3rd Semester

CSE-2101: Data Structures [3.0 credits, 45 Hours Lecture]

Internal data representation; Abstract data types; Elementary data structures: arrays, lists, stacks, queues, trees, graphs; Advanced data Structures: heaps, Fibonacci heaps, B-trees; Recursion, sorting, searching, hashing, storage management.

CSE-2102: Data Structures Lab. [1.5 credits, 45 Hours Lecture]

Laboratory works based on CSE 2101.

CSE-2103: Digital Logic Design [3.0 credits, 45 Hours Lecture]

Digital logic: Boolean algebra, De Morgan's Theorems, logic gates and their truth tables, canonical forms, combinational logic circuits, minimization techniques; Arithmetic and data handling logic circuits, decoders and encoders, multiplexers and demultiplexers; Combinational circuit design; Flip-flops, race around problems; Counters: asynchronous counters, synchronous counters and their applications; PLA design; Synchronous and asynchronous logic design; State diagram, Mealy and Moore machines; State minimizations and assignments; Pulse mode logic; Fundamental mode design.

CSE-2104: Digital Logic Design Lab. [1.5 credits, 45 Hours Lecture]

Laboratory works based on CSE 2103.

EEE-2105: Electronic Devices and Circuits [3.0 credits, 45 Hours Lecture]

Introduction to semiconductors, p-type and n-type semiconductors; p-n junction diode characteristics; Diode applications: half and full wave rectifiers, clipping and clamping circuits, regulated power supply using zener diode.
Bipolar Junction Transistor (BJT): principle of operation, I-V characteristics; Transistor circuit configurations (CE, CB, CC), BJT biasing, load lines; BJTs at low frequencies; Hybrid model, h parameters, simplified hybrid model; Small-signal analysis of single and multi-stage amplifiers, frequency response of BJT amplifier. Field Effect Transistors (FET): principle of operation of JFET and MOSFET; Depletion and enhancement type NMOS and PMOS; biasing of FETs; Low and high frequency models of FETs, Switching circuits using FETs; Introduction to CMOS.
Operational Amplifiers (OPAMP): linear applications of OPAMPs, gain, input and output impedances, active filters, frequency response and noise. Introduction to feedback, Oscillators, Silicon Controlled Rectifiers (SCR), TRIAC, DIAC and UJT: characteristics and applications; Introduction to IC fabrication processes.

EEE-2106: Electronic Devices and Circuits Lab. [1.5 credits, 45 Hours Lecture]

Laboratory works based on EEE 2105.

CSE-2108: Web Engineering Laboratory [3.0 credits, 90 Hours Lecture]

Introduction to Internet programming. E-commerce, E-Commerce Revolution, Understanding E-commerce Organizing Themes. The

Internet and World Wide Web: E-commerce Infrastructure. E-Commerce System Models and Concepts : B2B, B2C, C2C. The Internet: Technology, background. Building an E-Commerce Application: A systematic approach. Choosing server software. Choosing the hardware for an E-commerce site. E-commerce Application Development: XML and XML parsing Methods, XFORMS and XHTML. Presentation layer Development (Servlet, JSP), Business Logic Layer Development(EJB), Data Layer Development(JDBC), Web Application Design pattern (MVC and other). Personalization, Testing and Debugging, Application to Application communication Protocols: SOAP, WSDL, UDDI, RMI, DCOM, CORBA etc. Security and Encryption: Security, privacy and payment. The E-commerce Security Environment, Security Model. Network-level Security: SSL, Application-level Security. SQL-injection, Form modification, cross site scripting, Privacy: P3P, Policies, Procedures; and Laws. E-commerce Payment Systems. E-Commerce Application infrastructure: J2EE, Net and Web services.

Using three tire MVC model and based on J2EE application Plateform student will be asked to develope E-Commerce (internet application) based projects. Usually a large project will be divided into smaller parts and asked to implement step by step in J2EE application plateform. Student should develope a example project at the end.

MATH -2109: Complex Variable and Matrices [3.0 credits, 45 Hours Lecture]

Complex Variable: Complex number system; General functions of a complex variable; Limits and continuity of a function of complex variable and related theorems; Complex differentiation and the Cauchy Riemann Equations; Mapping by elementary functions; Line integral of

a complex function; Cauchy Integral Theorem; Cauchy Integral Formula; Liouville Theorem; Taylor Theorem and Laurent Theorem. Singular points; Residue; Cauchy Residue Theorem. Evaluation of residues; Contour integration; Conformal mapping.

Matrices: Definition of matrix; Different types of matrices; Algebra of matrices; Adjoint and inverse of a matrix; Elementary transformations of matrices; Matrix polynomials; Calay-Hamilton theory with uses of rank and nullity; Normal and canonical forms; Solution of linear equations; Eigenvalues and eigenvectors.

CSE-2110: Object Oriented Programming Language Laboratory [3.0 credits, 90 Hours Lecture]

Philosophy of Object Oriented Programming (OOP); Advantages of OOP over structured programming; Encapsulation, classes and objects, access specifiers, static and non-static members; Constructors, destructors and copy constructors; Array of objects, object pointers, and object references; Inheritance: single and multiple inheritance; Polymorphism: overloading, abstract classes, virtual functions and overriding; Exceptions; Object Oriented I/O; Template functions and classes; Multi-threaded Programming.

Reference languages: Java.