Course Contents for Subjects with Code: IT

This document only contains details of courses having code **IT**.

Code	Subject Title	Cr. Hrs	Semester
IT-101	Introduction to Computing	3	I
Year	Discipline		
1	Information Technology		

Objectives

In today's information age, computers are used in almost each and every aspect of human life: from cell phones to cruise missiles, from disease diagnostics to design of space ships, etc. Objective of this course is to get a breadth-first overview of computing and information technology, and to make students productive with widely used software applications and the World-Wide Web (WWW). The following topics will be covered in the course: The Information Age, Computer Hardware, Introduction to Internet Explorer, Software, Central Processing Unit, Introduction to Microsoft Office, Input & Output, Storage & Multimedia, Microsoft Word, Computer Networks, The Internet, Spreadsheets & Business Graphics, Programming Languages, Software Engineering, Management Information Systems, Artificial Intelligence, Microsoft Excel, Database Management Systems, Microsoft Access, Microsoft Power Point, Introduction to Web Development, Introduction to HTML, Images & Links, Lists and Tables, Forms, Maps and Frames, Introduction to Microsoft FrontPage, Introduction to JavaScript, E-commerce, Security, Privacy and Cyber-Ethics, Introduction to Programming, Algorithms & Flowcharts, Variables & Data Types, Operators & Precedence, Conditional Statements, Loops, Functions, Arrays, HTML Tabular Data Control, New hardware/software technologies.

Prerequisites

None

Text Book

Capron, *Computers – Tools for an Information Age*, Sixth Edition, Prentice Hall, ISBN-10: 0131405640

Deitel, *Internet & World Wide Web – How to Program,* Prentice Hall, ISBN-10: 0131405640

Reference Books
- Brookshear; *Computer Science – An Overview*; Addison-Wesley, ISBN-10: 0201781301
- Sanders; *Computers Today*; McGraw Hill, ISBN 9780070547018

Code	Subject Title	Cr. Hrs	Semester
IT-102	Programming Fundamentals	3	II
Year	Discipline		
1	Information Technology		

Objective

Computer programming is an art of developing computational solutions to precisely describable problems. The purpose of this course is to introduce students with basic concepts of structured programming. After completing this course, they should be able to write elegant structured programs to solve different computational problems. Programs are demonstrated using the C++ programming language. However, the concepts are taught in a language-independent fashion. Note that the basic purpose of this course is to learn programming instead of a particular programming language. The following topics will be covered in this course: Introduction to Programming Languages and Compilers; Flowcharts, Pseudo-code; Data Storage; Introduction to C++, Classes, Objects, and UML; Control Statements; Functions and Recursion; Debugging; Command Line Arguments; Preprocessor; Arrays; Pointers and Pointer-Based Strings; File Processing; Structures and Unions; Self-Referential Classes.

Prerequisites

CS100 / IT 100 – Introduction to Computing

Text Book

- Deitel & Deitel, *C++ - How to Program 5th Edition*, Pearson – Prentice Hall (2005), ISBN:
  0130384747

Reference Books

- Walter Savitch, *Problem Solving with C++: The Object of Programming*, Addison-Wesley, ISBN-10: 0321268652
- Robert Lafore, *Object-Oriented Programming in C++,* ISBN-10: 0672323087

Code	Subject Title	Cr. Hrs	Semester
IT-103	Programming Fundamentals Lab	1	II
Year	Discipline		
1	Information Technology		

Relevant to the above topics

Code	Subject Title	Cr. Hrs	Semester
IT-104	Digital Logic Design	3	II
Year	Discipline		
1	Information Technology		

Objective

The primary objective of the course is to develop in students a thorough understanding of digital logic design principles. The following topics will be covered in the course: Number Systems, Codes (Parallel/Serial), Logic Gates, Boolean Algebra, Boolean Algebra, Positive/Negative Logic, Boolean Algebra (Dual/De-Morgan), Algebraic simplification, Combinational Logic, Truth Tables, Min/Max terms, Combinational Logic, K-Maps, Don't Cares, Multiple outputs, Combinational Logic, 5-6 K-Maps, Combinational Logic Design Practices, Negative numbers, Addition, multiplication, parity, decoders, Encoder, Multiplexor /Demux, Hazards, Tristate, Latches & Flip Flops, *Counters / Registers, Synchronous Counters,* Sequential Logic Design Principles (Wakerly), Mealy / Moore Design—Sequential Circuits—(Wakerly), *ROMS, SRAMS, DRAMS, Memory Organization,* ADC / DAC Interf Analog World, Digital Electronics, Characteristics, Parameters, *Digital Electronics, Logic Families, TTL, CMOS, BiCMOS, ECL, Low-Voltage Logic, Open/Tristate Wired Logic, Bus Tnterface Logic, Mixing CMOS/TTL*

Prerequisites

None

Text Book

M. Morris Mano, *Digital Design*, 3rd Edition, Pearson Education, 2004

Reference Books

T. L. Floyd, *Digital Fundamentals*, Prentice Hall, 8th Edition, 2002

Code	Subject Title	Cr. Hrs	Semester
IT-105	Digital Logic Design Lab	1	II
Year	Discipline		
1	Information Technology		

Objective

The primary objective of the course is to give students practice in designing, implementing, and testing simple digital circuits by using simulation tools and actual integrated circuits (ICs). Experiments must cover the use of following digital circuit elements: logic gates (AND, OR, NOT, NAND, NOR), half-adders, full-adders, multiplexers, demultiplexers, decoders, encoders, flip-flops, shift registers, counters, and RAM.

Text Book

Laboratory Manual prepared by the institution.

Code	Subject Title	Cr. Hrs	Semester
IT-201	Object Oriented Programming	3	III
Year	Discipline		
2	Information Technology		

Objectives

The course aims to focus on object-oriented concepts, analysis and software development. The following topics will be covered in the course: Evolution of OO, OO concepts and principles, problem solving in OO paradigm, OO program design process, classes, methods, objects and encapsulation, constructors and destructors, operator and function overloading, virtual functions, derived classes, inheritance and polymorphism, I/O and file processing, exception handling.

Prerequisites

Introduction to Computing, Programming Fundamentals

Text Book

R. Lafore, *Object-Oriented Programming in C++*, 4th Edition, Sams publishing, 2002.

Reference Material

- Deitel and Deitel, *C++: How to Program*, 4/e, Pearson.
- Bruce Eckel, *Thinking in C++*, 2nd Edition, Prentice Hall.
- D.S. Malik, *C++ Programming*, 4th Edition, Thomson, 2008.

Code	Subject Title	Cr. Hrs	Semester
IT-202	Object Oriented Programming Lab	1	III
Year	Discipline		
2	Information Technology		

Relevant to the topics above

Code	Subject Title	Cr. Hrs	Semester
IT-203	Computer Organization and Assembly Language	3	III
Year	Discipline		
2	Information Technology		

Objectives

The main objective of this course is to introduce the organization of computer systems and usage of assembly language for optimization and control. Emphasis should be given to expose the low-level logic employed for problem solving while using assembly language as a tool. The students will be capable to acquire knowledge that is specific to Intel 80x 86 processor families, as well as knowledge that is universal. They will learn the programming methodologies showing how to use Assembly Language for Application Software's, System Programming and Terminate and Stay Resident. They will develop programs based on the interaction between Assembly Language and Operating System, Security Software's, encryption and decryption programs, programs for Reverse Engineering, programs for small scale Embedded Systems and Games specially Networking Games using serial and parallel ports. Following topics will be covered in this course: Processor Architecture and Organization, Memory Architecture, Intel 8086 Registers, Addressing Modes, Memory Addressing, MOV The Basic Instruction, Debugger, Mathematical and Bit wise Logical instruction, Stack Instructions, Interrupts, Memory Models, Practice of Program Writing and Debugging, Control Transfer and Conditional Action Instructions, Procedures, Macros, Shift and Rotate Instructions, Procedures to Input and Display Binary, Decimal, Hexadecimal Numbers, Reading DOS Command Tail, Data Communication, File Handling, Recursion, High–Level Logic Structures, Interfacing of Assembly and C++ , Languages, Storage of Real Numbers, Math co-processor, String instructions, Introduction to Machine Code, Protected Mode, Terminate and Stay Resident Programs, Micro Controller Programming (8051)

Prerequisites

Digital Logic Design

Text Book

Barry B. Brrey, *The Intel Microprocessors 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium and Pentium Pro Processor,* ISBN-10: 0139954082

Kip R. Irvine, *Assembly Language for Intel Based Computers,* Third Edition, 1999, Prentice-Hall Publishing, 1999, ISBN-10: 0132383101

Reference Material

- Assembly Language Reference by Que. Corporation.
- I Scott Mackenzie, *8051 Micro-controller Programming*, 3rd Edition, ISBN-10: 0137800088

Code	Subject Title	Cr. Hrs	Semester
IT-204	Computer Organization and Assembly Language Lab	1	III
Year	Discipline		
2	Information Technology		

Objectives

Instruction set architecture. Accumulator based, Stack Based and General Purpose Register Organization. Processor's Data Path. Design of a basic computer highlighting the timing and control system in instruction execution cycle. Interrupts, traps and signals. Comparison of Intel 80x86 and MIPS architectures. Addressing Modes. Mapping of High level language to corresponding assembly and machine language. Memory and Cache organization techniques. I/O techniques (Memory mapped and isolated I/O). Latest trends in Architectures.

Prerequisites

Digital Logic Design

Text Book

Kip R. Irvine, *Assembly Language for Intel Based Computers,* Third Edition, 1999, Prentice-Hall Publishing, 1999, ISBN-10: 0132383101

Reference Material

- Assembly Language Reference by Que. Corporation.

Code	Subject Title	Cr. Hrs	Semester
IT-205	Web Engineering	3	IV
Year	Discipline		
2	Information Technology		

Objectives

This course provides an introduction to the theory and implementation of interactive client side and server side Web programming. The course will begin with Markup languages, Cascading Style sheets, JavaScript and move on to interfacing them with server side programming. The major focus of the course will be on server side dynamic web application development using Java Server Pages and Servlets technology. This course covers design, development and deployment of dynamic and interactive web applications. The following topics will be covered in this course: Overview of markup languages including XML, cascading style sheets (CSS), clients side scripting languages (Java Scripting), web application designing, web application architecture, http client request and http server response, web application n-tier architecture and layered architecture, server side programming using JSP and Servlets, Servlets and JSP overview, handling client request, http request headers, generating the dynamic sever response, http status codes, http response headers, session tracking, handling cookies, implementing session tracking, understanding session tracking API, encoding URLs, implementing a shopping cart, server side include, redirection, servlet chaining, JSP scripting elements, JSP directives, including files and applets in JSP pages, using Java Beans components in JSP pages, comparison of JSP and Servlets, MVC architecture, integrating servlets and JSP, JSP expression language. This course also includes overview of different frameworks and technologies used in web applications development: AJAX, Hibernate, Struts, and Java Server Faces.

Prerequisites

HTML, Java Programming, Object Oriented Programming

Text Book
XML How to Program by Deitel
JavaScript by Wrox
Core Servlets and Java Server Pages by Marty Hall (Sun Microsystems)

Reference Books
- Professional Java Server Programming by Wrox
- Ivan Bayross, *JavaScript, Perl, CGI*, BPB Publications
- http://www.w3c.org/
- http://www.w3schools.com/
- http://www.coreservlets.com/
- http://courses.coreservlets.com/Course-Materials/csajsp2.html
- http://courses.coreservlets.com/Course-Materials/scwcd.html
- http://courses.coreservlets.com/Course-Materials/msajsp.html
- http://www.coreservlets.com/JSF-Tutorial/
- http://courses.coreservlets.com/Course-Materials/ajax.html
- http://courses.coreservlets.com/Course-Materials/struts.html
- http://courses.coreservlets.com/Course-Materials/java5.html

- http://java.sun.com/
- http://www.theserverside.com/
- http://java.sun.com/docs/books/tutorial

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

Reference Material

- Ian Sommerville, *Software Engineering,* 6th Edition ISBN-10: 020139815X

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

Code	Subject Title	Cr. Hrs	Semester
IT-208	Data Structure and Algorithm Lab	1	IV

Year	Discipline
2	Information Technology

Relevant to the topics above

Code	Subject Title	Cr. Hrs	Semester
IT-301	Theory of Automata (IT)	3	V

Year	Discipline
3	Information Technology

Objectives

Formal language, Defining Language, Regular Expression, Finite Automata, Transition Graphs, Kleene's Theorem, Finite Automata with output, Regular Languages, Non regular Languages, Decidability, Demonstration Of JFLAP, Context Free Grammars, Grammatical Format, Pushdown Automata (PDA), CFG=PDA, Non-Context-Free Languages, Context-Free Languages, Decidability, Turing Machine, The Chomsky Hierarchy

Prerequisites

Discrete Mathematics

Text Book

Daniel I. A. Cohen "Introduction To Computer Theory", 2nd Edition John Wiley, ISBN 0-471-13772-3, 1996

Reference Books

- John C. Martin "Introduction to Languages and The Theory of Computation", 2nd Edition McGraw Hill, ISBN 0070408459, 1997
- John E. Hopcroft, Rajeev Motwani and Jeffrey D. Ullman "Introduction to Automata Theory, Languages, and Computation", 2nd Edition Addison-Wesley, ISBN 0201441241, 2000
- Harry R. Lewis and Christos H. Papadimitriou "Elements of Theory of Computation", 2nd Edition Prentice Hall, ISBN 0132624788, 1997

Code	Subject Title	Cr. Hrs	Semester
IT-302	Principles of Management (SS)	3	V

Year	Discipline
3	Information Technology

Objectives

This course provides the fundamental knowledge of Management. The following topics will be covered in the course: Managers and Management, The Evolution of Management, Managerial Environment, Decision Making, Planning, Strategic Management, Organizing, Human Resource Management, Motivation, Leading, Controlling, Quality, Productivity and Customer Satisfaction and Case Studies.

Prerequisites

None

Text Book

Robins Stephen, *Management*

Reference Books

- Griffen, *Principle of Management*

Code	Subject Title	Cr. Hrs	Semester
IT-303	Introduction to Philosophy (HM)	3	V

Year	Discipline
3	Information Technology

Objectives

Definition of the word Philosophy, Nature application of philosophy, Branches of philosophy that involve in the root knowledge, culture, society, science and religions. History of philosophy (Greek: Muslim age, Modern age, Muslim Philosophy, difference between Theology , Muslim Philosophy. Some metaphysical problems, Existence of God, Freedom of and life after death. Muslim Philosophers, AL KINDI, IMAM GHAZALI, IBN KHULDUN. Critical and analytical thinking and its importance for self development learning process and problem solving. Epistemology, Sources of Knowledge, re-empiricism, intuition, revelation, environment, media, and other sources. Ethics, day marketing, role of ethic of peace and prosperity. Ethics of computer, computer crime, cyber stalking. Philosophy of computer science, science and its importance, computing; computer science is a science or another field. Artificial intelligence difference between human mind and computer memory. Cyber philosophy, human machine interaction, impacts of computing on society and organization. Philosophy Religion: Conflict of different ways of religious life, relation between philosophy religion, reason and revelation, difference between them, relation between the General Philosophical view, Globalization and its importance, importance of culture and society, culture and society is necessary for restless person. Formal logic, valid and invalid arguments, premises, conclusion and fallacies.

Prerequisites

None

Text Books

- Elements of philosophy By Dr. Naeem Ahmad
- Introduction to philosophical analysis by Hosper John
- History of Western Philosophy by Bertrand Russell
- Muslim Philosophy by Muhammad Ashraf

Code	Subject Title	Cr. Hrs	Semester
IT-304	Database Systems (CMP)	3	V
Year	Discipline		
3	Information Technology		

Objectives

The course aims to introduce basic database concepts, different data models, data storage and retrieval techniques and database design techniques. The course primarily focuses on relational data model and DBMS concepts. The following topics will be covered in the course: Traditional File Based Systems, Roles in Database Environment, ANSI-SPARC Architecture, Data Manipulation Language (DML), Data Models, Multi-User DBMS Architectures, Relational Data Structures, Database Schemas, Relational Integrity, Introduction to SQL, Data Manipulation, Creating a Database, Tables, Index, Views, Transactions, Database Application Life Cycle, Database Planning, Database Design, Data Administration & Database Administration, Entity Types, Relationship Types, Structural Constrains, Problems with ER Models, Specialization/Generalization For EERD, Anomalies, Functional Dependency, Process of Normalization, Database Design Methodology, Database Security, Client Server Architecture, Centralized and Distributed Databases, Advance Topics.

Prerequisites

Data Structures and Algorithms

Text Book

C.J.Date, *Database Systems,* Addison Wesley Publications Co., 2004. ISBN-10: 0321197844

Reference Material

- R.Connolly and P.Begg, *Database Systems: A Practical Approach to Design, Implementation and Management,* Addison-Wesley Publications Company, 2003. ISBN-10: 0201342871
- Elmasri and Navathe, *Fundamentals of Database Systems*, 3/E, Addison-Wesley, ISBN: 0201741539

Code	Subject Title	Cr. Hrs	Semester
IT-305	Database Systems Lab (CMP)	1	V
Year	Discipline		
3	Information Technology		

Relevant to the above topics

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-307	Object Oriented Analysis and Design (ICS)	3	V
Year	Discipline		
3	Information Technology		

Objectives

The objective of this course is to demonstrate knowledge and understanding of essential facts, concepts, principles, and theories relating to computer science and software applications. It involves the applications of object-oriented concepts and to identify and analyze criteria and specifications appropriate to specific object oriented problems, and plan strategies for their solution. The following topics will be covered in the course: Introduction to Object Oriented Concepts, Object-Oriented Analysis and Design, Linear and Iterative Process Models, Requirement Engineering utilizing Object-Oriented Techniques, Software Design and Architectures, Object-Oriented Design, UML modeling, Use-Case Modeling, Domain Modeling, Interaction Diagrams, Design Modeling, and Implementation Modeling; Design Patterns (GRASP), User Interface Design, Usage of Rational Rose, Object-Oriented Testing, Object-Oriented Metrics, Component Based Development, Reusability.

Prerequisites

Software Engineering

Text Book

Stephan Schach, Irwin, *Object-Oriented Software Engineering,* 1999. ISBN: 0072418729
Craig Larman, *Applying UML and Patterns*, 2002. ISBN-10: 0130925691

Reference Material

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

Code	Subject Title	Cr. Hrs	Semester
IT-308	Internet Programming (IT)	3	VI

Year	Discipline
3	Information Technology

Objectives

Introduction: Introduction to course, introduction to HTML, text formatting, HTML tables and forms, introduction to cascading style sheets, introduction to client-side scripting, functions, arrays and event handling in java script, introduction to java, classes, packages and interfaces, java exception handling and multithreading. I/O operations, concepts of streams, developing graphical user interface using java, java event handling, communicating with databases(JDBC), introduction to client/server architecture, concept of sockets, different ways of client server communication, introduction to distributed computing, Remote method invocation, introduction to java applets, introduction to server-side programming, introduction to java servlets, concept of data persistency, introduction to java server pages, introduction to java beans.

Prerequisites

Object Oriented Programming

Text Book

Java 2, How to Program, Deitel, Deitel & Neito.

Reference Books

- Java 2 Complete Reference
- Core Servlets and Java Server Pages
- Java Network Programming (oreilly series)
- Professional JSP (by wrox series)

Code	Subject Title	Cr. Hrs	Semester
IT-309	Computer Networks (CMP)	3	VI

Year	Discipline
3	Information Technology

Objectives

The aim of this course is to introduce students to the basic concept of computer networks and communication. It will provide a detailed overview of the Network models (OSI, TCP/IP) and Protocol Standards. Emphasis will be given on the understanding of modern network concepts. The following topics will be covered in the course: Analogue and digital Transmission, Noise, Media, Encoding, Asynchronous and Synchronous transmission, Protocol design issues, Network system architectures (OSI, TCP/IP), Error Control, Flow Control, Data Link Protocols (HDLC, PPP), Local Area Networks and MAC Layer protocols (Ethernet, Token ring), Multiplexing, Switched and IP Networks, Internetworking, Routing, Bridging, Transport layer protocols TCP/IP, UDP, Network security issues, Programming exercises or projects involving implementation of protocols at different layers.

Prerequisites

Operating Systems

Text Book

Tanenbaum, *Introduction to Computer Networks,* ISBN-10: 0-13-066102-3

Reference Material

- Richard Stevens, *Unix Network Programming,* ISBN-10: 013490012X
- Larry Peterson, Bruce Davie, *Computer networks: a systems approach*, Princeton Univ., Princeton. ISBN-10: 1558605142
- James F Kurose, Keith W Ross, *Computer Networking: A Top-Down Approach Featuring the Internet*, 2/e, Addison Wesley 2003. ISBN: 0-201-97699-4.

Code	Subject Title	Cr. Hrs	Semester
IT-310	Computer Networks Lab (CMP)	1	VI

Year	Discipline
3	Information Technology

Objectives

The aim of Computer Networks Lab is to provide a hands-on experience to the students so that they can confidently cope with the practical issues/problems in Computer Networks. The following topics will be covered in this course: Hardware Components, PC Hardware, Laboratory Safety and Tools, Hardware Assembling, Portable Devices, Adding a Network Interface Card (NIC), TCP/IP Utilities, Connecting a Printer, Sharing a Printer, Managing a Printer, Dealing with paper problems, Layer 2 Internetworking Devices, Switch configuration, Media and Design (Topology Design), Structured Cabling (Straight-Through Cable, Crossover Cable, Rollover Cable), Using the Router, Router Components, Router Startup and Setup, Router Configuration, Operating System Installation, Implementing a small LAN.

Prerequisites
None

Text Book
Lab Manual provided by instructor

Reference Material
None

Code	Subject Title	Cr. Hrs	Semester
IT-311	Information Systems (IT)	3	VI

Year	Discipline
3	Information Technology

Objectives

Today, more than ever, there is a pressing need for information systems that effectively support the strategic objectives of the organization. Consequently, the individuals creating and managing such systems have to be much more familiar with the business aspect of their organization than was necessary in the past. Focus on management skills and knowledge required to make efficient use of information in the organization. Learn about significant aspects of both business management and information systems knowledge. Understand how to specify, develop and manage information systems as a strategic organizational resource. This program is geared for the business professional seeking an understanding of information management. The following topics will be covered in this course: Introduction, Information Systems, Strategic Management and Performance Evolution, Developing and Implementing change Programs, Organization and Management Issues.

Prerequisites

None

Text Book

Managing Information Systems: An Organisational Perspective, 2nd Edition, Prentice Hall, 2004.

Reference Books

- K.C. Laudon. and J.P. Laudon, *Essentials of Management Information Systems*, Prentice Hall, 1995
- K.C. Laudon. and J.P. Laudon, *Management Information Systems: Organizations and Technology,* 3rd Edition, Macmillan, 1991

Code	Subject Title	Cr. Hrs	Semester
IT-312	Linear Algebra (MA)	3	VI
Year	Discipline		
3	Information Technology		

Objective

The purpose of this course is to provide a solid foundation in Linear Algebra. It will enable the students to master the concepts and to know when and how to apply linear algebra. Applications are taken from such areas as Cryptography, Fractals, Chaos, Computer Graphics, Game of Strategy, Computer Tomography, Warps and Morphs. The Software MATLAB will be used for the implementation of Linear Algebra. The following topics will be covered in this course: Introduction to Linear Algebra (History, differentiation between Matrix Algebra and Linear Algebra), Concept of a matrix with real entries, Operations of matrices (Addition, multiplication, scalar multiplication, trace, transpose), Determinant of a matrix and its properties. Singular and non-singular matrices, Row/Column elementary Operations defined on a matrix Inversion of a matrix (by elementary operations), Reduction of matrix into echelon and reduced echelon form by elementary operations. Rank of a matrix, Introduction to system of linear equations, Solution of system of linear equations by Gauss elimination method, Concept of algebraic Structures (Semi group, Group, abelian group), Sub groups, Cosets, Mappings, Ring and Field, Introduction to vector spaces, Linear combination, linear span, Linear dependence and independence of vectors, Concept of basis and dimension, Linear transformations, Kernel and Range, Matrix representations of a linear transformation, Matrix transformations (dilation, contraction, reflection, compressions and expansion), Affine Transformations (Shearing, Scaling, Rotation, and Translations), Concepts of eigenvalue and eigenvector, Characteristic equation, Eigenvalues of an upper & lower triangular matrix, Diagonalization of matrices, Matrix Functions, Concepts of Norm and inner product space.

Prerequisites

Calculus – II

Text Book

Anton - Rorres "Elementary Linear Algebra, application version". 8th Edition, John Wiley & Sons, Inc. 2000, ISBN: 978-0-471-44902-7

Reference Material

- David C Lay, Linear Algebra, Pearson Addison Wesley, 1999, ISBN: 0201660369

Code	Subject Title	Cr. Hrs	Semester
IT-313	Introduction to Psychology (HM)	3	VI
Year	Discipline		
3	Information Technology		

Objectives

Intro to Psychology, Definition of the term Psychology; Origin, Back ground, Psychology and Soul; Development of Psychology as independent science; Relationship of Psychology with Philosophy and deep roots of Psychology in Philosophy; Differentiate between Psychologists, Psycho analyst and Psychiatrist; Different school of thought in Psychology, Structuralism Functionalism; Different school of thought in Psychology; An overview of important methods in Psychology, Observational method, Clinical method, Development method, Introspection method; Different branches of Psychology: Child Psychology, Clinical Psychology, Applied Psychology; Individual Psychology, Criminal Psychology; Position of Sigmund Freud as the father of modern Psychology, Conscious/Unconscious/Subconscious; Psychodynamic theories: ID, Ego, Super Ego; Memory: What is memory, Differentiate between STM and LTM; Forgetting: What is Forgetting, Causes of Forgetting; Disorders: Sleep and Behavioral disorders; Overview of composite Psychology; Perception, What is Perception; Various processes in Perception; Perception and its various characteristics; Attention, Attention as selective process; Internal and External determinants of attention; Intelligence and Intelligence test; Artificial Intelligence: Computer in any case cannot replace human mind; Cognitive Psychology: Learning; Various process and methods of leaning; Nervous System: Definition and part; Types of Nerves, Mental Processes, Brain Sensation: Types of Sensation; Personality and its Structure; Development: Basis and factors of Development; Social Psychology, Social Cognition, Impression Formation; Dream: Nature Of Dream, Dream as Supernatural Phenomena; Revision

Prerequisites

None

Text Books
- Element of Psychology by Karamat Hussain
- Psychology by Don Baucum
- World of Psychology by Samuel E. Wood, Ellen Green Wood, Denise A. Boyd

Code	Subject Title	Cr. Hrs	Semester
IT-314	Introduction to Sociology (SS)	3	VI
Year	Discipline		
3	Information Technology		

Objectives

Introduction to Sociology, Sociology as a social science; History of Sociology; Advantages of Sociology; Types of Major perspectives in Sociology: Functionalist, Conflict, Internationalist, Theoretical; Ibne Khuldun, Laws of Sociology; Shah Wali Ullah, Evolution of society, Stages of human society; Contribution of Auguste Comte and Spencer in the development of Sociology; Sociology and other social sciences: Sociology and History, Sociology and Political science, Sociology and Economics, Sociology and Philosophy; Socialization and its importance; Concepts and views about socialization; Processes and agents of Socialization; Different types of socialization: Primary, Developmental, Anticipatory, Reconciliation; Elements and types of social interaction: Cooperation, Competition, Conflict, Accommodation; Overview of composite Sociology; Social institution: Family, Marriage, Kinship; Social research its method and techniques; What is Research? Its definition; Method of social research: Observation, Interview, Social survey, Questionnaire; Culture and Society: Definition, Characteristic Cultural contents (Material and Non-material); Basic elements of culture: Cognitive elements, Beliefs, Norms and Values; Ethics and its meaning, Can ethics play an important role for peace and prosperity; Social norms, Sanction, Belief, and Religion; Some basic concepts about Society, Community, Association; Difference between society and community; Social disorganization: The concepts of social disorganization, Population, Street crimes, Poverty, Unemployment; Critical and analytical thinking, its importance for learning process, personality development, Reaching conclusion; Power, Status, and Authority, Types of Authority and status.

Prerequisites

None

Text Books
- An Introduction to Sociology by Richard T. Schefer
- An Overview of Sociology by John Maconauis
- History of Sociology by Paul B. Harton

Reference Books
- Kakas John "The Nature of Sociology"
- Allama Iqbal "Reconstruction of religious thought in Islam"
- Hick John "Introduction to Sociology"

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*.

Recommended Books:

- Kauffels, F-J, Network Management, Addison Wesley, 1992
- Steven Karris, Networks: Design and Management, Orchard Publications, 2002.
- Teresa C. Piliouras, Network Design: Management and Technical Perspectives, Auerbach Publications; 2nd Edition, 2004.
- Arne Mikalsen, Per Borgesen, Local Area Network Management, Design & security, John Wiley & Sons, 1st Edition, 2002.
- Ball, L.A., Cost-Effective Network Management, McGraw-Hill, 1992
- Stallings, W., Network Management, IEEE Tutorial 1993
- John Blommers, OpenView Network Node Manager: Designing and Implementing an Enterprise Solution
- Priscilla Oppenheimer, Joseph Bardwell, Troubleshooting Campus Networks: Practical Analysis of Cisco and LAN Protocols Clare Gough, Building Scalable Cisco Inter networks (BSCI).

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-403	**Database Administration**	**3**	**VII**
Year	Discipline		
4	**Information Technology**		

Course Contents:

Introduction to Enterprise Database Systems, Oracle Architectural Components: What is Introduction to Enterprise Database Systems, Responsibilities of Database Administrator. **Oracle Architectural Components**: Oracle Server; Oracle Instance; Physical Structure. **Creating Database and Data dictionary**: Creation Prerequisites; Creating Database; Starting Instance; Data Dictionary; Data Dictionary Contents; Dynamic Performance Views. **Managing Control Files and Redo Log Files**: Control File; Control File Contents; Multiplexing Control File; Using Redo Log Files; Structure of Redo Log File; Adding Redo Log Groups and Members; s. **Managing Tablespaces**: Database Storage Hierarchy; Kinds of Tablespaces; **Managing Data files, Storage Structure and Relationships**: Adding Data files and other Operations with Data files; Types of Segments; **Managing Undo Data**: Undo Segment; Read Consistency; Automatic undo Management;: **Managing Tables, Managing Users**: Creating Users; Managing Users; Creating Tables; Managing Tables. **Managing Indexes**: types of Indexes; Creation and Management of Indexes. **Maintaining Data Integrity**: Types of Constraints; Managing Constraints. **Managing Privileges**: System Privileges; Object Privileges. **Managing Roles**: Assign and Revoke Roles and Roles Management. **Network overview,** Configuring Listener; Sessions. **Client Side Configuration**: Host Naming Method; Local Naming Method; Net Assistant; Configurations of Different Methods. **Usage and Configuration of Oracle Shared Server**: Server Configuration; Dedicated Server Process; Shared Server Process;. **Backup and Recovery overview, Instance and Media Recovery**: Categories of Failure; Defining Backup and Recovery Strategy;. **Configuration of Archive log mode**: Switching to Archive Log Mode; Archive Process. **User Managed Backups**: User Managed backups and Issues. **User Managed Complete Recovery**: How To recover a Database Manually Using Manual Backups. **User Managed Incomplete Recovery**: How to DO an Incomplete Recovery. **Import/Export**: Different export and import modes.

Recommended Books:

- Oracle 9i DBA Fundamentals I (Student Guide, Volume I and II).
- Oracle 9i DBA Fundamentals II (Student Guide, Volume I and II).
- Performance Tuning (Student Guide, Volume I and II).
- Oracle Magazine
- Online Material URL http://otn.oracle.com

Code	Subject Title	Cr. Hrs	Semester
IT-404	**Project Management**	**3**	**VII**
Year	Discipline		
4	**Information Technology**		

Objective:

This course will enable students to initiate software projects, perform project scheduling, plan the resources, carry out the staffing, track the progress, apply software metrics, manage and motivate the team, and manage the crisis situation. The following topics will be covered in the course: Introduction to Project Management, Project Phases and Project Life Cycle, Project Integration Management, Project Scope Management, Project Estimation, Size and Schedule Management, Activity Control, Schedule Development, Controlling Changes to the Project Schedule, Project Cost Management, Resource Planning, Cost Budgeting, Cost Control, Project Human Resource Management, Organizational Planning, Project Staff Acquisition, Team Development, Project Risk Management, Quantitative and Qualitative Risk Analysis, Current and Prevailing Practices, Software Configuration Management, Project Monitoring and Control, Project Quality Management, Software release Management, Process improvement frameworks.

Prerequisites

Software Engineering

Recommended Books:

- Kathy Schwable, IT Project Management, Course Technology; 3rd Bk&Cdr edition (July 2003), ISBN-10: 0619159847
- Robert K. Wysoki, Effective Project Management, Wiley; 2nd Bk&Cdr edition (March 2, 2000), ISBN-10: 0471360287
- Punkaj Jalote, Software Project Management, Addison-Wesley Professional; 1st edition (January 31, 2002), ISBN-10: 0201737213
- Roger S. Pressman, Software Engineering- A practitioner's approach, 5th Edition, ISBN 9780073019338
- Robert Futrell, Quality Software Project Management Prentice Hall PTR; 1st edition (2002), ISBN-10: 0130912972

Code	Subject Title	Cr. Hrs	Semester
IT- 405	**Capstone Project-I**	**3**	**VII**
Year	Discipline		
4	**Information Technology**		

Objectives:

The software project involves research, conceive, plan and develop a real and substantial project related to computer science. It provides an opportunity to the students to crystallize their acquired professional competence in the form of a demonstrable software product. Make oral and written project presentations.

Prerequisites

Software Engineering – I, Data Base Systems, Computer Architecture

Resources

- Jalote, Pankaj, *Software Project Management in Practice*.

Recommended Books:

BS (4 Years) for Affiliated Colleges

Code	Subject Title	Cr. Hrs	Semester
IT-406	**Network Security**	**3**	**VIII**
Year	Discipline		
4	**Information Technology**		

Objectives:

Overview of the Network, Security threats and security mechanisms, Intro to cryptography, Classical symmetric encryption techniques, Block ciphers, DES and Triple DES, Overview of recent encryption algorithms, Application of symmetric encryption, Confidentiality, Finding prime factors (number theory), Public key (asymmetric) cryptography, RSA, Key Distribution and Management, Message authentication, hash functions, Digital signatures and authentication protocols, Kerberos, Electronic mail security, IP Security, Web security, SSL, TLS, Intrusion detection, Malicious software, Viruses and worms, Firewalls

Prerequisites

Recommended Books:

- Network security and cryptography , Prentice Hall, William Stallings , 2003
- Networks perimeter security by Cliff Rigs
- Network Security by Eric Maiwald
- Biometrics for network security by Paul Reid, 2004
- Computer security basics by rick lehtinen, D. Russell, 2006

Code	Subject Title	Cr. Hrs	Semester
IT-407	**Software Quality Assurance**	**3**	**VIII**
Year	Discipline		
4	**Political Science**		

Objective:

The objective of this course is to study in detail the issues involved in software quality engineering. The course focuses on current practice, research and trends in Quality. The following topics will be covered in the course: Introduction to Software Quality Assurance, Software Quality in Business Context, Quality Assurance in Software Support Projects, Product Quality and Process Quality, Models for Software Product Quality, Hierarchal Quality Model, Factor Criteria Metrics model (FCM), McCall's Model, Boehm's Model , FURP Model, ISO 9126 Model, Dromey's Quality Model, QMOOD, SATC's Quality Model , Non Hierarchal Models, Bayesian Belief Model, Star Model, CMM, Software Metrics, Defect Metrics, Reliability Metrics, GQM, Introduction to Testing, Software Testing Principles, Test Planning, Measurement, Execution, and Reporting, Software Testing Techniques, White Box Testing, Black Box Testing, Software Testing Strategies, Regression Testing, Alpha Testing, Beta Testing, Integration Testing, Bottom-Up Integration Testing, Verification and Validation, Unit Testing, Integration Testing, Validation Testing, System Testing, Recovery Testing, Security Testing, Performance Testing, Stress Testing, Review Techniques.

Prerequisites
None

Recommended Books:

- Nina S Godbole, Software Quality Assurance, Alpha Science International, Ltd (2004), ISBN-10: 1842651765
- R A Khan, K Mustafa, SI Ahson, Software Quality, Concepts and Practices, ISBN: 81-7319-722-9
- Srinivasan Desikan, Gopalaswamy Ramesh, Software Testing Principals and Practices, ISBN: 81-7758-121-X
- Stephen H. Kan, Metrics and Models in Software Quality Engineering, Second Edition, ISBN: 81-297-0175-8
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Code	Subject Title	Cr. Hrs	Semester
IT-408	**Introduction to Economics**	**3**	**VIII**
Year	Discipline		
4	**Information Technology**		

Objective:

This course aims at introducing the basic concepts of micro and macroeconomics and their practical importance. This course gives the students an overview of issues confronted by economists in the policy side as well. It would also build deeper understanding of the students about working of an open economy. The following topics will be covered in the course: Nature and scope of economics, theory of consumer behavior, theory of demand, theory of supply, price determination, elasticity of demand, price elasticity of supply, production cost, perfect competition, monopoly, monopolistic competition, oligopoly, national accounting, national income application-standard of living, Keynes theory of income and employment, inflation, unemployment, role of government-fiscal policy, central bank-monetary policy, global economics, free trade and protection.

Prerequisites
None

Recommended Books:

- McConnell and Brue, Economics, ed. 17. ISBN: 978-0073126630
- Roger Leroy Miller, Economics Today, ed. 16. ISBN: 978-0132554619

Code	Subject Title	Cr. Hrs	Semester
IT-409	**Capstone Project -II**	**3**	**VIII**
Year	Discipline		
4	**Information Technology**		

Objectives:

The software project involves research, conceive, plan and develop a real and substantial project related to computer science. It provides an opportunity to the students to crystallize their acquired professional competence in the form of a demonstrable software product. Make oral and written project presentations.

Prerequisites

Software Engineering – I, Data Base Systems, Computer Architecture

Resources

- Jalote, Pankaj, *Software Project Management in Practice*.

Recommended Books: