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 047113772-3, 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-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-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

③ Griffen, *Principle of Management*