Code	Subject Title	Cr. Hrs	Semester
IT-207	Data Structure and Algorithm	3	IV
Year	Discipline		
2	Information Technology		

Objectives

This course is designed to teach students structures and schemes, which allow them to write programs to efficiently manipulate, store, and retrieve data. "An apprentice carpenter may want only hammer and saw, but a master craftsman employs many precision tools". Computer programming likewise requires sophisticated tools to cope with complexity of real applications and only practice with these tools will build skill in their use. This subject deals to make students convenient in building a memory and time efficient data structures for the implementation of large-scale (data intensive) computer systems. The following topics will be covered in the course: Introduction to Data Structures and Algorithms, Review of Object Oriented Programming Concepts, Algorithm Specification, Big Oh notation, Introduction to ADTs, Sparse Matrices, Stack, Recursion, Queue, Circular and Double Ended Queue, Self-Referencing Classes and Dynamic Memory Allocation, Singly Linked Lists, Doubly Linked Lists, Binary Search Tree, Introduction to Balanced and AVL Trees, Heaps, Searching, Hashing, Overflow Handling, Dynamic Hashing, Sorting types and Techniques (Selection, Bubble, Insertion, Shell, Radix, Merge, Quick, Heap, and Tree sorts), Graphs, Adjacency List and Adjacency Matrix, Breadth First Search and Depth First Search, Spanning Trees (BFSST, DFSST), Standard Template Library.

Prerequisites

Object Oriented Programming
Discrete Mathematics

Text Book

- Horowitz, Sahni, and Mehta, *Fundamentals of Data Structures in C++*, Computer Science Press, 1995. ISBN-10: 0929306376

Reference Material

- *Tanenbaum*, M. Augenstein, and Y. Lang Sam, *"Data Structures using C and C++"* 2nd Ed., Prentice Hall, 1999, ISBN-10: 0130369977
- A. Drozdek, *Data Structures and Algorithms in C++*, 3rd Edition, Course Technology, 2005.
- L. Nyhoff, *ADTs, Data Structures, and Problem Solving with C++*, 2nd Edition, Prentice Hall, 2005.
- M.A.Weiss, *Data Structures and Algorithm Analysis in C++*, 3rd Edition, Addison-Wesley, 2007.
- Frank M. Carrano, Paul Helman, Robert Veroff, *Data Abstraction and Problem Solving with C++*, 2nd edition, *Addison-Wesley, 1998.* ISBN-10: 0201874024
- Standish, *Data Structures in JAVA*, Addison Wesley, 2000, ISBN-10: 020130564X
- Robert L. Kruse, *Data Structure and Program Design*, ISBN-10: 0137689950

BS (4 Years) for Affiliated Colleges

Code	Subject Title	Cr. Hrs	Semester
IT- 402	**Enterprise Application Development**	**3**	**VII**
Year	Discipline		
4	**Information Technology**		

Objectives:

This course intends to teach the technologies underpinning modern enterprise wide applications including client-server, distributed and object-based systems. The purpose of the course is to explain the role of enterprise java beans in enterprise application development and its relationship to other J2ee technologies such as JSP, Servlets , JMS, CORBA and xml .This course includes explanation of EJB architecture: role of EJB container ,transaction control, authorization control and object pooling and EJB development lifecycle: Java source code compilation ,XML deployment descriptors , EJB compilation and deployment and use by an application server. It will provide a sound foundation for distributed application development. Emphasis of the course is on enterprise level development of applications. The following topics will be covered in this course: Overview of enterprise Java beans: Component architecture and service oriented architecture, Enterprise application design issues , Distributed computing model applying RMI, Naming and directory service(JNDI,LDAP) overview, Enterprise Fundamentals: Enterprise beans overview ,types of beans ,Entity beans: CMP,BMP and session beans: Stateless session beans and stateful session beans , Development of an EJB component: Remote interface ,Home interface, local interface, local home interface, bean class ,deployment descriptor and bean deployment Introduction to JMS and MDBs , Introduction to Jini ,Introduction to Java namespaces, Introduction to Java Mail API, Introduction to Java cryptography, Model view controller.

Prerequisites

None

Text Book

Ed Roman and Gerald brose, Mastering Enterprise Java beans, 3rd Edition.

Recommended Books:

- Floyd marinescu, EJB design patterns.
- Subrahmanyam Allamaraju, Professional Java Server programming J2EE, Edition-volume 1,Wrox-spd.
- http://www.java.sun.com.j2ee
- http://www.javaworld.com
- http://www.serverside.com
- http://www.jeeolympus.com
- http://www.bea.com
- http://www.onjava.com
- http://www.javaskyline.com

Code	Subject Title	Cr. Hrs	Semester
IT-306	Operating Systems (CMP)	3	V
Year	Discipline		
3	Information Technology		

Objectives

The objective of this course is to give students knowledge of construction and working of Operating systems, to enable them to understand management and sharing of computer resources, communication and concurrency and develop effective and efficient applications and also to appreciate the problems and issues regarding multi-user, multitasking, and distributed systems. The following topics will be covered in the course: Introduction to Main Frames System, multi programmed System, batch system, Time sharing system, Desktop System, Multiprocessor system, distributed system, client server, Real time system, Hand held System, Computer System Structure, Caching, Coherency and consistency, Operating System Structure, Process management, System calls, Process control, Communication, micro-kernels, Virtual machines, Processes, Threads, multithreading models, CPU Scheduling, Process Synchronization, Critical section problem, Semaphores, Deadlock, Memory Management, Memory allocation, Fragmentation, Paging, Segmentation, Virtual Memory, Demand paging, Page replacement, Allocation of frames, Thrashing, File System Interface, Directory structure, File system mounting, File System Implementation, NFS, Protection.

Prerequisites

Data Structures and Algorithms

Text Book

Silberschatz A., Galvin P.C., and Gagne G., *Operating Systems Concepts*, 8th Edition, 2008

Reference Material

- Tanenmaum A.S., *Modern Operating Systems*, 2nd Edition, 2001. ISBN-10: 0130313580

Code	Subject Title	Cr. Hrs	Semester
IT-401	**Network Management and Administration**	**3**	**VII**
Year	Discipline		
4	**Business Administration**		

Objectives:

The objective of this course is to provide a practical as well as theoretical basis for managing and administrating networks. The following topics will be covered in this course: Network Management Overview, Case Histories of Networking & Management, Organization and Information Models, Communication and Functional Models, Simple Network Management Protocol (SNMP), Remote Monitoring & Web-Based Management, Broadband Network Management, Tools, Systems and Applications, Introduction to windows XP and 2003 server, Review of File sharing, Users Accounts and groups, How DNS works, DHCP server, Managing web services using IIS, Remote Access Services, Disk Management, Overview of the Active Directory, Integrating DNS with the Active Directory, Introduction to Linux, User Administration & Disk Management, Samba server, Web Server, Firewall, An Introduction to IP Tables, Internet Traffic Management using Squid, Remote Disk Access with NFS

Prerequisites

Computer Networks

Text Book

Mani Subramanian, *Network Management – Principles and Practice*.

Code	Subject Title	Cr. Hrs	Semester
IT-206	Software Engineering	3	IV
Year	Discipline		
2	Information Technology		

Objectives

The aim of this is course is to study various software development models and phases of software development life cycle. The concepts of project management, change control, process management, software development and testing are introduced through hands-on Team Projects. The following topics will be covered in the course: The Scope of Software Engineering, Software Process, Software Development Life Cycle, Project Management Concepts, (Planning, Costing, Risk Analysis, Quality Assurance, Risk Management, 4Ps of Project Management), Software Measurement concepts, Product metrics (LOC based and FP based metrics), Software Quality Metrics, Software Project Planning, Software Cost Estimation techniques, COCOMO model, Project Scheduling, (GANTT chart, Critical Path Method), Requirements Engineering, Use Case Techniques, Entity Relationship Diagram, State Transition Diagram, Data Flow Diagrams, Software Designing, Abstraction, refinement, modularity, software architecture, Cohesion & Coupling, Architectural Design, Data Design, Mapping ER to Data Model, Interface Design, Human Computer Interface, Modular Design, Mapping Design to Code, Software Testing, White Box Testing & Black Box Testing, Test Case Design using Cyclometic Complexity Technique, Debugging practices, Software Inspection, Software Quality Assurance, Software Quality Standards.

Prerequisites

Databases

Text Book

Roger Pressman, *Software Engineering: A Practioner's Approach,* McGraw-Hill, 2005. ISBN 9780073019338

Code	Subject Title	Cr. Hrs	Semester
STAT-221	Probability and Statistics	3	IV

Year	Discipline
2	Information Technology

Objectives

This course is aimed to introduce the concept of statistics, randomness and probability and build on these concepts to develop tools and techniques to work with random variables. The following topics will be covered in this course: Introduction to Statistics, Descriptive Statistics, Statistics in decision making, Graphical representation of Data Stem-and Lead plot, Box- Cox plots, Histograms and Ogive, measures of central tendencies, dispersion for grouped and ungrouped Data, Moments of frequency distribution; examples with real life, use of Elementary statistical packages for explanatory Data analysis. Counting techniques, definition of probability with classical and relative frequency, subjective approaches, sample space, events, laws of probability. General Probability Distributions, Conditional probability, Bayes theorem with application to Random variable (Discrete and continuous) Binomial, Poisson, Geometric, Negative Binomial Distributions, Exponential Gamma and Normal distributions, Regression and Correlation.

Prerequisites

None

Text Book

Walpole, *Introduction to Statistics*, Prentice Hall, 1982, ISBN: 0024241504.

Reference Material:

- G. Cowan G, *Statistical Data Analysis*, Clarendon, Oxford, 1998, ISBN13: 9780198501558
- Mariano R, *Advances in Statistical Analysis and Statistical Computing III*, JAI Press, Greenwich, Conn, 1993