herbert schildt. TMH

5. Big Java, Cay Horstmann 2nd edition, Wiley India Edition

6. Core Java, Dietel and Dietel

7. Java – Balaguruswamy

8. Java server programming, Ivan Bayross SPD

Course Code: IT18202CR
Course Title: Data Structures using C/C++

Unit I

Introduction: Structure and problem solving, Primitive Data Structures: Operation On primitive Data Structures, Recursion Function and its examples.

String Manipulation, String Matching Techniques &Applications (examples: Text Editing, Lexical Analysis).

Unit II

Concept of Stack and Queue.Singly and Doubly-Linked Lists, Circular Linked List, their implementation and comparison. Array based and Linked List based Implementation of stack and Queues and their applications.

Unit III

Searching: Sequential and Binary Search on Array-based ordered lists. Binary Trees, their implementation and traversal. Binary Search Trees: Searching, Insertion and Deletion of nodes. Height Balance and Concept of AVL Trees. Concept and purpose of B-Trees.

Unit IV

Concept of Hash Functions, Hash-tables and Hashing with Chaining. Sorting Techniques: Insertion Sort, Selection Sort, Quick Sort, Heap Sort. External Sorting: k-Way Merge Strategy. File Structure: Sequential Files, Indexed Files, Direct Files.

TEXT BOOKS

1. Trebley and Sorenson: "An Introduction to Data Structures with Applications" McGraw Hill, Kongakusha 1976.

2. Horowitz and Sahni: "Data Structures" SBCS Publication, 1980.

3. Michael J.Folk et al "File Structure an Object Oriented Approach with C++.

4. Data Structures Using C – Aaron Tenenbaum

REFERENCE BOOKS:

1. Fundamentals of data structures – Ellis Horowitz and SartajSahni

2. Data Structures Files and Algorithms – Abhay K. Abhyankar

3. Data Structures and Algorithms – Alfred V. Aho, John E. Hopcroft,Jeffrey D. Ullman (Pearson Education)

Course Code: IT18203CR
Course Title: Operating Systems

Unit I

Overview Of An Operating System, Resource Management, Operating System Interface, Process Management Concepts, Inter-Process Communication, Process Scheduling, Synchronization, Deadlocks. Case Studies Unix/Linux,windows

Unit II

Memory Management, Linking, Loading, Memory Allocation, Design Issues and Problems, Virtual Memory, Fragmentation, Implementing Virtual Memory, Paging, Segmentation, Virtual Memory Design Techniques, Buffering Techniques, Spooling. Case Studies Unix/Linux, windows.

Unit III

File Management - File Systems & I/O. Device Drivers, Access Strategies, File Systems, File System Organization, Design Techniques. Multiprocessor Systems, Types of Multiprocessor Operating Systems, Design and Implementation Issues. Case Studies Unix/Linux, windows.

REFERENCE BOOKS:

1. Dietel, H.M. "An introduction to operating system" Pearson Education, 2/e.

2. Milenkovic.M. "An Operating System – Concepts &Design".McGraw Hill International Education Computer science series 1992.

3. Peterson. J.L.AbharamSilberschatz. "Operating System Concepts". John wiley ,1989.

4. Tananbum, A. S. "Modern Operating System", Pearson Education.

5. Karnetkar, "Unix Shell Programming", BPB.

Course Code: IT18204DCE
Course Title: Fundamentals of Grid and Cloud Computing

UNIT I

FUNDAMENTALS OF GRID COMPUTING The Grid – Past, Present and Future – Applications of Grid Computing Organizations and their Roles.

GRID COMPUTING ARCHITECTURE Grid Computing Anatomy – Next Generation of Grid Computing Initiatives – Merging the Grid Services Architecture with Web Services Architecture.

GRID COMPUTING TECHNOLOGIES

OGSA – Sample Use Cases that drive OGSA Platform Components – OGSI and WSRF – OGSA Basic Services – Security Standards for Grid Computing – High Level Grid Services.

UNIT II

FUNDAMENTALS OF CLOUD COMPUTING

Fundamentals – Shot history of cloud computing – Cloud Architecture – Cloud Storage – Cloud Service – Pros and Cons of cloud computing – Benefits from cloud computing.

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UNIT III

CLOUD SERVICES

Need for Web-Based Application – The cloud Service Development – Cloud Service, Development Types – Cloud Service development tools.

TEXT BOOKS

1. Joshy Joseph & Craig Fellenstein, "Grid Computing", Pearson Education, 2004.

2. Michael Miller, "Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online", Que, 2008.

REFERENCES

1. Fran Berman, Geoffrey Fox, J.G. Anthony Hey, "Grid Computing : Making the Global Infrastructure a reality", John Wiley & sons, 2003.

2. Hmar Abbas, "Grid Computing: A Practical Guide to technology and Application Charles River media, 2003.

Course Code: IT18205DCE
Course Title: Software Engineering

Unit I

Introduction: Software engineering, Evolving role of software, Concept of software, Changing nature of software, Software Myths, Software Importance, Characteristics, Software Components, Software crises, Software Engineering Challenges (Scale, Quality Productivity, Consistency and Repeatability, Change), Software standard, Software Engineering approach.

Software Process Management: Software process, phase's framework, capability maturity model integration (CMMI), Process patterns, process assessment, personal and team process models (PSP, TSP) process technology, characteristics of software process

Unit II

Introduction to software process models waterfall, incremental process models, Evolutionary process model. Process Planning, Estimation, COCOMO Model, Project Scheduling and staffing Risk management (concepts, Risk assessment, and Risk control)

Introduction to Software Requirement Analysis and Specification: software requirement, (need for SRS requirement process), problem analysis (informal approach, data flow modeling, object –Oriented modeling, prototyping), requirement specification (characteristics, components), Concept of Use Cases, Concept of validation.

Unit III

Design Engineering: Function oriented design, Design principles, Coupling and Cohesion, Design Notations & Specifications, Structured Design Methodology; Object-Oriented Design, OO Concepts, Design Concepts, Design Methodology (Dynamic & Functional Modeling), Design Verification.

CASE (Computer Aided Software Engineering): Concept, scope, CASE Support in Software Life Cycle, Documentation, Project management.

References:

1. ROGER S. PRESSMAN - Software Engineering - A Practitioner's Approach, Sixth edition,

2. PankajJalote - An Integrated approach to Software Engineering, 3rd edition, Narosa Publication.

3. Sommmerville - Software Engineering. Pearson , 7/e , 2006. SCHAUM'S Outlines, TMH.

4. JAMES F. PETERS Software

Course Code: IT18206DCE
Course Title: Wireless Communications

Unit I

Classification and types of Wireless telephones. Introduction to Cordless, Fixed Wireless(WLL), Wireless with limited mobility(WLL-M) and (Fully)Mobile Wireless phones. Introduction to various generations of mobile phone technologies and future trends.Wireline vs. Wireless portion of mobile communication networks. Mobile-Originated vs. Mobile-Terminated calls. Mobile-Phone numbers vs. Fixed-Phone numbers; Billing Issues.

Unit II

Electromagnetic spectrum, its use and allocation to well-known bands. Concept of cells, sectorization, coverage area, frequency reuse, cellular networks & handoffs.
Wireless Transmission concepts; types of antennas, signal propagation, multipath propagation.Comparison of FDM, TDM and CDM techniques. Basic concepts of Spread Spectrum(SS) technique; Direct Sequence SS versus Frequency Hopping SS.

Unit III

Simplified implementation of IS-95 CDMA using chip sequences. Concept of CDMA(PCS& Cellular) channel; Forward and Reverse CDMA channel for a cell/sector. Concept of(Walsh)Code Channels within a CDMA Channel. Purpose of Pilot, Sync, Paging, Forward Traffic Channels.Purpose of Access & Reverse TCs. Comparison of Cellular and PCS CDMA networks; frequencies and cell-sizes. Advantages/Disadvantages of smaller cell size. Concept of Voice Coding . Components of Mobile Network Infrastructure: MS, BTS, BSC, MSC; their basic functions and characteristics. Types of handoffs in GSM.Use of HLR and VLR in mobile networks.

References Books:
1. Andy Dornan, "The Essential Guide to Wireless Communications Applications", Pearson.

2. Jochen Schiller, "Mobile Communications", Pearson.

3. K.Pahlavan, P.Krishnamurthy, "Principles of Wireless Networks", Pearson Education.

4. Andrew Tanenbaum, " Computer Networks(4th Edition)", Pearson Education.

5. T. Rappaport, "Wireless Communications, Principles and Practice (2nddEition). Pearson Education

Course Code: IT18207GE
Course Title: System Programming

Unit I

Introduction, Machine Structure , Evolution of the Components of programming system Evolution of Operating Systems, General Machine Structure , General Approach to a New Machine , Machine Structure 360-370, Machine Language. Assembly Language

Unit II

General Design Procedure, Assemblers, Design of a single pass assembler and multi pass assembler, Macros: two pass algorithm, single pass algorithm, Implementation of macro calls within macros.
Loaders and Linkers, Loader Schemes, subroutine linkages, relocating loaders, Linking loaders, Design of an absolute loader, Design of a direct linking loader.

Unit III

Formal Systems and Programming Languages: Formal specification, Hierarchy of Languages, BNF, Canonic Systems and Formal Systems.

Compilers, Statement of problem, phases of Compiler-Lexical phase, syntax phase Interpretation phase, optimization, storage assignment code generation and assembly phase, Passes of a compiler.

Text Book: John J. Donovan, "Systems Programming", Tata McGrawHill
Reference Books:
Leland L.Beck."System Software" 4th edition Pearson 1997
Barron.D.W."Assemblers and Loaders" Mc Donald and Javes 1978

Ullman.J.D."Fundamentals of Programming System" Addison and Wesley
D.M.Dhamdhere."System Programming and Operating Systems"2nd edition

Course Code: IT18208OE
Course Title: Fundamentals of Network and Internet

UNIT I

Definitions of data communication and network; communication modes: (simplex, duplex, half duplex), point-to-point, and broadcast. Analog & Digital signal, types of networks: (local area network, wide area network, metropolitan area network). A Data Communication Model and Examples.
Networking Devices: Repeaters, Hubs, Switches, Bridges, Routers, and Gateways. Network

UNIT II

Topologies; Bus, Star, Ring, Mesh, Tree and Hybrid. A Computer network diagram. Adressing: Logical and Physical. Concept of a Protocol. Programs and Processes, Protocol Layering Concepts, Encapsulation and De-capsulation. OSI and TCP/IP model Introduction. Transmission Medium. Types of transmission media: cable/wired media (coaxial, fibre-optic, twisted pair), wireless media (satellite, microwave, infra-red), wireless network technology: (Bluetooth, Wi-Fi), hotspot, modem, bandwidth. Concept of Internet and Intranet

UNIT III
Server, Client and The Client/Server Model. Mail server and Chat Server, HTTP, File Transfer Protocol (FTP), upload, download, World Wide Web (WWW), web browser, web page, website, blogging, Social Networking sites, URL, e-commerce, e-learning, , pod-casting, bulletin board, VoIP. Information Security Basics.

References:

1. "Data Communications and Networking Hardcover" Behrouz A. Forouza, McGraw Hill Education; 5 edition
2. AndrewTanenbaum, "Computer Networks", Pearson Education 4/e.

3rd Semester

Course Code: IT18301CR
Course Title: Design and Analysis of Algorithms

Unit I

Introduction to Algorithms, Analysis of algorithms, Designing Algorithms, Growth of Functions, Asymptotic notations, Recurrences , Substitution method , Iteration method, Recursion trees , The Master Method, Time and Space Complexity study of some basic algorithms.
Randomized Algorithms: Identifying the repeated element, Primality testing, Advantages and Disadvantages.

Unit II

Divide and Conquer, General method, Binary search, Quick sort. Greedy Method, General method, Knapsack problem, Single source shortest paths.

Unit III

Dynamic programming, General methods, All pair shortest paths, Traveling salesman problems. Backtracking, General method, 8-Queen problem, Sum of subsets, Knapsack problem. Branch and Bound, General method, Least Cost Branch and Bound, 8-Queen Problem, Traveling salesperson problem.

Unit IV

Lower boundary theory, Lower bound theory through reductions, P and NP problems. NP hard and NP complete problems. Approximate Algorithms and their need, the vertex Cover Problem, The traveling salesman problem, The subset sum problem.

Text Book:
2. Pearson Horowitz, Sahni, " Fundamentals of Computer Algorithms", Galgotia Publications
3. Goodrich and Tamassia " Algorithm design"

Reference Books:
1. Coremen, Leiserson, Rivest,Stein, "Introduction to Algorithms", 2nd edition, PHI.
2. Aho, Hopcroft and Ullman, "The Design and Analysis of Computer Algorithms", Pearson.

Course Code: IT18302CR
Course Title: Python Programming

Unit I

Introduction to Python Programming: Features, History and Present, interactive mode and script mode,installing python, basic syntax, Writing and executing simple program. Basic Data Types.

Declaring variables, Performing assignments; arithmetic, logical and relational operations, Comments, Simple input-output.Sequence Control – Precedence of operators, Type conversion

Conditional Statements: if, if-else, nested if –else Looping: for, while, nested loops. Control statements: Terminating loops, skipping specific conditions, use of compound expression in conditional and looping construct.

Unit II

String Manipulation: declaring strings, escape characters, string functions.

Lists: basics, list operators (joining, slicing, +, *, in , not in); inserting, replacing, and removing an element, searching and sorting list. List functions and methods: len( ), insert( ), append( ), extend( ), sort( ), remove( ), reverse( ), pop( ), list( ), count( ), extend( ), index( ), cmp( ), max( ), min( ). [**4L**]

Dictionaries: Basics, Concept of key-value pair, creating, initializing and accessing the elements in a dictionary, traversing, appending updating and deleting elements. Dictionary Functions and methods: cmp( ), len( ), clear( ), get( ), has_key( ), items( ), key( ), update( ), values( ), pop( ), from keys(), dict().

Tuples: Immutable concept, creating, initializing and accessing elements in a tuple, Tuple assignment, Tuple slices, Tuple indexing; Tuple Functions: cmp(), len(), max(), min(), tuple(), index(), count(), sum(), any(), all(), sorted(), reversed().

Unit III

Functions: Defining a function, calling a function, Advantages of functions, types of functions, function parameters, Formal parameters, Actual parameters, anonymous functions, global and local variables Modules: Importing module, Creating & exploring modules, Math module, Random module, Time module.

File Input-Output: Opening and closing file, Various types of file modes, reading and writing to files, manipulating directories Exception Handling: What is exception, Various keywords to handle exception such try, catch, except, else, finally, raise–Regular Expressions–Concept of regular expression, various types of regular expressions, using match function.

Unit IV

Database and Python: Connecting to MySQL, Insertion, Retrieval, Updation. Basic Database programming with Python. Introduction to Data Sciences and Tools: NumPy, Matplotlib, SciPy

Reference Books

1. Python in a Nutshell, 3rd Edition, A Desktop Quick Reference, *Alex Martelli, Anna Ravenscroft, Steve Holden,*O'Reilly Media, 2017
2. Python: A Step by Step for Beginners, *Tom Tiffel*
3. Beginning Programming with Python for Dummies *John Mueller*, Wiley
4. Python Crash Course: A Hands-On, Project-Based Introduction to Programming, *Eric Matthes*
5. Beginning Python: Using Python 2.6 and Python 3, *James Payne*, Wiley India, 2010.

Course Code: IT18303CR
Course Title: Dot NET Technologies

UNIT I

HTML - Concepts of Hypertext, Versions of HTML, Elements of HTML syntax, Head & Body Sections, Building HTML documents, Inserting texts, Images, Hyperlinks, Backgrounds and Colour controls, Different HTML tags, Table layout and presentation, Use of front size & Attributes List types and its tags, Use of Frames and Forms in web pages

Introduction to .NET Framework, .NET Architecture, CIL and JIT, Assemblies, Managed Code, Garbage Collection, MSIL and Metadata, CLR, CLI, CLS.

UNIT II

VB.NET Concepts: Flow Control, Type Conversions, Complex Variable Types, Arrays, Structs, String Manipulation. Functions, Debugging and Error Handling. Object Oriented Programming using C#, Collections, Comparisons and Conversions. Generics.

UNIT III:

Basic Windows Programming: Controls, Button, Label and Link Label, Text Box, Radio and Checkbox, RichTextBox, List and CheckBoxes, TreeView and ListView Controls, Tab Control. Menus and ToolBars, SDI and MDI Applications.

UNIT IV

ASP.NET Web Programming: Site Management (Client and Server Side), Styles, Master Pages, Site Navigation, Authentication and Authorization, Web Service. **Data Access:** Streams, XML, Connection and Command Objects, Data Reader, Data Adapter, Data Set.

Text Book : Professional VB.NET 2010 by Christian Nagel , Bill Evgen , Jay Glynn Wrox Publications , 2006.
Reference
1. Dietel&Dietel , "VB.NET , How to Program",Pearson Education.
2. Visual Basic.Net by John Sharp & John Jagger, PHI, New Delhi.
3. Visual Studio .Net by Francisco, Microsoft Publication.

Course Code: IT18304CR
Course Title: Pervasive Computing

Unit I

Technologies : Past, Present, Future , Pervasive Computing , The pervasive computing market, Device Technology : Hardware , Human-machine interfaces , Biometrics , Operating Systems , Java for Pervasive devices , Device Connectivity : Protocols , Security , Device Management , Web Application Concepts : History of World wide Web . World Wide Web Architecture, Protocols, Transcoding, Client Authentication via the Internet.
WAP : Introduction , Components of the WAP architecture , WAP infrastructure , WAP Security Issues , Wireless Markup Language , WAP push , Products , i-mode , Voice Technology :

Unit II

Wireless Markup Language , WAP push , Products , i-mode , Voice Technology : Basics of Speech Recognition , voice standards , speech applications , speech and pervasive computing, security, Personal Digital assistants : History , Device Categories , PDA Operating Systems , Device Characteristics , Software Components , Standards , Mobile Applications , PDA browsers.

Unit III

Architecture : Server Side Programming in Java : J2EE and overview , Servlets, Enterprise Java Beans , Java Server Pages , Extensible Markup Language , Web services , Model-View-Controller Pattern, Pervasive web application architecture : Background , scalability and availability ,
Smart Card-based authentication via the Internet, Ordering goods , Access via WAP : WAP functionality , Implementation , Access from Personal Digital Assistants: Extending the example application to personal digital assistants. Implementation for synchronized devices, for intermittently connected devices, for connected devices. Access via voice:

Reference Books :

1. JochenBurkhardt, Dr. Horst Henn , Stefan Hepper , Klaus Rintdorff, Thomas schack " Pervasive Computing " Technology and Architecture of Mobile Internet Applications , Pearson Education.

Course Code: IT18305DCE
Course Title: Discrete Mathematics

UNIT I
Proposition, Logic, Truth tables, Propositional Equivalence, Logical Equivalence, Predicates and Quantifiers, Sets: operations on sets, Computer representation of sets, Functions: Domain, Range, One-to-One, Onto, Inverses and Composition, Cardinality of a Set, sequences and summations, The growth of functions . Methods of Proof: Different methods of proof, Direct Proof, Indirect Proof, Mathematical Induction for proving algorithms.
Counting: Basic Counting Principle, The Pigeon-Hole Principle, Permutation, combinations, repetitions, discrete probability, Advanced Counting Techniques: Inclusion-Exclusion, Applications of inclusion-exclusion principle.

UNIT II
Recurrence relations, solving recurrence relation. Relations: Relations and their properties, Binary Relations, Equivalence relations, Diagraphs, Matrix representation of relations and digraphs, Computer representation of relations and digraphs, Transitive Closures, Warshall's Algorithm.
Partially Ordered Sets (Posets), External elements of partially ordered sets, Hasse diagram of partially ordered set, isomorphic ordered set, Lattices: Properties of Lattices, complemented Lattices.

UNIT III
Graph theory: Introduction to graphs, Graph Terminology Weighted graphs, Representing Graphs, Connectivity of Graphs: Paths and Circuits, Eularian and Hamiltonian Paths, Matrix representation of graphs. Graph Coloring.
Trees: Rooted trees, Application of trees: Binary Search Trees, Decision Trees, Prefix Codes, Tree traversal, trees and sorting, spanning trees, minimal spanning trees. Finite Boolean algebra, Functions on Boolean algebra, Boolean functions as Boolean polynomials. Groups and applications: Subgroups, Semigroups, Monoids, Product and quotients of algebraic structures, Isomorphism, Homomorphism

Text Book :
KENNETH H. ROSEN "Discrete Mathematics and Its Applications" The Random House/Birkhauser Mathematics series
Reference Books:
1. LIU "Elements of Discrete Mathematics " Tata McGraw Hill
2. SCHAUMS "Discrete Mathematics " Tata McGraw Hill
3. KOLMAN/REHMAN "Discrete Mathematical Structures " Pearson Education
4. NICODEMI "Discrete Mathematics " CBS

Course No: IT18306DCE
Course Title: Object Oriented Analysis & Design

Unit I

OOAD – Introduction , Applying UML and Patterns in OOAD , Assigning Responsibilities , What is analysis and Design , An Example , The UML , Iterative Development –an Unified Process idea , Additional UP Best Practices and Concepts , The UP Phases and Schedule oriented Terms , The UP disciplines. Process Customization and the development case. The Agile UP.The Sequential Waterfall Lifecycle. Inception. Artifacts that may start in inception, Understanding requirements, types of requirements.

Unit II

Use –case Model , Writing requirements in context , goals and stories , background , use cases and adding value , use cases and functional requirements , use case types and formats . Goal and scope of a use case , Finding primary actors , goals and use cases , writing use cases in an essential UI-free style , Actors , Use Case Diagrams , Use Cases within the UP , Case Study. Identifying other requirements. From inception to elaboration.
Use Case Model : Drawing System Sequence Diagrams. Example of an SSD. SSDs and Use Cases , System Events and the System Boundary , Name System Events and Operations , Showing Use Case Text , SSDs within the UP

Unit III

.Domain Model : Visualizing Concepts , Domain Models , Conceptual Class Identification , Candidate Conceptual classes , The UML association notation , NextGen POS Domain Model Associations , NextGen POS Domain Model , Adding Attributes , Non Primitive Data Type Classes , Adding Detail with Operation Contracts , Contract Sections , Post Conditions , Contracts , Operations and the UML. Operation Contracts within the UP.
From Requirements to Design , Interaction Diagram Notation , Sequence and Collaboration Diagrams , GRASP , Responsibilities and methods , interactions diagrams , Patterns , GRASP : Pattern of General Principles in Assigning Responsibilities , Information Expert , creator , Low Coupling , High Cohesion , Controller , Object Design and CRC Cards , Design Model : Use Case Realization with GRASP Patterns , Determining Visibility , Creating Design Class Diagrams , Mapping Design to Code

Reference Books:
1. James Rumbaugh, "Object Oriented Models and Design" Pearson Education 2/e
2. Ali Bahrani "Object Oriented Systems Development" McGraw -Hill 1999
3. Lafore Robert, "Object Oriented Programming in C++", Galgotia Publications.
4. Balagurusami, E, "Object Oriented with C++", Tata McGraw-Hill.
5. D. Ravichandran, "Programming with C++", McGraw-Hill Publications

Course Code: IT18307DCE
Course Title: Computer Graphics

Unit I

Introduction to Computer Graphics. Applications of Computer Graphics. Graphic Display Devices_ Raster, Refresh, Random. Display Buffer, Concept of Double Buffering and Segmentation of Display Buffer. Use of Lookup tables. OpenGL API.
2-D Graphics. Cartesian and Homogeneous Coordinate Systems. Line drawing algorithms (Bressenhams and DDA). Circle and Ellipse Drawing Algorithms. 2-Dimensional Transformations.Concepts of Window & Viewport, Window to Viewport Transformations. Filling, Boundary and Floodfill algorithms.

Unit II

Clipping, Line Clipping Algorithms (Cohen-Sutherland Algorithm), 3-D Graphics, Projections: perspective and parallel projection transformations. 3-Dimensional Transformations. Hidden Surface Removal Techniques, Z-Buffer Algorithm, Back Face Detection.

Unit III:

Curves and Surfaces, Splines, Spline specification, Interpolated & Approximated Splines. Bezier Splines, Bezier Curves, Cubic Bezier Curves, Bezier Surfaces. B-Splines curves and surfaces. Fractals - Fractal Generation Procedure.

Text Book : Hearn and Baker " Computer Graphics" 2nd Edition , Pearson Education.
Reference Books
1. W.M.Newman and Sproull. "Principles of interactive Computer Graphics" ,TMH
2.Steven Harrington." Computer Graphics a Programming Approach" McGraw Hill.
3. Plastock and Kelley. "Schaums outline of theory and problems of computer Graphics"
4. David F Frogers and J Alan Adams. "Procedural Elements of Computer Graphics" McGraw Hill
5. David F Rogers and J Alan Adams. "Mathematical Elements of Computer Graphics" McGraw Hill
6. James. D. Foley, A Vandam etal "Computer Graphics" Pearson.

Course Code: IT16308OE
Course Title: Project Management

UNIT I - INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT

Project Definition – Contract Management – Activities Covered By Software Project Management – Overview of Project Planning – Stepwise Project Planning. Strategic Assessment – Technical Assessment – Cost Benefit Analysis. Cash Flow, Forecasting.

Cost Benefit Evaluation Techniques – Risk Evaluation. Objectives – Project Schedule – Sequencing and Scheduling Activities –Network Planning Models – Forward Pass – Backward Pass – Activity Float – Shortening Project Duration – Activity on Arrow Networks.

UNIT II - PROJECT EVALUATION AND MONITORING

Risk Management – Nature Of Risk – Types Of Risk – Managing Risk – Hazard Identification – Hazard Analysis – Risk Planning And Control. Creating Framework – Collecting The Data – Visualizing Progress – Cost Monitoring – Earned Value – Prioritizing Monitoring – Getting Project Back To Target – Change Control.

Understanding Behavior Organizational Behavior: A Background –Selecting The Right Person For The Job – Instruction In The Best Methods – Motivation– The Old man – Hackman Job Characteristics Model – Working In Groups – Becoming A Team – Decision Making – Leadership – Organizational Structures.

TEXT BOOK:

1. Bob Hughes, Mikecotterell, "Software Project Management", Third Edition, Tata McGraw Hill, 2004. REFERENCES: 1. Ramesh, Gopalaswamy, "Managing Global Projects", Tata McGraw Hill, 2001.

2. Walker Royce, "Software Project Management - A Unified Framework", Pearson Education,2004.

3. Jalote, "Software Project Manangement in Practive", Pearson Education, 2002. 2. Humphrey Watts, "Managing the Software Process", Addison Wesley, 1989.

4th Semester

Course Title: Project Course Code: IT18401CR (8 Credits)

Course Title: Software projects/Demonstration/Dissertation

Course Code: IT18402CR (4 Credits)

Course Code: IT18403CR
Course Title: Internet of Things (IOT)

UNIT I

Introduction to IoT, Defining IoT, Characteristics of IoT, Physical design of IoT, Logical design of IoT, Functional blocks of IoT, Communication models & APIs

Brief History and evolution of IoT, Trends in the Adoption of IoT, Risks, Privacy, and Security

IoT & M2M Machine to Machine, Difference between IoT and M2M, Software define Network

UNIT II

Network & Communication aspects - Wireless medium access issues, MAC protocol survey, Survey routing protocols, Sensor deployment & Node discovery, Data aggregation & dissemination.

Challenges in IoT- Design challenges, Development challenges, Security challenges, Risks and Privacy challenges, Introduction to different IoT tools.

Reference Books:

1. Vijay Madisetti, ArshdeepBahga, "Internet of Things: A Hands-On Approach"

2. WaltenegusDargie,ChristianPoellabauer, "Fundamentals of Wireless Sensor Networks: Theory and Practice"

3. The Internet of Things: Enabling Technologies, Platforms, and Use Cases", by Pethuru Raj and Anupama C. Raman (CRC Press).

Course Code: IT18405DCE
Course Title: Data warehousing

Unit I

Data warehouse: Definitions, features, building blocks/ components, data marts, Meta data in data warehouse; planning a data warehouse, The project team, project management considerations, Business requirements; data design, the architectural plan, Data storage specifications, Information delivery strategy.

Unit II

Architecture and Infrastructure: Concept of data warehouse architecture, operational infrastructure, physical infrastructure, hardware and operating systems, database software, tools. The role of metadata, metadata types, metadata requirements. Principles of dimensional modeling: Dimensional modeling basics, Use of CASE tools, The STAR schema, The Snowflake Schema.

Unit III

Data Extraction, Data Transformation, Data Loading. Data Quality: Need, Data Quality Challenges, Data Quality Tools. Information access and delivery, Information delivery tools. Online Analytical Processing (OLAP): Features, functions, OLAP models, Implementation considerations, OLAP platforms, OLAP tools and products.

Unit IV

Introduction to Data Mining: definitions, Data mining techniques, applications. Physical Design in data warehouse: Steps, Physical Design considerations, Physical storage. RAID technology, estimating storage sizes, Indexing the data warehouse: B-Tree Index, Bitmapped Index, Clustered Index Performance Enhancement Techniques: Data Partitioning, Data Clustering, Parallel processing, data arrays.Data warehouse deployment.

Text Book:
PaulrajPooniah , " Data Warehousing Fundamentals " Wiley

Reference:
Alex Berson , Stephen J. Smith " Data Warehousing , Data Mining and OLAP , Tata McGraw Hill , 2004 Tenth reprint 2007.
Sam Anahory , Dennis Murray ," Data Warehousing in the real world " , Pearson Education.

Course Code: IT18406DCE
Course Title: Fine automata & Formal Languages

Unit I

Basic concepts of theory of computation: Formal Languages and Grammars, Finite State Transducers, Finite-State Automata and Regular Languages, Limitations of Finite-Memory Programs.
Recursive finite-domain programs, Recursion,

Unit II

Pushdown Transducers, Context-Free Languages, Limitations of Recursive Finite-Domain Programs
Turing Machines. Programs and Turing Transducers, Universal Turing Transducers, Undecidability.

Unit III

Introduction to resource-bounded computation, Time and Space, A Time Hierarchy, Nondeterministic Polynomial Time, some *NP*-Complete Problems

Text Book:

1. Hopcroft, J., and Ullman, J. (1979), "*Introduction to Automata Theory, Languages and Computation*", Pearson Education.
1. P. Linz, "*Introduction to Formal Languages and Automata*", 3rd edition, 2000, Jones and Barlett, PWS Publishing Company.

Suggested Readings:

1. Eiton Gurarri : *Introduction to Theory of computation*, Computer Science press

2. Hopcroft J, R. Motwani, and J. Ullman, "*Introduction to Automata Theory, Languages and Computation,* 3rd Ed. 2006, Pearson Education.

Course Code: IT18407DCE
Course Title: Machine Learning

Unit I
Introduction to learning. Types of Learning, Rote learning, Learning by parameter adjustment, Learning by general problem solving, Concept learning, Learning by analogy
Introduction to machine learning, Why machine learning. Types of problems in machine learning, History of machine learning, Aspects of inputs to training, Learning systems.
Supervised learning, unsupervised learning, Reinforcement learning etc.

Unit II
Classification Algorithms: KNN and effect of various distance algorithms (Euclidean, Manhattan, Mahalanobis Distances, etc.)
Decision tree learning algorithms: Introduction, Inference model, general domains, symbolic decision trees, consistency, learning trees from training examples, entropy, mutual information, ID3 algorithm.
Unit III
Support Vector Machines: Kernel functions, Linear SVM, Nonlinear SVM. Genetic algorithm, Regression analysis, Multivariable regression.
Clustering Algorithms: K-mean clustering, fuzzy K-means, hierarchical clustering.

Unit IV
Neural Networks. Artificial Neural Networks Basics, ANN - Learning Process, Types of Networks, Perceptron, Multilayer Perceptron, Error back Propagation Algorithm, RBF Networks.

References:
1. Kevin Murphy, Machine Learning: A Probabilistic Perspective, MIT Press.
2. Trevor Hastie, Robert Tibshirani, Jerome Friedman, The Elements of Statistical Learning, Springer.
3. Christopher Bishop, Pattern Recognition and Machine Learning, Springer.
4. Tom.M.Mitchell, Machine Learning, McGraw Hill International Edition
5. EthernAlpaydin, Introduction to Machine Learning. Eastern Economy Edition, Prentice Hall of India.

Course Code: IT18408OE
Course Title: Management Information systems

Unit I

Organization and Information Systems , Changing Environment and its impact on Business - The IT/IS and its influence - The Organization: Structure, Managers and activities - Data, information and its attributes - The level of people and their information needs - Types of Decisions and information - Information System, categorization of information on the basis of nature and characteristics. , Transaction Processing System (TPS) - Office Automation System (OAS) - Management Information System (MIS) - Decision Support System (DSS) and Group Decision Support System (GDSS) - Expert System (ES) - Executive Support System (EIS or ESS).
Need for System Analysis - Stages in System Analysis - Structured SAD and tools like DFD, Context Diagram Decision Table and Structured Diagram

Unit II

System Development Models: Water Flow, Prototype, Spiral, RAD – Roles and responsibilities of System Analyst, Database Administrator and Database Designer. Information systems for Accounting, Finance, Production and Manufacturing, Marketing and HRM functions - IS in hospital, hotel, bank.
Enterprise Resources Planning (ERP): Features, selection criteria, merits, issues and challenges in Implementation - Supply Chain Management (SCM): Features, Modules in SCM - Customer Relationship Management (CRM): Phases

Unit III

Knowledge Management and e-governance, Nature of IT decision - Strategic decision - Configuration design and evaluation Information technology implementation plan.
Security and Ethical Challenges, Ethical responsibilities of Business Professionals – Business, technology, and Computer crime – Hacking, cyber theft, and unauthorized use at work. Piracy – software and intellectual property. Privacy – Issues and the Internet Privacy. Challenges – working condition, individuals. Health and Social Issues, Ergonomics and cyber terrorism.

RECOMMENDED BOOKS:

1. "Management Information Systems", Kenneth J Laudon, Jane P. Laudon, Pearson/PHI,10/e, 2007

2. "Management Information Systems", W. S. Jawadekar, Tata McGraw Hill Edition, 3/e, 2004

3. Turban, Efraim, Ephraim McLean, and James Wetherbe. 2007. Information Technology for Management: Transforming Organizations in the Digital Economy. New York, John Wiley & Sons

COURSE SPECIFICATION

Choice based Credit System (CBCS)
Scheme and course structure for
Information Technology 1st semester effective from academic session 2017 and onwards

Course Code	Name of the Subject	Paper Category	Hours/Week			Credits
IT17101CR	File and Data Structure	Core	3	0	2	4
IT17102CR	Advance Computer Architecture	Core	3	0	2	4
IT17103CR	Open Source Technologies	Core	4	0	0	4
IT17104DCE	Operating System	Elective (DCE)	3	0	0	3
IT17105DCE	Programming with C/C++	Elective (DCE)	3	0	0	3
IT17106DCE	Pervasive Computing	Elective (DCE)	3	0	0	2
IT17107GE	Fundamentals of Grid and Cloud Computing	Elective (GE)	3	0	0	2
IT17108GE	Fundamentals of Programming	Elective (GE)	2	0	0	2
IT17109OE	Fundamentals of Information Technology	Elective (OE)	2	0	0	2
24 Credits						

Scheme and course structure for
Information Technology 2nd semester effective from academic session 2017 and onwards

Course Code	Name of the Subject	Paper Category	Hours/Week			Credits
IT17201CR	Advanced Java Programming	Core	3	0	2	4
IT17202CR	Database Systems	Core	3	0	2	4
IT17203CR	Data Communications	Core	4	0	0	4
IT17204DCE	System Programming	Elective (DCE)	3	0	0	3
IT17205DCE	Object Oriented Analysis and Design	Elective (DCE)	3	0	0	3
IT17206DCE	Numerical and statistical Computing	Elective (DCE)	3	0	0	2
IT17207GE	Discrete Mathematics	Elective (GE)	3	0	0	2
IT17208GE	Fundamentals of Multimedia	Elective (GE)	2	0	0	2
IT17209OE	Fundamentals of Network and Internet	Elective (OE)	2	0	0	2
24 Credits						

Choice based Credit System (CBCS)
Scheme and course structure for
Information Technology 3rd semester effective from academic session 2017 and onwards

Course Code	Name of the Subject	Paper Category	Hours/Week			Credits
IT17301CR	Data Warehouse	Core	3	0	2	4
IT17302CR	Dot Net Technologies	Core	3	0	2	4
IT17303CR	Computer N/W	Core	4	0	0	4
IT17304DCE	S/W Engineering	Elective (DCE)	3	0	0	3
IT17305DCE	Design & Analysis of Algorithms	Elective (DCE)	3	0	0	3
IT17306DCE	Management Information systems	Elective (DCE)	3	0	0	2
IT17307GE	Multimedia Systems	Elective (GE)	3	0	0	2
IT17308GE	Fundamentals of Grid and Cloud Computing	Elective (GE)	3	0	0	2
IT17309OE	Discrete Mathematics	Elective (OE)	3	0	0	2
24 Credits						

Choice based Credit System (CBCS)
Scheme and course structure for
Information Technology 4th semester effective from academic session 2017 and onwards

Course Code	Name of the Subject	Paper Category	Hours/Week			Credits
IT17401CR	Project	Core	0	0	24	12
IT17402DCE	Wireless Communication	Elective (DE)	3	0	0	3
IT17403DCE	Finite automata & Formal Languages	Elective (DE)	3	0	0	3
IT17404DCE	Computer Graphics	Elective (DCE)	3	0	0	2
IT17405DCE	Cryptography & network security	Elective (DCE)	3	0	0	2
IT17406DCE	Project Management	Elective (DCE)	3	0	0	2
IT17407DCE	E Governance	Elective (DCE)	3	0	0	2
IT17408GE	Programming with C/C++	Elective (GE)	3	0	0	2
IT17409OE	Pervasive Computing	Elective (OE)	3	0	0	2
24 Credits						

1st Semester

Course Code: IT17101CR
Course Title: File and Data structures

Unit I

Introduction: Structure and problem solving, Primitive Data Structures: Operation On primitive Data Structures, Recursion Function and its examples.

String Manipulation, String Matching Techniques &Applications (examples: Text Editing, Lexical Analysis).

Unit II

Concept of Stack and Queue.Singly and Doubly-Linked Lists, Circular Linked List, their implementation and comparison. Array based and Linked List based Implementation of stack and Queues and their applications.

Unit III

Searching: Sequential and Binary Search on Array-based ordered lists. Binary Trees, their implementation and traversal. Binary Search Trees: Searching, Insertion and Deletion of nodes. Height Balance and Concept of AVL Trees. Concept and purpose of B-Trees.

Unit IV

Concept of Hash Functions, Hash-tables and Hashing with Chaining. Sorting Techniques: Insertion Sort, Selection Sort, Quick Sort, Heap Sort. External Sorting: k-Way Merge Strategy. File Structure: Sequential Files, Indexed Files, Direct Files.

TEXT BOOKS

1. Trebley and Sorenson: "An Introduction to Data Structures with Applications" McGraw Hill, Kongakusha 1976.

2. Horowitz and Sahni: "Data Structures" SBCS Publication, 1980.

3. Michael J.Folk et al "File Structure an Object Oriented Approach with C++.

4. Data Structures Using C – Aaron Tenenbaum

REFERENCE BOOKS:

1. Fundamentals of data structures – Ellis Horowitz and SartajSahni

2. Data Structures Files and Algorithms – Abhay K. Abhyankar

3. Data Structures and Algorithms – Alfred V. Aho, John E. Hopcroft,Jeffrey D. Ullman (Pearson Education)

Course Code: IT17102CR
Course Title: Advanced Computer Architecture

Unit I

Computer Architecture & Organization. Basic Parallel Processing Architecture, Taxonomy-SISD. MISD, SIMD, MIMD structures, Serial, Parallel & Concurrent Computation, CISC Vs RISC, Structure of Instruction of instruction sets and Desirable Attributes.

Unit II

Basic Concepts of pipelining, Instruction Pipelining. Hazards, Reservation Tables, Collision, Latency, Dynamic pipeline, Vector processing & Vector processors. Cache Memory & Virtual Memory: Structure, Analysis & Design. I/O Systems: Design Issues, Performances Measures. Loosely Coupled & Tightly Coupled Systems, Concurrency & Synchronization, Scalability, Models of Consistency, Application of

Unit III

SIMD Structure- Definition.Types of Interconnected Networks; Baselines, Shuffle-Exchange, Omega, Cuba, Comparison & Application. Mapping Algorithm to array structures, Systolic processors.Mapping design & Optimization, Wave Front Array processor.

Unit IV

Data Flow Graphs, Petri nets, Static & Dynamic DFA. Different Models, Languages, Compilers, dependency Analysis. Message Passing, Program mapping to Multiprocessors, Synchronization

References:

1. A Quantitative Approach by David A. Patterson, John L. Hennessy, David Goldberg

2. 2nd Edition Hardcover, 760 pages Morgan Kaufman Publishers Publication date: January 1996

3. A Hardware/Software Approach David Culler and J.P. Singh with Anoop Gupta

4. Solutions to Selected Exercises in Computer Architecture a Quantitative Approach by Thomas E. Willis, Allan D. Knies, Paperback Published by Morgan Kaufman Publishers Publication date: October 1996 ISBN: 1558604065

5. High-performance Computer Architecture (3rd edition), by Harold Stone ,Addison Wesley.

6. Computer Architecture: Pipelined and Parallel Processor Design by Michael J Flynn. Jones and Bartlett Publishers, 1995..

Course Code: IT17103CR
Course Title: Open Source Technologies

Unit I

Introduction to Linux, History, Difference Between Linux and Windows., Difference Between Linux and Unix, Linux is Virus proof, Various Linux Distributions, Pros and Cons Understanding Files and Directories in Linux - File Structure and hierarchy, File Permissions, root, shell, Using VI editor and command associated with it.Basic Commands –mkdir, touch, ls, pwd, cd, chmod, df, du, dd, adduser, passwd, rm, rmdir, date.

Unit II

Introduction to PHP- History of web programming; how PHP fits into the web environment; installation and configuration, syntax, variables, operators, flow control structures

More language basics; using GET and POST input, working with HTML, forms; built-in and user-defined functions; variable scope; using the PHP manual, getting help

Unit III

Input validation, string manipulation and regular expression functions; date and time functions, code re-use, require(), include(), and the include_path; filesystem functions and file input and output; file uploads; error handling and logging; sending mail, HTTP headers and output control functions; HTTP cookies; maintaining, state with HTTP sessions; writing simple web clients

Unit IV

Introducing MySQL; database design concepts; the Structured Query, Language (SQL); communicating with a MySQL backend via the PHP, MySQL API;

References

1. N. B. Venkateshwarlu (Ed); Introduction to Linux: Installation and Programming, B S Publishers; 2005.

2. Matt Welsh, Matthias KalleDalheimer, Terry Dawson, and Lar Kaufman, Running Linux, Fourth Edition, O'Reilly Publishers, 2002

3. Programming PHP. RasmusLerdorf, Kevin Tatroe., (O'Reilly, ISBN 1565926102)

4. Learning PHP 5. David Sklar, (O'Reilly, ISBN 0596005601)

5. Core PHP Programming. Leon Atkinson, (Prentice Hall, ISBN 0130463469)

Course Code: IT17104DCE
Course Title: Operating Systems

Unit I

Overview Of An Operating System, Resource Management, Operating System Interface, Process Management Concepts, Inter-Process Communication, Process Scheduling, Synchronization, Deadlocks. Case Studies Unix/Linux,windows

Unit II

Memory Management, Linking, Loading, Memory Allocation, Design Issues and Problems, Virtual Memory, Fragmentation, Implementing Virtual Memory, Paging, Segmentation, Virtual Memory Design Techniques, Buffering Techniques, Spooling. Case Studies Unix/Linux, windows.

Unit III

File Management - File Systems & I/O. Device Drivers, Access Strategies, File Systems, File System Organization, Design Techniques. Multiprocessor Systems, Types of Multiprocessor Operating Systems, Design and Implementation Issues. Case Studies Unix/Linux, windows.

REFERENCE BOOKS:

1. Dietel, H.M. "An introduction to operating system" Pearson Education, 2/e.

2. Milenkovic.M. "An Operating System – Concepts &Design".McGraw Hill International Education Computer science series 1992.

3. Peterson. J.L.AbharamSilberschatz. "Operating System Concepts". John wiley ,1989.

4. Tananbum, A. S. "Modern Operating System", Pearson Education.

5. Karnetkar, "Unix Shell Programming", BPB.

Course code:- IT17105DCE
Course Title: Programming with C / C++

Unit I

Arrays: Declaration; initialization; 2-dimensional and 3-dimensional array, passing array to function, strings and string functions, and character arrays. Pointers: variables, swapping data, swapping address v/s data, misuse of address operators, pointers and arrays , pointers to pointers , strings , pointer arithmetic, additional operators , portability, pointers to functions, using pointers with arrays , void pointers .Structures and unions: syntax and use, members, structures as function arguments, structure pointers, array of structures as arguments, passing array of structure members, call by reference.

Unit II:

Functions; prototype, passing parameters, storage classes, identifier visibility, Recursive functions. Command-line arguments. Scope rules, Multi-file programming, Introduction to macros. File processing in C and C++. Introduction to graphics, graphic initialization, graphic modes, drivers, basic drawing functions, Animations- concept and implementation, Building graphical user interface.

Unit III

Introduction to classes and objects; Constructor; destructor; Operator overloading; Function overloading; function overriding; friend function; copy constructor; Inheritance: Single , Multiple, and Multilevel Inheritance; Virtual function and Polymorphism: Dynamic binding, Static binding; Virtual functions; Pure virtual function; concrete implementation of virtual functions; Dynamic binding call mechanism; Implementation of polymorphism;
Templates: Function Templates, Class Templates, Member Function Template and Template Arguments, Exception Handling, Standard Template Library

Reference Books:

.
1. FOSTER AND FOSTER "C by discovery" RRI penram.
2. YASHWANT KANETKAR "Let us C" PHI.
3. E. BALAGURUSWAMI "Programming in ANSI C" Tata McGraw Hill.
4. BJARNE STROUSTRUP "The C++ programming language" Pearson Education.
5. HERBERT SCHILD "C++ The complete Reference" Tata McGraw Hill.
6. ROBERT LAFORE "Object orientation with C++ Programming" Waite Group.

Course Code: IT17106DCE
Course Title: Pervasive Computing

Unit I

Technologies : Past, Present, Future , Pervasive Computing , The pervasive computing market, Device Technology : Hardware , Human-machine interfaces , Biometrics , Operating Systems , Java for Pervasive devices , Device Connectivity : Protocols , Security , Device Management , Web Application Concepts : History of World wide Web . World Wide Web Architecture, Protocols, Transcoding, Client Authentication via the Internet.
WAP : Introduction , Components of the WAP architecture , WAP infrastructure , WAP Security Issues , Wireless Markup Language , WAP push , Products , i-mode , Voice Technology :

Unit II

Wireless Markup Language , WAP push , Products , i-mode , Voice Technology : Basics of Speech Recognition , voice standards , speech applications , speech and pervasive computing , security, Personal Digital assistants : History , Device Categories , PDA Operating Systems , Device Characteristics , Software Components , Standards , Mobile Applications , PDA browsers.

Unit III

Architecture : Server Side Programming in Java : J2EE and overview , Servlets, Enterprise Java Beans , Java Server Pages , Extensible Markup Language , Web services , Model-View-Controller Pattern, Pervasive web application architecture : Background , scalability and availability ,
Smart Card-based authentication via the Internet, Ordering goods , Access via WAP : WAP functionality , Implementation , Access from Personal Digital Assistants: Extending the example application to personal digital assistants. Implementation for synchronized devices, for intermittently connected devices, for connected devices. Access via voice:

Reference Books :

1. JochenBurkhardt, Dr. Horst Henn , Stefan Hepper , Klaus Rintdorff, Thomas schack " Pervasive Computing " Technology and Architecture of Mobile Internet Applications , Pearson Education.

Course Code: IT17107GE
Course Title: Fundamentals of Grid and Cloud Computing

UNIT I

FUNDAMENTALS OF GRID COMPUTING The Grid – Past, Present and Future – Applications of Grid Computing Organizations and their Roles.

GRID COMPUTING ARCHITECTURE Grid Computing Anatomy – Next Generation of Grid Computing Initiatives – Merging the Grid Services Architecture with Web Services Architecture.

GRID COMPUTING TECHNOLOGIES

OGSA – Sample Use Cases that drive OGSA Platform Components – OGSI and WSRF – OGSA Basic Services – Security Standards for Grid Computing – High Level Grid Services.

UNIT II

FUNDAMENTALS OF CLOUD COMPUTING

Fundamentals – Shot history of cloud computing – Cloud Architecture – Cloud Storage – Cloud Service – Pros and Cons of cloud computing – Benefits from cloud computing.

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UNIT III

CLOUD SERVICES

Need for Web-Based Application – The cloud Service Development – Cloud Service, Development Types – Cloud Service development tools.

TEXT BOOKS

1. Joshy Joseph & Craig Fellenstein, "Grid Computing", Pearson Education, 2004.

2. Michael Miller, "Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online", Que, 2008.

REFERENCES

1. Fran Berman, Geoffrey Fox, J.G. Anthony Hey, "Grid Computing : Making the Global Infrastructure a reality", John Wiley & sons, 2003.

2. Hmar Abbas, "Grid Computing: A Practical Guide to technology and Application Charles River media, 2003.

Course Code: IT17108GE
Course Title: Fundamentals of Programming

UNIT I

Introduction to problem, Problem Solving Strategy, solving. Flowchart Definition and Importance of flowchart. Symbols of Flowchart. Flow lines, Terminals, Input/Output, Processing Decision, Connection off-page connectors Guidelines for preparing Flowchart. Flowchart structure Sequence, selection, repetition. Limitation of flowchart.
 Algorithms. Developing and writing algorithm using pseudo codes. Representation of Algorithms as program, pseudo code, Time and Space Complexity of an Algorithm. Common examples for designing Algorithms.

UNIT II.

Introduction to Programming languages, Types of Programming languages. High level , Assembly level, Machine level languages, Scripting Languages. High level languages tools: Editors, Compilers, Interpreters, Linker & loader, GUI , IDE. Type of Program errors
Introduction to programming with C. Fundamentals of C-Variables, data types, arithmetic expression, their priorities. Library functions. Control Structures of C:- for, while and do loops, if then else statements, switch statements. Arrays: Their creation and manipulation, multi-dimensional arrays.

References:

1. "Let Us C " Yashwant Kanetkar
2. "Fundametals of Programming Languages" Palak Kamlesh Tolani , Pearson edition.
3. "The Art of Programming Through Flowchart and Algorithm " Anil Bik as Chaudhuri.
4. Introduction to programming languages. Arvand Kumar Bansal CRC press.

Course Code: IT16109OE
Course Title: Fundamentals of Information Technology

UNIT 1:

Introduction to Information Technology: Basic concepts of IT, Data Processing: Data and Information. Introduction to Computers: Classification, History, Types of Computers; Mini Computers, Micro Computers, Mainframe Computers, Super Computers. Applications of Information Technology:
Block Diagram of The Computer System, Introduction to various units. Hardware: CPU, Memory, Input and Output devices, Auxiliary storage devices. Software: System and Application Software, Utility packages, Configuration of Computer System . Types of Memory RAM, ROM, PROM, EPROM. Secondary Storage Devices (FD, CD, HD, Pen drive). I/O Devices: Scanners Digitizers Plotters, LCD, Plasma Display etc.

UNIT II

CPU type and speed; memory: capacity, type, word size, speed. Hard drive: capacity, speed; fire wire, expansion slots, ports. Number System. Binary, octal and hexadecimal number systems; binary addition and subtraction. Integers (positive and negative): sign and magnitude,
BCD, two's complement; representation of characters, ASCII.
Operating System: History, evolution and structures, Introduction to MS-DOS/WINDOWS/LINUX/UNIX. Data Organization: Drives, Files, Directories. Translators: Assembler, Compiler and Interpreter.

Recomended Books:

1. Raja Raman V., "Fundamental of Computers" (4th edition.), Prentice Hall of India, New Delhi.
2. Trainer T., et al, "Computers", McGraw Hill.
3. Norton, Peter, "Introduction to Computers, Mc-Graw-Hill.
4. S.Jaiswal, "Fundamental of Computer & IT", Wiley dreamtech India.

2nd Semester

Course No: IT17201CR
Course Title: Advanced Java Programming

Unit I

Features of Java, OOPs concepts, Java virtual machine, Reflection byte codes , Byte code interpretation, Data types, variable, arrays, expressions, operators, and control structures Objects and classes Abstract classes, Static classes, Inner classes, Packages, Wrapper classes , Interfaces, This, Super Access control.

Unit II

Exception handling - Exception as objects , Exception hierarchy, Try catch finally, Throw, throws IO package - Input streams, Output streams, Object serialization, Deserialization, Sample programs on IO files, Filter and pipe streams Multi threading - Thread Life cycle, Multi threading advantages and issues , Simple thread program Thread synchronization

Unit III

JDBC architecture, Establishing connectivity and working with connection interface, Working with statements, Creating and executing SQL statements , Working with ResultSet

Unit IV

Overview of JSP, JSP Architecture & life cycle, Components of Java Server Pages, Implicit Objects & Standard JSP Tags, Scope of JSP objects, EJB overview & Architecture, Features of EJB , Developing Web Application with MySQL Database by implementing EJB

References:

1. Programming with Java A Primer, E.Balaguruswamy Tata McGraw Hill Companies

2. Java Programming John P. Flynt Thomson 2nd

3. Java Programming Language Ken Arnold Pearson

4. The complete reference JAVA2, Herbert schildt. TMH

5. Big Java, Cay Horstmann 2nd edition, Wiley India Edition

6. Core Java, Dietel and Dietel

7. Java – Balaguruswamy

8. Java server programming, Ivan Bayross SPD

Course Code: IT17202CR
Course Title: Database Systems

Unit I

Database System Applications, Purpose of Database Systems, View of Data, Database Languages, Relational Databases, Database Architecture, Data Mining and Information Retrieval, Database Models and Comparison, Relation Algebra, ER Model, CODDS Rules, Normalization..

Unit II

Introduction to SQL, Data Types, Data Definition Language, Data Manipulation Language, Transaction Control Language, Integrity Constraints, SQL Functions, Set Operators and Joins, View, Synonym and Index, Sub Queries and Database Objects, Locks and SQL Formatting Commands.

Unit III

Introduction to PLSQL, Architecture, Data Types, Control Structures, Concept of Error Handling, Cursors and Database Triggers, Subprograms and Packages.

Unit IV

Data Storage and Querying using various storage structures, Indexing and Hashing, Query Processing and Optimization. Transaction Management Concepts, Concurrency Control and Recovery.

Reference Books:

William Page,"Using Oracle 9i – Special Edition", Que/PHI.

Database System Concepts by A. Silbershatz, H.F. Korth and S. Sudarshan, 6th edition, 1997, McGraw-Hill, International Edition.
Ivan Bayross, "SQL & PL/SQL Using Oracle 8i & 9i with SQLJ", BPB.

Desai.B , "An introduction to Database Concepts", Galgotia Publications, N.Delhi
Dates.C , " An introduction to Database Systems", Pearson Education, Asia

Course Code: IT17203CR
Course Title: Data Communications

Unit I

Bandwidth and Channel Capacity. Quantifying Channel Capacity for noiseless channel(Nyquist Law) and noisy channel(Shannon's Law). Example of a digital telephone system to explain basic concepts of analog signals, digital signals, sampling. Data Rate versus Baud Rate. Nyquist Criterion for Sampling. Data transmission concepts. Characteristics of signals(amplitude, frequency, period, wavelength, Signal-to-Noise ratio). Key components in data communications systems. Simplified model. Local area network(LAN) concepts and characteristics.

Unit II

Wide area networks(WANs). WAN technologies (traditional packet and circuit switching, Frame Relay, ATM).ISDN(narrowband) concepts and services. Overview of the OSI model. Transmission media – factors affecting distance and data rate. Guided transmission media: Twisted-Pair, Co-axial Cable. Principles and advantages of optical networks. Types of optical fibers and lasers.

Unit III

Unguided transmission media: Terrestrial Microwave & Satellite Microwave systems and applications. Data encoding. Difference between modulation and encoding. NRZ-L, NRZ-I encoding. Multilevel Binary and Biphase Coding techniques and their implementations. ASK,FSK,PSK and QPSK. PCM concepts: sampling, quantization. Delta Modulation. Amplitude Modulation.

Unit IV

Reliable transmission of data: Asynchronous and Synchronous transmission. Error detection: Parity-based, CRC-based. FCS computation. Error control and recovery techniques. Concept of ARQ standard and its versions. Concept of Multiplexing. FDM. Synchronous and Statistical TDM.

Reference Books:
1. William Stallings, "Data and Computer Communications", Pearson Education

2. Andrew Tanenbaum, "Computer Networks", Pearson Education 4/e.

3. Ulysses Black, "Principles of Data Communications ", PHI.

4. Morley, Gelber, "The Emerging Digital Future", Addison-Wesley.

Course Code: IT17204DCE
Course Title: System Programming

Unit I

Introduction, Machine Structure , Evolution of the Components of programming system Evolution of Operating Systems, General Machine Structure , General Approach to a New Machine , Machine Structure 360-370, Machine Language. Assembly Language

Unit II

General Design Procedure, Assemblers, Design of a single pass assembler and multi pass assembler, Macros: two pass algorithm, single pass algorithm, Implementation of macro calls within macros.
Loaders and Linkers, Loader Schemes, subroutine linkages, relocating loaders, Linking loaders, Design of an absolute loader, Design of a direct linking loader.

Unit III

Formal Systems and Programming Languages: Formal specification, Hierarchy of Languages, BNF, Canonic Systems and Formal Systems.

Compilers, Statement of problem, phases of Compiler-Lexical phase, syntax phase Interpretation phase, optimization, storage assignment code generation and assembly phase, Passes of a compiler.

Text Book: John J. Donovan, "Systems Programming", Tata McGrawHill
Reference Books:
Leland L.Beck."System Software" 4th edition Pearson 1997
Barron.D.W."Assemblers and Loaders" Mc Donald and Javes 1978
Ullman.J.D."Fundamentals of Programming System" Addison and Wesley
D.M.Dhamdhere."System Programming and Operating Systems"2nd edition

Course Code: IT17205DCE
Course Title: Object Oriented Analysis & Design

Unit I
OOAD – Introduction , Applying UML and Patterns in OOAD , Assigning Responsibilities , What is analysis and Design , An Example , The UML , Iterative Development –an Unified Process idea , Additional UP Best Practices and Concepts , The UP Phases and Schedule oriented Terms , The UP disciplines. Process Customization and the development case. The Agile UP.The Sequential Waterfall Lifecycle. Inception. Artifacts that may start in inception, Understanding requirements, types of requirements.

Unit II

Use –case Model , Writing requirements in context , goals and stories , background , use cases and adding value , use cases and functional requirements , use case types and formats . Goal and scope of a use case , Finding primary actors , goals and use cases , writing use cases in an essential UI-free style , Actors , Use Case Diagrams , Use Cases within the UP , Case Study. Identifying other requirements. From inception to elaboration.
Use Case Model : Drawing System Sequence Diagrams. Example of an SSD. SSDs and Use Cases , System Events and the System Boundary , Name System Events and Operations , Showing Use Case Text , SSDs within the UP

Unit III

.Domain Model : Visualizing Concepts , Domain Models , Conceptual Class Identification , Candidate Conceptual classes , The UML association notation , NextGen POS Domain Model Associations , NextGen POS Domain Model , Adding Attributes , Non Primitive Data Type Classes , Adding Detail with Operation Contracts , Contract Sections , Post Conditions , Contracts , Operations and the UML. Operation Contracts within the UP.
From Requirements to Design , Interaction Diagram Notation , Sequence and Collaboration Diagrams , GRASP , Responsibilities and methods , interactions diagrams , Patterns , GRASP : Pattern of General Principles in Assigning Responsibilities , Information Expert , creator , Low Coupling , High Cohesion , Controller , Object Design and CRC Cards , Design Model : Use Case Realization with GRASP Patterns , Determining Visibility , Creating Design Class Diagrams , Mapping Design to Code

Reference Books:
1. James Rumbaugh, "Object Oriented Models and Design" Pearson Education 2/e
2. Ali Bahrani "Object Oriented Systems Development" McGraw -Hill 1999
3. Lafore Robert, "Object Oriented Programming in C++", Galgotia Publications.
4. Balagurusami, E, "Object Oriented with C++", Tata McGraw-Hill.
5. D. Ravichandran, "Programming with C++", McGraw-Hill Publications

Course Code: IT17206DCE
Course Title: Numerical and statistical Computing

UNIT I

Introduction. Requirements for computer-oriented solutions to numerical problems. Approximations & Errors – Types of Programming Errors, Computer & Arithmetic Errors, Accuracy and Precision, Round off and Truncation Errors. Propagation of Error. Algorithms to Compute Roots of Equation – Methods of Tabulation or Brute Force Method, Method of Bisection, Secant Method, Newton-Raphson Method, Method for False Position. Implementations of these methods.
Algorithms to Solve Linear Algebraic Equations: Gauss Elimination, Gauss Jordan, Gauss Seidel, L.U. Decomposition,

UNIT II

Lagrange Interpolated Polynomial, Newton Divided Differences Interpolating Polynomial. Implementation of these methods.
Algorithms to solve Ordinary Differential Equations – Euler Method and Modification. The trapezoidal Rule, Simpson's Rule. R-K Method. Implementation of these methods.

UNIT III

Standard Deviation, Correlation, Regression Analysis, Algorithms for Curve Fitting straight line: Least Square Approximation. Concept of Hypothesis, Statistical Tests: Chi-Square Test, Student t-Test, f-Test.

REFERENCE BOOKS:
1. S.C.Chapra & R.P.Canale: "Numerical methods for Engineering". Tata McGraw Hill.

2. Krishenmurty and Sen : "Numerical Algorithms"

3. V. Rajaraman "Computer oriented numerical methods." Prentice Hall of India.

4. McCalla, Thomas Richard: "Introduction to Numerical Methods and FORTRAN Programming", John Wiley & Sons, Inc.

5. Grewal, B. S.: "Higher Engineering Mathematics", Hindustan Offset Problems Series.

6. "SCHAUM'S Solved Problems Series".

7. Sharma, K. D.:"Programming in Fortran".

8. Jain, M. K., Iyengav, S. R. K., Jain, R. K.: "Numerical Methods for Scientific and Engineering Computation"+, Wiley Eastern Ltd, New Delhi

Course Code: IT17207GE
Course Title: Discrete Mathematics

UNIT I

Proposition, Logic, Truth tables, Propositional Equivalence, Logical Equivalence, Predicates and Quantifiers, Sets: operations on sets, Computer representation of sets, Functions: Domain, Range, One-to-One, Onto, Inverses and Composition, Cardinality of a Set, sequences and summations, The growth of functions . Methods of Proof: Different methods of proof, Direct Proof, Indirect Proof, Mathematical Induction for proving algorithms.
Counting: Basic Counting Principle, The Pigeon-Hole Principle, Permutation, combinations, repetitions, discrete probability, Advanced Counting Techniques: Inclusion-Exclusion, Applications of inclusion-exclusion principle

UNIT II

Recurrence relations, solving recurrence relation. Relations: Relations and their properties, Binary Relations, Equivalence relations, Diagraphs, Matrix representation of relations and digraphs, Computer representation of relations and digraphs, Transitive Closures, Warshall's Algorithm.
Partially Ordered Sets (Posets), External elements of partially ordered sets, Hasse diagram of partially ordered set, isomorphic ordered set, Lattices: Properties of Lattices, complemented Lattices

UNIT III

Graph theory: Introduction to graphs, Graph Terminology Weighted graphs, Representing Graphs, Connectivity of Graphs: Paths and Circuits, Eularian and Hamiltonian Paths, Matrix representation of graphs. Graph Coloring.
Trees: Rooted trees, Application of trees: Binary Search Trees, Decision Trees, Prefix Codes, Tree traversal, trees and sorting, spanning trees, minimal spanning trees. Finite Boolean algebra, Functions on Boolean algebra, Boolean functions as Boolean polynomials. Groups and applications: Subgroups, Semigroups, Monoids, Product and quotients of algebraic structures, Isomorphism, Homomorphism

Text Book :
KENNETH H. ROSEN "Discrete Mathematics and Its Applications" The Random House/Birkhauser Mathematics series
Reference Books:
1. LIU "Elements of Discrete Mathematics " Tata McGraw Hill
2. SCHAUMS "Discrete Mathematics " Tata McGraw Hill
3. KOLMAN/REHMAN "Discrete Mathematical Structures " Pearson Education
4. NICODEMI "Discrete Mathematics " CBS

Course Code: IT17208GE
Course Title: Fundamentals of Multimedia

UNIT I

Introduction to Multimedia. Definition, Components of multimedia, Multimedia Past and Present; History, Hypermedia, WWW and Internet, Multimedia Today. Users of multimedia, Applications of Multimedia; Education and Training, Entertainment and Art Industry, Engineering, Research, Communication, Medicine, Marketing and Advertising, Journalism, Sports, Gaming.
Graphics and Images: Image Properties; Resolution, Bit Depth, Color, Aspect Ratio, Dpi , Pixels. Popular Image File Formats: JPEG, GIF,PNG, TIFF. Basics of Image Capture.

UNIT II

A Multimedia System. Features of a Multimedia System, Multimedia PC workstation components; Input Devices / Capture devices, Storage Devices, Communication Ports, Output / Display Devices. Graphics Processor (Internal and external). Examples of Various Multimedia Systems.

UNIT III

Multimedia Configuration: Converging technologies, Functions & subsystems (input, development & output). Multimedia Development Tools: Presentation Tools, Authoring Tools and relevant Examples. Data Compression.
Multimedia Video: Frame Rate, Display; interlaced vs Non-interlaced. Video File Formats: MPEG, AVI. Multimedia Audio: Digital and Analog, Some Audio File Formats. Animation Basics.

References:

1. Fundamentals of Multimedia Ze-Nian Li, Mark S.Drew, Jiangchuan Liu, 2nd Edition (Pearson)

2. Multimedia in Practice Judith Jeffcote (PHI).

Course Code: IT16209OE
Course Title: Fundamentals of Network and Internet

UNIT I

Definitions of data communication and network; communication modes: (simplex, duplex, half duplex), point-to-point, and broadcast. Analog & Digital signal, types of networks: (local area network, wide area network, metropolitan area network). A Data Communication Model and Examples.
Networking Devices: Repeaters, Hubs, Switches, Bridges, Routers, and Gateways. Network

UNIT II

Topologies; Bus, Star, Ring, Mesh, Tree and Hybrid. A Computer network diagram. Adressing: Logical and Physical. Concept of a Protocol. Programs and Processes, Protocol Layering Concepts, Encapsulation and De-capsulation. OSI and TCP/IP model Introduction. Transmission Medium. Types of transmission media: cable/wired media (coaxial, fibre-optic, twisted pair), wireless media (satellite, microwave, infra-red), wireless network technology: (Bluetooth, Wi-Fi), hotspot, modem, bandwidth. Concept of Internet and Intranet

UNIT III
Server, Client and The Client/Server Model. Mail server and Chat Server, HTTP, File Transfer Protocol (FTP), upload, download, World Wide Web (WWW), web browser, web page, website, blogging, Social Networking sites, URL, e-commerce, e-learning, , pod-casting, bulletin board, VoIP. Information Security Basics.

References:

1. "Data Communications and Networking Hardcover" Behrouz A. Forouza, McGraw Hill Education; 5 edition
2. AndrewTanenbaum, "Computer Networks", Pearson Education 4/e.

3rd Semester

Course Code: IT17301CR
Course Title: Data warehousing

Unit I

Data warehouse: Definitions, features, building blocks/ components, data marts, Meta data in data warehouse; planning a data warehouse, The project team, project management considerations, Business requirements; data design, the architectural plan, Data storage specifications, Information delivery strategy.

Unit II

Architecture and Infrastructure: Concept of data warehouse architecture, operational infrastructure, physical infrastructure, hardware and operating systems, database software, tools. The role of metadata, metadata types, metadata requirements. Principles of dimensional modeling: Dimensional modeling basics, Use of CASE tools, The STAR schema, The Snowflake Schema.

Unit III

Data Extraction, Data Transformation, Data Loading. Data Quality: Need, Data Quality Challenges, Data Quality Tools. Information access and delivery, Information delivery tools. Online Analytical Processing (OLAP): Features, functions, OLAP models, Implementation considerations, OLAP platforms, OLAP tools and products.

Unit IV

Introduction to Data Mining: definitions, Data mining techniques, applications. Physical Design in data warehouse: Steps, Physical Design considerations, Physical storage. RAID technology, estimating storage sizes, Indexing the data warehouse: B-Tree Index, Bitmapped Index, Clustered Index Performance Enhancement Techniques: Data Partitioning, Data Clustering, Parallel processing, data arrays.Data warehouse deployment.

Text Book:
PaulrajPooniah , " Data Warehousing Fundamentals " Wiley

Reference:
Alex Berson , Stephen J. Smith " Data Warehousing , Data Mining and OLAP , Tata McGraw Hill , 2004 Tenth reprint 2007.
Sam Anahory , Dennis Murray ," Data Warehousing in the real world " , Pearson Education

Course No: IT17302CR
Course Title: Dot NET Technologies

UNIT I

HTML - Concepts of Hypertext, Versions of HTML, Elements of HTML syntax, Head & Body Sections, Building HTML documents, Inserting texts, Images, Hyperlinks, Backgrounds and Colour controls, Different HTML tags, Table layout and presentation, Use of front size & Attributes List types and its tags, Use of Frames and Forms in web pages

Introduction to .NET Framework, .NET Architecture, CIL and JIT, Assemblies, Managed Code, Garbage Collection, MSIL and Metadata, CLR, CLI, CLS.

UNIT II

VB.NET Concepts: Flow Control, Type Conversions, Complex Variable Types, Arrays, Structs, String Manipulation. Functions, Debugging and Error Handling. Object Oriented Programming using C#, Collections, Comparisons and Conversions. Generics.

UNIT III:

Basic Windows Programming: Controls, Button, Label and Link Label, Text Box, Radio and Checkbox, RichTextBox, List and CheckBoxes, TreeView and ListView Controls, Tab Control. Menus and ToolBars, SDI and MDI Applications.

UNIT IV

ASP.NET Web Programming: Site Management (Client and Server Side), Styles, Master Pages, Site Navigation, Authentication and Authorization, Web Service. **Data Access:** Streams, XML, Connection and Command Objects, Data Reader, Data Adapter, Data Set.

Text Book : Professional VB.NET 2010 by Christian Nagel , Bill Evgen , Jay Glynn Wrox Publications , 2006.
Reference
1. Dietel&Dietel , "VB.NET , How to Program",Pearson Education.
2. Visual Basic.Net by John Sharp & John Jagger, PHI, New Delhi.
3. Visual Studio .Net by Francisco, Microsoft Publication.

Course Code: IT17303CR
Computer Networks

Unit I

Goals and applications of networks.LAN, MAN & WAN architectures.Concept of WAN subnet.Overview of existing networks. OSI Reference Model Architecture, TCP/IP Model and their comparison.

UNIT II

Review on Computer Networks Basis Data Link control: Line discipline, Flow and error control protocols,Physical addressing, HDLC MAC Protocols: Dynamic channel allocation, Random access and Controlled access techniques, IEEE Standards.

UNIT III

LAN Interconnection technologies and High Speed LANs, Virtual LANs. Virtual Circuit approach in WANs.IP address –ClassfulIP Adressingsubnetting, NAT, IP datagrams address mapping, error reporting and multicasting in network layer,

UNIT IV

Static and Adaptive routing, Distance vector and Link-State routing, Broadcast routing, Unicast routing protocols: interior and exterior routing protocol. RIP, OSPF and BGP,Internet control protocols: ICMP, Multicast routing protocols – Source-Based tree and Group-Shared tree approach.

Reference Books:
1.AndrewTanenbaum, "Computer Networks",4th Edition by Pearson.
2.Douglas Comer, "Internetworking with TCP/IP, Volume 1",
Pearson. 3.W.Richard Stevens, "UNIX Network Programming",
Pearson. 4.Maufer, "IP Fundamentals", Pearson.
5. Douglas Comer, "Client-Server Programming with TCP/IP, Volume 3",Pearson.

Course Code: IT17304DCE
Course Title: Software Engineering

Unit I

Introduction: Software engineering, Evolving role of software, Concept of software, Changing nature of software, Software Myths, Software Importance, Characteristics, Software Components, Software crises, Software Engineering Challenges (Scale, Quality Productivity, Consistency and Repeatability, Change), Software standard, Software Engineering approach.

Software Process Management: Software process, phase's framework, capability maturity model integration (CMMI), Process patterns, process assessment, personal and team process models (PSP, TSP) process technology, characteristics of software process

Unit II

Introduction to software process models waterfall, incremental process models, Evolutionary process model. Process Planning, Estimation, COCOMO Model, Project Scheduling and staffing Risk management (concepts, Risk assessment, and Risk control)

Introduction to Software Requirement Analysis and Specification: software requirement, (need for SRS requirement process), problem analysis (informal approach, data flow modeling, object –Oriented modeling, prototyping), requirement specification (characteristics, components), Concept of Use Cases, Concept of validation.

Unit III

Design Engineering: Function oriented design, Design principles, Coupling and Cohesion, Design Notations & Specifications, Structured Design Methodology; Object-Oriented Design, OO Concepts, Design Concepts, Design Methodology (Dynamic & Functional Modeling), Design Verification.

CASE (Computer Aided Software Engineering): Concept, scope, CASE Support in Software Life Cycle, Documentation, Project management.

References:

1. ROGER S. PRESSMAN - Software Engineering - A Practitioner's Approach, Sixth edition,

2. PankajJalote - An Integrated approach to Software Engineering, 3rd edition, Narosa Publication.

3. Sommmerville - Software Engineering. Pearson , 7/e , 2006. SCHAUM'S Outlines, TMH.

4. JAMES F. PETERS Software

Course Code: IT17307GE
Course Title: Multimedia Systems

UNIT I

Introduction to multimedia, Definition, Elements of multimedia, Need of multimedia, Applications, Goal & Objectives, Users of multimedia, Benefits of Multimedia, Training, Sales, Communication, Medicine. Multimedia & Internet. Multimedia Configuration: Converging technologies, Functions &subsystems (input, development & output). Multimedia PC workstation components. Multimedia platform, Multimedia H/w, System software, Multimedia OS File system(tiff, bmp, pcx, gif, jpeg etc.)Multimedia communication system. Development Tools: Developing applications, commercial tools, standards. Image and application image capture, Compression, text conversion, vaporization, image compression, Standards for encoding images, Standards for compression bitonal images, JPEG, Fractals for compression.

UNIT-II

Multimedia Graphics: 2D/3D animation fundamentals, color modules digital, imaging, still and moving images, Video application, video capture, animation video, processing, video recovery techniques, Creating videos on the desktop, Television(Broadcast TV, HDTV), Compression standards, AVI file formats, NTSC,PAL, video/audio conferencing techniques and standards.
Multimedia Audio: Basic sound concepts, audio, capture, music, speech, sound processor, sound recovery technique, VOC and WAV file formats for sound. Compression standards (Audiovisual telephony & application)

UNIT-III

Multimedia Devices: Mass storage systems for multimedia requirements, Magnetic devices, Optical devices, CD-ROM, DVD, scanners, types & specifications.
Multimedia in Real World: Multimedia on network, Multimedia databases (in Oracle), Windows support for sound, animation, movies, music. Training &education: need for training, multimedia in training and education. Multimedia for information and sales, Multimedia in office & home. Impact of Multimedia – Developing Applications: Introduction, Methodology, design. Multimedia objects, different kinds of object, object technology, Sharing multimedia, working in groups, workflow management, collaborative computing.

References:
1. Multimedia in Practice – Judith Jeffcote (PHI)

2. Multimedia Computing, Communication & Applications – Ralf Steinmetz,KlaraNahrstedt (PH-PTR Innovative technology series)

3. Multimedia, Production, Planning & Delivery – John Villamil, Casanova(PHI)

4. Virtual Reality and Multimedia – Durano R. Begault (AP professionals)

5. Principles of Interactive Multimedia – Elsom, Cook (TMH)

Course Code: IT17306DCE
Course Title: Management Information systems

Unit I

Organization and Information Systems , Changing Environment and its impact on Business -
The IT/IS and its influence - The Organization: Structure, Managers and activities - Data,
information and its attributes - The level of people and their information needs - Types of
Decisions and information - Information System, categorization of information on the basis
of nature and characteristics. , Transaction Processing System (TPS) - Office Automation
System (OAS) - Management Information System (MIS) - Decision Support System (DSS)
and Group Decision Support System (GDSS) - Expert System (ES) - Executive Support
System (EIS or ESS).
Need for System Analysis - Stages in System Analysis - Structured SAD and tools like DFD,
Context Diagram Decision Table and Structured Diagram

Unit II

System Development Models: Water Flow, Prototype, Spiral, RAD – Roles and responsibilities
of System Analyst, Database Administrator and Database Designer. Information systems for
Accounting, Finance, Production and Manufacturing, Marketing and HRM functions - IS in
hospital, hotel, bank.
Enterprise Resources Planning (ERP): Features, selection criteria, merits, issues and
challenges in Implementation - Supply Chain Management (SCM): Features, Modules in
SCM - Customer Relationship Management (CRM): Phases

Unit III

 Knowledge Management and e-governance, Nature of IT decision - Strategic decision -
Configuration design and evaluation Information technology implementation plan.
Security and Ethical Challenges, Ethical responsibilities of Business Professionals – Business,
technology, and Computer crime – Hacking, cyber theft, and unauthorized use at work. Piracy –
software and intellectual property. Privacy – Issues and the Internet Privacy. Challenges –
working condition, individuals. Health and Social Issues, Ergonomics and cyber terrorism.

RECOMMENDED BOOKS:

1. "Management Information Systems", Kenneth J Laudon, Jane P. Laudon, Pearson/PHI,10/e,
2007

2. "Management Information Systems", W. S. Jawadekar, Tata McGraw Hill Edition, 3/e, 2004

3. Turban, Efraim, Ephraim McLean, and James Wetherbe. 2007. Information Technology
for Management: Transforming Organizations in the Digital Economy. New York, John
Wiley & Sons.

Course Code: IT17305DCE
Course Title: Design and Analysis of Algorithms

Unit I

Introduction to Algorithms, Analysis of algorithms, Designing Algorithms, Growth of Functions, Asymptotic notations, Recurrences , Substitution method , Iteration method, Recursion trees , The Master Method, Time and Space Complexity study of some basic algorithms.
Randomized Algorithms: Identifying the repeated element, Primality testing, Advantages and Disadvantages.

Unit II

Divide and Conquer, General method, Binary search, Quick sort. Greedy Method, General method, Knapsack problem, Single source shortest paths.
Dynamic programming, General methods, All pair shortest paths, Traveling salesman problems. Backtracking, General method, 8-Queen problem, Sum of subsets, Knapsack problem. Branch and Bound, General method, Least Cost Branch and Bound, 8-Queen Problem, Traveling salesperson problem.

Unit III

Lower boundary theory, Lower bound theory through reductions, P and NP problems. NP hard and NP complete problems. Approximate Algorithms and their need, the vertex Cover Problem, The traveling salesman problem, The subset sum problem.

Text Book:
2. Pearson Horowitz, Sahni, " Fundamentals of Computer Algorithms", Galgotia Publications
3. Goodrich and Tamassia " Algorithm design"

Reference Books:
1. Coremen, Leiserson, Rivest,Stein, "Introduction to Algorithms", 2nd edition, PHI.
2. Aho, Hopcroft and Ullman, "The Design and Analysis of Computer Algorithms", Pearson.

Course Code: IT16308GE
Course Title: Fundamentals of Grid and Cloud Computing

UNIT I

FUNDAMENTALS OF GRID COMPUTING The Grid – Past, Present and Future – Applications of Grid Computing Organizations and their Roles.

GRID COMPUTING ARCHITECTURE Grid Computing Anatomy – Next Generation of Grid Computing Initiatives – Merging the Grid Services Architecture with Web Services Architecture.

GRID COMPUTING TECHNOLOGIES

OGSA – Sample Use Cases that drive OGSA Platform Components – OGSI and WSRF – OGSA Basic Services – Security Standards for Grid Computing – High Level Grid Services.

UNIT II
FUNDAMENTALS OF CLOUD COMPUTING

Fundamentals – Shot history of cloud computing – Cloud Architecture – Cloud Storage – Cloud Service – Pros and Cons of cloud computing – Benefits from cloud computing.
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UNIT III
CLOUD SERVICES

Need for Web-Based Application – The cloud Service Development – Cloud Service, Development Types – Cloud Service development tools.

TEXT BOOKS

1. Joshy Joseph & Craig Fellenstein, "Grid Computing", Pearson Education, 2004.

2. Michael Miller, "Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online", Que, 2008.

REFERENCES

1. Fran Berman, Geoffrey Fox, J.G. Anthony Hey, "Grid Computing : Making the Global Infrastructure a reality", John Wiley & sons, 2003.

2. Hmar Abbas, "Grid Computing: A Practical Guide to technology and Application Charles River media, 2003.

Course Code: IT16309OE
Course Title: Discrete Mathematics

UNIT I

Proposition, Logic, Truth tables, Propositional Equivalence, Logical Equivalence, Predicates and Quantifiers, Sets: operations on sets, Computer representation of sets, Functions: Domain, Range, One-to-One, Onto, Inverses and Composition, Cardinality of a Set, sequences and summations, The growth of functions . Methods of Proof: Different methods of proof, Direct Proof, Indirect Proof, Mathematical Induction for proving algorithms.
Counting: Basic Counting Principle, The Pigeon-Hole Principle, Permutation, combinations, repetitions, discrete probability, Advanced Counting Techniques: Inclusion-Exclusion, Applications of inclusion-exclusion principle.

UNIT II

Recurrence relations, solving recurrence relation. Relations: Relations and their properties, Binary Relations, Equivalence relations, Diagraphs, Matrix representation of relations and digraphs, Computer representation of relations and digraphs, Transitive Closures, Warshall's Algorithm.
Partially Ordered Sets (Posets), External elements of partially ordered sets, Hasse diagram of partially ordered set, isomorphic ordered set, Lattices: Properties of Lattices, complemented Lattices.

UNIT III

Graph theory: Introduction to graphs, Graph Terminology Weighted graphs, Representing Graphs, Connectivity of Graphs: Paths and Circuits, Eularian and Hamiltonian Paths, Matrix representation of graphs. Graph Coloring.
Trees: Rooted trees, Application of trees: Binary Search Trees, Decision Trees, Prefix Codes, Tree traversal, trees and sorting, spanning trees, minimal spanning trees. Finite Boolean algebra, Functions on Boolean algebra, Boolean functions as Boolean polynomials. Groups and applications: Subgroups, Semigroups, Monoids, Product and quotients of algebraic structures, Isomorphism, Homomorphism

Text Book :
KENNETH H. ROSEN "Discrete Mathematics and Its Applications" The Random House/Birkhauser Mathematics series
Reference Books:
1. LIU "Elements of Discrete Mathematics " Tata McGraw Hill
2. SCHAUMS "Discrete Mathematics " Tata McGraw Hill
3. KOLMAN/REHMAN "Discrete Mathematical Structures " Pearson Education
4. NICODEMI "Discrete Mathematics " CBS

4th Semester

Course Code: IT17401CR
Course Title: Project

Course Code: IT17402DCE
Course Title: Wireless Communications

Unit I

Classification and types of Wireless telephones. Introduction to Cordless, Fixed Wireless(WLL), Wireless with limited mobility(WLL-M) and (Fully)Mobile Wireless phones. Introduction to various generations of mobile phone technologies and future trends.Wireline vs. Wireless portion of mobile communication networks. Mobile-Originated vs. Mobile-Terminated calls. Mobile-Phone numbers vs. Fixed-Phone numbers; Billing Issues.

Unit II

Electromagnetic spectrum, its use and allocation to well-known bands. Concept of cells, sectorization, coverage area, frequency reuse, cellular networks & handoffs.
Wireless Transmission concepts; types of antennas, signal propagation, multipath propagation.Comparison of FDM, TDM and CDM techniques. Basic concepts of Spread Spectrum(SS) technique; Direct Sequence SS versus Frequency Hopping SS.

Unit III

Simplified implementation of IS-95 CDMA using chip sequences. Concept of CDMA(PCS& Cellular) channel; Forward and Reverse CDMA channel for a cell/sector. Concept of(Walsh)Code Channels within a CDMA Channel. Purpose of Pilot, Sync, Paging, Forward Traffic Channels.Purpose of Access & Reverse TCs. Comparison of Cellular and PCS CDMA networks; frequencies and cell-sizes. Advantages/Disadvantages of smaller cell size. Concept of Voice Coding . Components of Mobile Network Infrastructure: MS, BTS, BSC, MSC; their basic functions and characteristics. Types of handoffs in GSM.Use of HLR and VLR in mobile networks.

References Books:

1. Andy Dornan, "The Essential Guide to Wireless Communications Applications", Pearson.

2. Jochen Schiller, "Mobile Communications", Pearson.

3. K.Pahlavan, P.Krishnamurthy, "Principles of Wireless Networks", Pearson Education.

4. Andrew Tanenbaum, " Computer Networks(4th Edition)", Pearson Education.

5. T. Rappaport, "Wireless Communications, Principles and Practice (2nddEition). Pearson Education

Course Code: IT16403DCE
Course Title: Fine automata & Formal Languages

Unit I
Basic concepts of theory of computation: Formal Languages and Grammars, Finite State Transducers, Finite-State Automata and Regular Languages, Limitations of Finite-Memory Programs.
Recursive finite-domain programs, Recursion,

Unit II
Pushdown Transducers, Context-Free Languages, Limitations of Recursive Finite-Domain Programs
Turing Machines. Programs and Turing Transducers, Universal Turing Transducers, Undecidability.

Unit III
Introduction to resource-bounded computation, Time and Space, A Time Hierarchy, Nondeterministic Polynomial Time, some *NP*-Complete Problems

Text Book:
1. Hopcroft, J., and Ullman, J. (1979), "*Introduction to Automata Theory, Languages and Computation*", Pearson Education.
1. P. Linz, "*Introduction to Formal Languages and Automata*", 3rd edition, 2000, Jones and Barlett, PWS Publishing Company.

Suggested Readings:
1. Eiton Gurarri : *Introduction to Theory of computation*, Computer Science press

2. Hopcroft J, R. Motwani, and J. Ullman, "*Introduction to Automata Theory, Languages and Computation,* 3rd Ed. 2006, Pearson Education.

Course Code: IT16404DCE
Course Title: Computer Graphics

Unit I

Introduction to Computer Graphics. Applications of Computer Graphics. Graphic Display Devices_ Raster, Refresh, Random. Display Buffer, Concept of Double Buffering and Segmentation of Display Buffer. Use of Lookup tables. OpenGL API.
2-D Graphics. Cartesian and Homogeneous Coordinate Systems. Line drawing algorithms (Bressenhams and DDA). Circle and Ellipse Drawing Algorithms. 2-Dimensional Transformations.Concepts of Window & Viewport, Window to Viewport Transformations. Filling, Boundary and Floodfill algorithms.

Unit II

Clipping, Line Clipping Algorithms (Cohen-Sutherland Algorithm), 3-D Graphics, Projections: perspective and parallel projection transformations. 3-Dimensional Transformations. Hidden Surface Removal Techniques, Z-Buffer Algorithm, Back Face Detection.

Unit III:

Curves and Surfaces, Splines, Spline specification, Interpolated & Approximated Splines. Bezier Splines, Bezier Curves, Cubic Bezier Curves, Bezier Surfaces. B-Splines curves and surfaces. Fractals - Fractal Generation Procedure.

Text Book : Hearn and Baker " Computer Graphics" 2nd Edition , Pearson Education.
Reference Books
1. W.M.Newman and Sproull. "Principles of interactive Computer Graphics" ,TMH
2.Steven Harrington." Computer Graphics a Programming Approach" McGraw Hill.
3. Plastock and Kelley. "Schaums outline of theory and problems of computer Graphics"
4. David F Frogers and J Alan Adams. "Procedural Elements of Computer Graphics" McGraw Hill
5. David F Rogers and J Alan Adams. "Mathematical Elements of Computer Graphics" McGraw Hill
6. James. D. Foley, A Vandam etal "Computer Graphics" Pearson.

Course Code: IT16405DCE
Course Title: CRYPTOGRAPHY & NETWORK SECURITY

Unit I

Fundamentals of network security, Secure channels via encryption. Block ciphers and encryption modes. Message Authentication Codes., Stream ciphers. Authentication mechanisms. Kerberos. Public key cryptography, RSA scheme. SSL scheme..
Basics: Introduction, Protocol Structure Specification and Modeling: Validation Models, Correctness requirements, Protocol Design, Finite State machines

UNIT II

Mechanics of Routing Protocols, Internet working with Dissimilar Protocols, Future of Routing, Protocol

Designing: Simplicity VS flexibility VS Optimality, Overhead and scaling, Operation above Capacity, forward compatibility, Migration: Routing Algorithms and addressing parameters, making multi-protocol operation possible, Robustness, determinism VS Scalability, performance for correctness.

UNIT III

Design Tools: A protocol Simulator, A Protocol Validator, using the validator, Network Security: Features Security in Wireless, Adhoc and Sensor Networks

Reference Books:

1. William Stalling ,” cryptography and Network Security”, Pearson Education

2. Interconnections: Bridges, Routers switches and Internet-working protocols Radia Perlman Pearson education) 2. IP Routing Fundamentals Mark Sportack (Pearson Education)

3. Design and Validation Computer Protocols : Gerard J. Holzmann (Prentice Hall)

Course Code: IT17406DCE
Course Title: Project Management

Course Code: IT17407DCE
Course Title: e Governance

Course code: - IT17408GE
Course Title: Programming with C / C++

Unit I

Arrays: Declaration; initialization; 2-dimensional and 3-dimensional array, passing array to function, strings and string functions, and character arrays. Pointers: variables, swapping data, swapping address v/s data, misuse of address operators, pointers and arrays , pointers to pointers , strings , pointer arithmetic, additional operators , portability, pointers to functions, using pointers with arrays , void pointers .Structures and unions: syntax and use, members, structures as function arguments, structure pointers, array of structures as arguments, passing array of structure members, call by reference.

Unit II:

Functions; prototype, passing parameters, storage classes, identifier visibility, Recursive functions. Command-line arguments. Scope rules, Multi-file programming, Introduction to macros. File processing in C and C++. Introduction to graphics, graphic initialization, graphic modes, drivers, basic drawing functions, Animations- concept and implementation, Building graphical user interface.

Unit III

Introduction to classes and objects; Constructor; destructor; Operator overloading; Function overloading; function overriding; friend function; copy constructor; Inheritance: Single , Multiple, and Multilevel Inheritance; Virtual function and Polymorphism: Dynamic binding, Static binding; Virtual functions; Pure virtual function; concrete implementation of virtual functions; Dynamic binding call mechanism; Implementation of polymorphism;
Templates: Function Templates, Class Templates, Member Function Template and Template Arguments, Exception Handling, Standard Template Library

Reference Books:

.
1. FOSTER AND FOSTER "C by discovery" RRI penram.
2. YASHWANT KANETKAR "Let us C" PHI.
3. E. BALAGURUSWAMI "Programming in ANSI C" Tata McGraw Hill.
4. BJARNE STROUSTRUP "The C++ programming language" Pearson Education.
5. HERBERT SCHILD "C++ The complete Reference" Tata McGraw Hill.
6. ROBERT LAFORE "Object orientation with C++ Programming" Waite Group.

Course Code: IT17409OE
Course Title: Pervasive Computing

Unit I

Technologies : Past, Present, Future , Pervasive Computing , The pervasive computing market, Device Technology : Hardware , Human-machine interfaces , Biometrics , Operating Systems , Java for Pervasive devices , Device Connectivity : Protocols , Security , Device Management , Web Application Concepts : History of World wide Web . World Wide Web Architecture, Protocols, Transcoding, Client Authentication via the Internet.
WAP : Introduction , Components of the WAP architecture , WAP infrastructure , WAP Security Issues , Wireless Markup Language , WAP push , Products , i-mode , Voice Technology :

Unit II

Wireless Markup Language , WAP push , Products , i-mode , Voice Technology : Basics of Speech Recognition , voice standards , speech applications , speech and pervasive computing, security, Personal Digital assistants : History , Device Categories , PDA Operating Systems , Device Characteristics , Software Components , Standards , Mobile Applications , PDA browsers.

Unit III

Architecture : Server Side Programming in Java : J2EE and overview , Servlets, Enterprise Java Beans , Java Server Pages , Extensible Markup Language , Web services , Model-View-Controller Pattern, Pervasive web application architecture : Background , scalability and availability ,
Smart Card-based authentication via the Internet, Ordering goods , Access via WAP : WAP functionality , Implementation , Access from Personal Digital Assistants: Extending the example application to personal digital assistants. Implementation for synchronized devices, for intermittently connected devices, for connected devices. Access via voice:

Reference Books :

1. JochenBurkhardt, Dr. Horst Henn , Stefan Hepper , Klaus Rintdorff, Thomas schack " Pervasive Computing " Technology and Architecture of Mobile Internet Applications , Pearson Education.