Course Contents for Subjects with Code: IT

This document only contains details of courses having code IT.
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

Reference Books
- Brooksheath; *Computer Science – An Overview*, Addison-Wesley, ISBN-10: 0201781301
### 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


### Reference Books


### Table

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<th>Cr. Hrs</th>
<th>Semester</th>
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<tr>
<td>IT-102</td>
<td>Programming Fundamentals</td>
<td>3</td>
<td>II</td>
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<td>Year</td>
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<td>Information Technology</td>
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Relevant to the above topics
### 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 Interface Logic, Mixing CMOS/TTL

### Prerequisites
None

### Text Book

### Reference Books

### 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), halfadders, full-adders, multiplexers, demultiplexers, decoders, encoders, flip-flops, shift registers, counters, and RAM.

### Text Book
*Laboratory Manual prepared by the institution.*
**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**


**Reference Material**

- Deitel and Deitel, *C++: How to Program, 4/e*, Pearson.

**Relevant to the topics above**
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

Reference Material
- Assembly Language Reference by Que. Corporation.
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<td>IT-204</td>
<td>Computer Organization and Assembly Language Lab</td>
<td>1</td>
<td>III</td>
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### Objectives

### Prerequisites
Digital Logic Design

### Text Book

### Reference Material
- Assembly Language Reference by Que. Corporation.
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 server 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.w3.org/
- http://www.w3schools.com/
- http://www.coreservlets.com/
BS (4 Years) for Affiliated Colleges

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

Prerequisites
Databases

Text Book

Reference Material
BS (4 Years) for Affiliated Colleges

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<td>IT-207</td>
<td>Data Structure and Algorithm</td>
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<td>IV</td>
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**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**

**Reference Material**
BS (4 Years) for Affiliated Colleges

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Relevant to the topics above
BS (4 Years) for Affiliated Colleges

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<td>IT-301</td>
<td>Theory of Automata (IT)</td>
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**Year**

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<td>Information Technology</td>
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**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**


**Reference Books**

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
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
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

Reference Material

Relevant to the above topics
### 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

### Reference Material
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

Reference Material
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<td>IT-308</td>
<td>Internet Programming (IT)</td>
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<tbody>
<tr>
<td>3</td>
<td>Information Technology</td>
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</table>

**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)
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

Reference Material
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
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

Reference Books
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

Reference Material
Objectives
Intro to Psychology, Definition of the term Psychology; Origin, Background, 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
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 Maconuais
- 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”
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.
- 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).
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

Recommended Books:
- Floyd Marinescu, EJB design patterns.
- http://www.javaworld.com
- http://www.serverside.com
- http://www.jeeoeplumus.com
- http://www.bea.com
- http://www.onjava.com
- http://www.javaskyline.com
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 Tables:** Database Storage Hierarchy; Kinds of Tables; **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
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<th>Subject Title</th>
<th>Cr. Hrs</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT-404</td>
<td>Project Management</td>
<td>3</td>
<td>VII</td>
</tr>
<tr>
<td>Year</td>
<td>Discipline</td>
<td></td>
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<tr>
<td>4</td>
<td>Information Technology</td>
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</tbody>
</table>

**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
## BS (4 Years) for Affiliated Colleges

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject Title</th>
<th>Cr. Hrs</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT-405</td>
<td>Capstone Project-I</td>
<td>3</td>
<td>VII</td>
</tr>
<tr>
<td>Year</td>
<td>Discipline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Information Technology</td>
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</tbody>
</table>

### 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

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<thead>
<tr>
<th>Code</th>
<th>Subject Title</th>
<th>Cr. Hrs</th>
<th>Semester</th>
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<tbody>
<tr>
<td>IT-406</td>
<td>Network Security</td>
<td>3</td>
<td>VIII</td>
</tr>
</tbody>
</table>

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:

- 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
Objective:


Prerequisites

None

Recommended Books:

BS (4 Years) for Affiliated Colleges

<table>
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<tr>
<th>Code</th>
<th>Subject Title</th>
<th>Cr. Hrs</th>
<th>Semester</th>
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</thead>
<tbody>
<tr>
<td>IT-408</td>
<td>Introduction to Economics</td>
<td>3</td>
<td>VIII</td>
</tr>
</tbody>
</table>

**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
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: