Phy 1101: Physics 1

PHY 1101: Physics 1


PHY 1102: Physics 1 Lab

PHY 1102: Physics 1 Lab. Laboratory works based on PHY 1101

Chem 1101: Chemistry

CHEM 1101: Chemistry


MAT 1102: Differential Calculus And Co-Ordinate Geometry

MAT 1102: Differential Calculus And Co-Ordinate Geometry


Eng 1101: English Reading Skill & Public Speaking

ENG 1101: English Reading Skill & Public Speaking

The course is aimed at strengthen student's reading comprehension skills and enrich their vocabulary by reading and reacting to a variety of adapted and authentic texts. Students also improve oral communication skills for professional and social interactions through extensive conversational practice. Practice includes forming and communicating opinions on contemporary issues, developing formal and informal oral presentations, giving and following directions, and narrating and giving explanations.

BAE 2101: Computer Aided Design & Drafting

BAE 2101: Computer Aided Design & Drafting

Introduction, drafting instruments and materials, lettering, alphabet of lines, dimensioning, geometric construction, conic sections, orthographic projection, isometric and oblique views, free hand sketching, construction of scale,

CSC 1102: Programming Language 1

CSC 1102: Programming Language 1 Starting Concept of Computer Programming; Introducing with the C editor's environment; Introduction to Data Types; Different Types of Operators; Different types of Expression Evaluation; Type casting; Introduction to Conditional Operators; if statement; switch statement; goto statement; Introduction to loops (while, do-while, for); Concept and use of array; Declaring one and two-dimensional arrays; Storing and accessing array elements manually and through loops; Introduction to string. Scanning and printing strings; Different types of string manipulation; Introduction to pointers; use of pointers; Calling and accessing pointer type variables; Introduction to function; Defining and calling functions; Sending and receiving parameters; Scope of variables; Introducing call by value and call by reference. Introduction to structure and union; Use of structures; Defining and accessing structures; Nested structure; File manipulation; Creating file; Opening file in different modes; Storing and retrieving information from file. Introduction to object oriented Programming. Laboratory works based on taught theory.

PHY 1203: Physics 2


PHY 1204: Physics 2 Lab

PHY 1204: Physics 2 Lab. Laboratory works based on PHY 1203

ENG 1202: Writing Skills And Communication

ENG 1202: English Writing Skills And Communication The course is designed to study various rhetorical patterns and use their writing skills to develop essays in these patterns. The rhetorical patterns studied in this course are process analysis, cause and effect, and argument/persuasion. Students will also learn the process of writing. This course will help students learn how to think more clearly, organize thoughts in logical sequence, and improve writing skills through prewriting, writing, and rewriting processes. The underlying premise of the course is that the students who take it are inexperienced writers who need practice, not that they are incapable. Like other composition courses, the course is designed to give students extensive practice in writing in order to improve their ability to invent substantial content and express it in fluent prose. It helps students learn the many functions of writing—to discover ideas, use language effectively, and communicate with and influence audiences. Along the way, students learn or review conventional practices of usage and punctuation.

MAT 1205: Integral Calculus And Ordinary Differential Equations

MAT 1205: Integral Calculus And Ordinary Differential Equations Differential Calculus: Limit, continuity and differentiability, successive differentiation of various types of functions, Leibnitz’s rule, Taylor’s theorem in finite and infinite forms. Maclaurin’s theorem in finite and infinite

**CSC 2207: Programming Language 2**

CSC 2207: Programming Language 2 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, Inheritances, Single and multiple inheritance, polymorphism, overloading, abstract classes, virtual functions and overriding, Exception: Object Oriented I/O: Template functions and classes: Multi-threaded Programming. Laboratory works based on taught theory.

**EEE 1201: Electrical Circuits 1 (DC)**

EEE 1201: Electrical Circuits 1 (DC) This is core course of Electrical and Electronic Engineering program 1) Definition of Voltage, Current, Power, Energy; Conductors, Insulators, Semiconductors and Superconductors; Resistance and Conductance, Temperature Effects on resistance of a material, Ohm’s Law, Total resistance of a series circuit; Kirchhoff’s Voltage law (KVL); Related Problems. 2) Voltage divider rule, Related Problems; Voltage sources and ground, Single subscription and double subscription notation of voltages. Internal resistance of voltage source; Total resistance and conductance of a parallel circuit, Kirchhoff’s Current Law (KCL); Current divider rule; Related Problems. 3) Voltage sources in series; Voltage sources in parallel; Open and short circuits, related problems; Series-Parallel network; Methods for solving such networks, related problems; Ladder networks, Voltage Divider (loaded and unloaded); Current sources; related problems. 4) Source conversion; Current sources in parallel, current sources in series; Related problems; Branch current analysis; Mesh Analysis; Related problems. Super-Mesh Analysis; Related problems. Nodal Analysis; Super-Node Analysis; Related problems. 5) Y-Delta and Delta-Y conversions; Related problems; Dependent Current Source, Dependent Voltage Source; Continuation of dependent sources; Related Problems. 6) Superposition Theorem; Related problems. Thevenin’s Theorem; Related problems. Norton’s Theorem; Maximum Power Transfer Theorem; Related problems. Millman’s Theorem; Reciprocity Theorem; Related problems. 7) Electric Field; Capacitance; Dielectric strength; leakage current. Various types of capacitors. Transients in Capacitive networks: Charging Phase; Related problems. Transients in Capacitive networks: Discharge phase; Related problems. Continuation of transients in Capacitive networks; Energy stored by capacitor; Stray capacitance; Capacitors in series and parallel; 8) Magnetic Field; Magnetic flux density, Permeability. Inductor; Related Problems. Faraday’s law of electromagnetic induction; Lenz’s law; Self-inductance; Related Problems. R-L transient; Storage cycle; Related Problems. R-L transient: Decay phase; Inductors in series and parallel; Related Problem. R-L and R-C circuits with DC inputs; Energy stored by an inductor; Related problem. 9) Magnetic circuits; Magnetic force, magnetizing force; Reluctance. Ohm’s law for magnetic circuits; Magnetizing Force; Hysteresis; Related Problems. Ampere’s circuital law; Series magnetic circuits; Series/Parallel magnetic circuits; Related Problems.

**EEE 1202: Electrical Circuits 1 (DC) Lab**

EEE 1202: Electrical Circuits 1 (DC) Lab Laboratory works based on EEE 1201.

**MAT 2101: Complex Variable, Laplace Transform And Z -Transform**


CSC 1203: Data Structure

CSC 2105: Internal data representation; Abstract data types, Elementary data structures: arrays, lists, Introduction to Elementary data structure (Arrays, Iteration and Recursion); Concept and details of Stacks and queues; Linked lists; Complexity Analysis (Space and time complexity); Introduction to Sorting; Searching; Tree (Basic terminology, Binary tree, Binary tree representation, Binary tree traversal), Complexity analysis, Simulations.; Binary search tree; Set and disjoint set union; Priority queues; Hashing; Graphs (Definition and terminology, Representation techniques).

MAT 3103: Statistics And Probability

MAT 3103: Statistics And Probability Probability theory, discrete and continuous probability distributions, sampling theory and estimation, test of hypothesis, regression and correlation analysis, analysis of variance, decision making using probabilities, decision trees, application of game theory.

EEE 2101: Electrical Circuits 2 (AC)


EEE 2102: Electrical Circuits 2 (AC) Lab

EEE 2102: Electrical Circuits 2 (AC) Lab Laboratory works based on EEE 2101.

EEE 2103: Electronic Devices

EEE 2103: Electronic Devices 1) Semiconductors: electron and holes in an intrinsic semiconductor, donor and acceptor impurities. 2) Introduction to solid state electronics: Energy band structure in solids, insulators, semiconductors and metals, Conductance and semiconductors, electrons and holes, 3) Diodes: open circuit $p-n$ junction, diode characteristics, small signal model of diode, and circuit applications of diode, rectifiers and zener diode. 4) Bipolar junction transistors: characteristics, different configuration of transistor amplifiers, voltage and current amplifiers small signal low frequency h parameter model analysis of transistor amplifier using $h$ parameters, high input resistance transistor circuits, transistor biasing and thermal stabilization. 5) MOSFET: Introduction- PMOS, NMOS and CMOS transistors and their switching characteristics, depletion and enhancement MOSFET.

EEE 2104: Electronic Devices Lab

EEE 2104: Electronic Devices Lab Laboratory works based on EEE 2104.
MAT 3101: Mathematical Methods Of Engineering

MAT 3101: Mathematical Methods Of Engineering

MAT 2202: Matrices, Vectors And Fourier Analysis

MAT 2202: Matrices, Vectors And Fourier Analysis

BBA 1102: Principles of Accounting

BBA 1102: Principles of Accounting
This course deals with the accumulation and use of accounting data in business, fundamental procedures and records, income measurement and preparation of financial statement. It introduces concepts, principles and system of book keeping and accounting. The whole accounting process (from transaction to financial statements preparation) is the main focus of this course.

CSC 2211: Algorithms

CSC 2211: Introduction to Algorithms; Performance Analysis; Divide and Conquer Algorithms; Dynamic Programming; Greedy Algorithms; Graph Algorithms; Shortest Path Problem; Back Tracking; Network Flows; Elementary Geometric Methods; NP - Completeness.

CSC 2107: Introduction to Database

CSC 2107: Introduction to Database Systems; Advantages of DBMS, File processing system, Data Abstraction, Schemas and instances, Data Independence, Database languages, Role of DBA, Database users, Data models, Risk of Database approach, Components of database environments, DBMS system structure; Entity Relationship Modeling; Logical Database Design and Relational Model; Normalization; Relational Algebra; Structured Query Language. Basic SQL statements, data manipulation language, data definition language, simple queries, nested queries, different types of joins, constraints, aggregate functions, views.

EEE 2205: Digital Logic Design

EEE 2205: Digital Logic Design
This is core course of Electrical and Electronic Engineering program that presents basic tools for the design of digital circuits. It serves as a building block in many disciplines that utilize data of digital nature like digital control, data communication, digital computers etc. The goal of this course is to: 1) Perform arithmetic operations in many number systems. 2) Manipulate Boolean algebraic structures. 3) Simplify the Boolean expressions using Karnaugh Map. 4) Implement the Boolean Functions using NAND and NOR gates. 5) Analyze and design various combinational logic circuits. 6) Storage Elements: Introduction to the behavior and structure of latches, flip-flops, and registers. 7) Understand the importance of state diagram representation of sequential circuits. 8) Sequential Circuits: Analyze and design clocked sequential circuits. 9) Timing Analysis: Introduction to timing analysis of combinational and sequential circuits 10) Briefly introduce the concept of Hardware Description Language (HDL) using VHDL.

EEE 2206: Digital Logic Design Lab

EEE 2206: Digital Logic Design Lab
Laboratory works based on EEE 2105.
EEE 3101: Digital Electronics

EEE 3101: Digital Electronics This is core course of Electrical and Electronic Engineering program that presents basic tools for the design of digital circuits. It serves as a building block in many disciplines that utilize data of digital nature like digital control, data communication, digital computers etc. The goal of this course is to: 1) Switching Characteristics of a semiconductor diode and transistor, Cut off, Active and saturation modes, Introduction to Integrated Circuits (ICs). 2) Special characteristics of Digital logic families and their comparative discussion. 3) Definition and Problem solving on Fan out, Noise Margin, Propagation Delay, Speed Power Product 4) Basic Diode Transistor Logic Gates: RTL, DTL and HTL, ECL & CML with operational detail. 5) TTL Logic Gates, Different outputs of TTL open collector, totem-pole, Schottky TTL, Gates with tri-state output. 6) MOS and CMOS Logic with operational detail. 7) Basic memory units and operations. 8) Memory system: RAM and ROM Family, Flash memory, Magnetic and optical storage, CCDs 9) DSP basics: Sample and Hold circuits, DAC, ADC, IC555 with applications. 10) Operating principles for Light Emitting Diode Display (LED), Liquid Crystal Display (LCD), Charge Coupled Device (CCD). 11) Introduction to Programmable Logic Devices (PLDs): Advantages & disadvantages over discrete logic gates, Implementation of digital circuits using PLDs (using PAL, PLA, CPLD and FPGA).

EEE 3102: Digital Electronics Lab

EEE 3102: Digital Electronics Lab Laboratory works based on EEE 3101

EEE 2209: Analog Electronics 1

EEE 2209: Analog Electronics 1 This is core course of Electrical and Electronic Engineering program that presents basic tools for the design of analog circuits. It promotes the knowledge about the design and implementation of analog electronics circuits for practical engineering applications and formulating their solutions. The goal of this course is to: 1) Operational Amplifiers (Op-Amp): Introduction to Op-Amps and different types of amplifier using Op-Amp. 2) AC Performance of Op-Amp: Familiarize with the frequency response of Op-Amp. 3) Active Filter: Analyze and design different types of filter. 4) Transistor at High Frequencies: Observe the performance of hybrid model and the amplifier response. 5) Feedback Amplifiers: Classify the amplifiers and analyze different methods of a feedback amplifier. Introduction to negative feedback amplifiers and their application. 6) Multistage Amplifiers: Achieve a clear idea about RC coupled amplifiers and their frequency response.

EEE 2210: Analog Electronics 1 Lab

EEE 2210: Analog Electronics 1 Lab Laboratory works based on EEE 2109

EEE 3207: Signals and Linear Systems

EEE 3207: Signals and Linear Systems This is core course of Electrical and Electronic Engineering program that prepares the student with basic skills in analyzing signals as well as systems. The goal of this course is to expose the student to: 1) Characteristics, classifications and operations of signals. 2) Characteristics of linear and time-invariant systems. 3) Methods of transient and steady state solution of Differential equations. 4) Methods of transient and steady state solution of Integro-Differential equations. 5) Convolution integral and their applications. 6) Matrix with simple applications in circuit: network function. 7) State equation and state variables for small linear systems. 8) Network theorems and Analogous systems. 9) Fourier series properties and applications. 10) Fourier Transform and its applications to signals and systems 11) Laplace transform and its application to linear circuits.

CSC 2208: Operating Systems

CSC 2208: Introduction to operating system; Computer-System Structures; Operating system structure; Processes; CPU Scheduling; Process Synchronization; Deadlocks; Memory Management; Virtual Memory; File-System Interface. Kernel and Service; Interrupt Processing; Processor Management; File Organization; File systems; Backup and Recovery; Interdependencies of the four Management; Performance Measurement; Monitoring and Evaluation; Design principles; Tools of designing; Module interface approach and evaluation of an existing operating systems; Communication and networking; Various server setup.

BAE 1201: Basic Mechanical Engineering

BAE 1201: Basic Mechanical Engineering Study of steam generation units and their accessories and mountings; Properties of Steam, internal energy, enthalpy and quality of steam, saturated and superheated steam, uses of steam tables, Mollier Charts. Steam power cycles, Rankine
cycle, Low pressure and high pressure feed heaters. Deaerators and condensers. Second law of thermodynamics; availability, irreversibility and entropy. Introduction to internal combustion engines and gas turbines. Steam turbines and their important accessories: low pressure and high pressure turbines, start, operation and shut down, lubrication, turbine glands and gland sealing. Steam extraction and regenerative feed heating. Introduction to pumps, blowers and compressors, refrigeration and air conditioning systems. Mixtures of air and vapor. Uses of Psychometric chart. Visit to power generating station in order to familiarize students with all the generating equipment and associated auxiliary plant equipment in operation. They must visit some selected power stations in the country under the supervision of faculty members as decided by the concerned department. The visit must be included as an essential part of the course and as such the same may be taken into consideration in grading of the students in this course.

CSC 2209: Object Oriented Programming 1

CSC 2209: An overview of Java, Java and Object Oriented Programming; Inheritance and Overloading; Interface and Packages, Exception handling; Threading and Mutithreading; Java I/O and New I/O; Graphical User Interface using Swing; Generics, Utilities and Collections; Graphical User Interface and Applets; Network Programming; Database Programming. Introduction and overview of XML, DTD, XSHEMA; SAX/DOM/JAXP; JAXB; Java Servlet & Servlet containers; Java Server Pages (JSP) and java Beans™; Java Server Faces/JWEBUNIT; Introduction to Apache Struts; Introduction to java.RMI; SOAP/SAAJ/UDDI/WSDL webservices; Performance issues, JDK tuning, testing, profiling, benchmarking, deploying desktop applications, JUnit.

EEE 4101: Control Systems

EEE 4101: Control Systems This is core course of Electrical and Electronic Engineering program that presents basic tools and methodologies for designing, optimizing, and understanding different control systems. It serves as a building block in many disciplines that utilizes data of analog and digital nature like digital control, data communication, digital computers etc. The goal of this course is to: 1) Introduction to feedback control and terminologies. 2) Types and parts of a control system. Examples of modern control system. 3) Mathematical modeling of physical systems. 4) Block diagram representation and simplification to canonical form by Mason’s rule, time domain specifications, and unit step response. 5) Location of poles and stability by Routh’s criterion. Linearization, controllability and observability. 6) Root locus: construction rules, dominant poles, stability, PI, PD and PID state error and static error coefficient. Frequency response: Bode, Nyquist’s Plot, Gain margin, Phase margin. 7) State space representation: formation of state equation, stability. Sampled data systems, digital control system. Introduction to fuzzy control artificial neural network.

EEE 4102: Control Systems Lab

EEE 4102: Control Systems Lab Laboratory works based on EEE 4101.

EEE 4211: Microprocessor and I/O System


MGT 3202: Engineering Management

MGT 3202: Engineering Management The purpose of this course is to acquaint engineering and science students with certain management
principles and techniques having applications in engineering and scientific fields. Topics covered are principles and functions of management, managerial work roles, functions of organizations, finance, product development, operations management, quality, project planning and management, human resources management, operations research and engineering management in practice.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 2103</td>
<td>Business Communication</td>
</tr>
<tr>
<td>EEE 4217</td>
<td>VLSI Circuit Design</td>
</tr>
<tr>
<td>CSC 4121</td>
<td>Artificial Intelligence and Expert System</td>
</tr>
<tr>
<td>COE 4000</td>
<td>Project and Thesis</td>
</tr>
<tr>
<td>EEE 3216</td>
<td>Electronics Shop (Electronic Appliances Laboratory)</td>
</tr>
<tr>
<td>CSC 3116</td>
<td>Computer Networks</td>
</tr>
<tr>
<td>CSC 3224</td>
<td>Computer Graphics</td>
</tr>
<tr>
<td>EEE 4213</td>
<td>Industrial Electronics and Drives</td>
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</tbody>
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**ENG 2103: Business Communication**

This course is designed to help the students in learning the techniques and acquiring the skills needed to communicate effectively in the business world. The course deals with the basic English in the practice to communication in different business situations. Various techniques of communication such as business letters, reports, project proposals and other media form an integral part of the course.

**EEE 4217: VLSI Circuit Design**

This is a core course of Electrical and Electronic Engineering program that presents performance parameters (delay, power, robustness etc.) of CMOS digital circuits and their geometric/physical design. The goal of this course is to teach: 1) VLSI technology: terminologies and trends 2) MOS transistor characteristics and equations 3) NMOS and CMOS inverters, DC transient characteristics 4) Pass transistors and pass gates 5) CMOS layout and design rules 6) Complex CMOS gates 7) Resistance and capacitance 8) Estimation and modeling, Signal propagation, delay, noise margin and power consumption 9) Interconnect 10) BiCMOS circuits 11) CMOS building blocks, Adders, Counters, Multipliers and barrel shifters 12) Datapaths 13) Memory Structures 14) PLAs and FPGAs 15) VLSI testing, Objectives and strategies. Laboratory works based on taught theory.

**CSC 4121: Artificial Intelligence and Expert System**

Introduction; Knowledge representation; Intelligent Agent; Rational Agent & Omniscience Agent, Structure of intelligent agent, Types of agents, Properties of Environment; Uninformed Search; Informed Search; Game Playing; Constraint Satisfaction Problem; Logic Programming; Decision Tree; Neural Networks.

**COE 4000: Project and Thesis**

Study of problems in the field of Computer Engineering.

**EEE 3216: Electronics Shop (Electronic Appliances Laboratory)**

Introduction to various home and consumer electronic appliances. Detailed working principle of a basic radio transmitter and receiver, cathode ray tube (CRT) appliances, LED TV, Household and industrial appliances like microwave oven, washing machine, refrigeration unit, power supplies like uninterruptible power supply (UPS), power banks, battery chargers etc. Identification each tool of a basic tool box for engineers and their uses. PCB design and hardware implementation of an electrical circuit for a particular project work. Practical study of electronic equipment: radio receivers, television receivers, Audio Cassette and CD player, VCR, VCP, DVD player, satellite TV receiver system.

**CSC 3116: Computer Networks**


**CSC 3224: Computer Graphics**

Introduction to Computer Graphics; Scan Conversion; Clipping; Review of Vectors & Homogeneous Co-ordinate System; Transformations; Basics of OpenGL; Projections; Animation in OpenGL; Hidden Surface Removal; Lighting basics in OpenGL.

**EEE 4213: Industrial Electronics and Drives**

Introduction to solid state devices: Thyristors, BJT, MOSFET and IGBT; Turning On and turning Off mechanisms, Introduction to triggering devices: UJT, Programmable UJT (PUT), DIAC; Power semiconductor circuits: AC to DC.
controlled converters, DC to DC converters, Single phase AC power control circuits, triggering and control circuits design. 2) DC to AC converters with frequency and voltage control, PWM and Harmonic elimination, Resonant converters, Switch mode power supplies. Introduction to SVM. Machine drives: fundamentals, quadrants of operation, torque balance, acceleration and deceleration control. DC motor drives: speed control, braking and plugging circuits for separately excited, series and shunt motors. Induction motor Drives: constant torque and constant power operation, scalar control, V/f control, slip power recovery. 3) Introduction to vector control and direct torque control. Speed control of synchronous, single phase and special machines. Applications of drives in industries. Introduction to power supplies, push-pull power supply, UPS etc. Resistance welding controls. Induction heating. Dielectric heating.

EEE 4214: Industrial Electronics Lab

EEE 4214: Industrial Electronics Lab Laboratory works based on EEE 4214.

EEE 4219: Computer System Architecture

EEE 4219: Computer System Architecture This is an advanced elective course, offered from the electrical engineering department. This course is a study of the evolution of computer architecture and the factors influencing the design of hardware and software elements of computer systems. The goal of this course is to: 1) Know the difference between computer organization and computer architecture. 2) Understand the computer as a layered system. 3) Learn the components common to every modern computer system. 4) Understand a simple architecture invented to illuminate these basic concepts, and how it relates to some real architecture. 5) Instruction set design 6) Know how the program assembly process works. 7) I/O organization, memory organization, Control unit design. Laboratory works based on taught theory.

EEE 3105: Electromagnetic Fields and Waves

EEE 3105: Electromagnetic Fields and Waves 1) Review of vector analysis, curvilinear orthogonal co-ordinates, Cartesian or rectangular, cylindrical and spherical coordinate, and solutions to static field problems. 2) Electrostatics: Coulomb's law, force, electric field intensity, electrical flux density. Gauss's theorem with application, Electrostatic potential, boundary conditions, method of images, Laplace's and Poisson's equations, energy of an electrostatic system, conductor and dielectrics. 3) Magnetostatics: Concepts of magnetic field, Ampere's law, Biot-Savart law, vector magnetic potential, energy of magnetostatic system, Mechanical forces and torques in Electric and Magnetic fields. 4) Concept of good and perfect conductors and dielectrics. Current distribution in various types of conductors, depth of penetration, internal impedance, power loss, calculation of inductance and capacitance. 5) Time Varying Fields: Maxwell's equations: Their derivatives, continuity of charges, concepts of displacement currents. Boundary conditions for time varying systems. Potentials used with varying charges and currents. Retarded potentials. Maxwell's equations in different coordinate systems. 6) Polarization: Propagation and reflection of electromagnetic waves in unbounded media: plane wave propagation, polarization, power flow and Poynting's theorem. 7) Transmission line analogy, reflection from conducting and dielectric boundary display lines ion in dielectrics, plane wave propagation through the ionosphere. Introduction to radiation.

EEE 3211: Digital Signal Processing

EEE 3211: Digital Signal Processing This course covers the techniques of modern digital signal processing that are fundamental to a wide variety of application areas. The summarized course description is as follows: 1) Discrete Fourier Transform and Fast Fourier Transform algorithms and applications, Z-transforms. 2) Frequency domain analysis of discrete-time systems. 3) Design and implementation of FIR and IIR filters with Computer-aided design projects. Laboratory works based on taught theory.

EEE 4105: Telecommunications Engineering

EEE 4105: Telecommunications Engineering This is core course of Electrical and Electronic Engineering program that presents basic understanding of Telecommunications Engineering. It serves as a foundation for the students to make them familiarized with all important aspects of Telecommunications Engineering, ranging from the old simple telephony system up to the high tech mobile communications networks while covering microwave and radar technologies, Fiber-optic communication, satellite communication systems etc. The goals of this course are: 1) Introduction to simple telephony and Telecommunication systems, signal spectra, Modulation, Analog modulation: Amplitude modulation and demodulation (DSB-SC, SSB, VSB), Frequency modulation and demodulation (NBFM, WBFM), Phase Modulation (PM), Sampling theorem, Pulse Modulation (PAM, PCM, Quantization, Binary Coding, SQNR, Companding, DPCM, Delta Modulation). 2) Introduction to digital signals and modulation techniques (ASK, PSK, FSK, CPFSK, MSK, GMSK and QAM), MODEM, DSL Technology; Overview of Multiplexing, FDM, TDM, Digital and Analog Hierarchy. 3) Introduction to Switching, different types of switching, SPC, time and space switching and digital switching systems (Circuit Switching, Packet Switching). 4) Introduction to teletraffic theory and traffic analysis. 5) Introduction
CSC 3229: Basics of Embedded programming; Introduction to Smart Card programming with java card; Introduction to J2ME, CLDC, CDC,

EEE 4106: Telecommunications Engineering Lab

EEE 4106: Telecommunications Engineering Lab Laboratory works based on EEE 4105

EEE 4221: Optoelectronic Devices

EEE 4221: Optoelectronic Devices This is core course of Electrical and Electronic Engineering program that introduces final year undergraduates to the working principles and applications of some main optoelectronic devices. The course covers the following topics:

2. Detailed study of Single/Multimode waveguides, Mode Theory, Step-index/Graded-Index Fibers, Attenuation, Dispersion, Bandwidth, Bit Rate, Absorption and Scattering.
4. Detailed study of Photodiodes and phototransistors: Quantum efficiency, Responsivity, Operation, Noise, Gain Laboratory works based on taught theory.

EEE 4205: Microwave Engineering


CSC 3229: Embedded Technologies

CSC 3229: Basics of Embedded programming; Introduction to Smart Card programming with java card; Introduction to J2ME, CLDC, CDC,
EEE 4223: Cellular Mobile Communications

The primary purpose of this course is to teach students the basic of cellular mobile communication. The fundamental concepts of handoff, frequency reuse, trunking efficiency and frequency planning for cellular mobile communications. Basics behind the large scale path loss for mobile radio propagation and different path loss models. Basics behind small scale fading, multipath and channel behaviors. Different kinds of modulation and multiple access techniques for cellular mobile communications. Differences between GSM and other types of Cellular Mobile Communication system, GSM Architecture, Functions of MSC, BSC, BTS and other functional blocks (subsystems and parts) of a GSM system. Different types of Channels and Signaling in GSM, Voice and Control channels of a GSM system, Channel Structure and traffic channels, Control Channel and Burst structure, Speech Coding, Channel coding, modulation and power coding in GSM. Situations and Techniques of Handover in GSM, Enhancement of GSM for Data transmission, (GPRS and EDGE). An introduction to CDMA in mobile communication and CDMA 2000. Brief introductions to 3G and 4G Cellular Mobile Communications Systems. Laboratory works based on taught theory.

EEE 4203: Measurement and Instrumentation

This is an Elective course of Electrical and Electronic Engineering program that presents the measurement techniques and associated instruments that are used in various applications. A short description of the course is as follows: 1) Basic requirement for meaningful measurement, significance and methods of measurement, Instruments (mechanical, electrical, electronic), classification of instruments, Null type and deflection (PMMC) type, modes (analog, digital), Functions and applications of instruments. 2) Functional block diagram and generalized measurement system, C-type Burdon type (pressure measurement system), I/O characteristics of measurement system. Desired, modified, interfering inputs. Static and dynamic characteristics, true value, static error, error calibration curve, resolution, sensitivity. 3) Resistance measurement, Wheatstone bridges, Loading effect, errors in measurement, Localization of cable fault, Murray loop test and Varley loop test (Wheatstone bridge). 4) AC bridges (Maxwell's inductance bridge, Hay Bridge, Schering Bridge). 5) High voltage measurement and test, Magnetic measurement, Illumination measurement, Analog instruments (indicating, recording and integrating), Electrodynamometer instruments, measurement of energy and industrial metering. 6) Transducers and classifications (strain gauge, pressure transducer, inductive transducer, LVDT, differential transducer, resistive transducer, piezo electric transducer, digital encoder, load cell). Measurements of liquid level (using gamma rays, ultrasonic method, electromagnetic flow meters). 7) Modem data acquisition system, operation of sample and hold circuit, Frequency measurement, Electronic instruments, digital voltmeters, resolution of digital meters. 8) RF power and voltage measurement, Cathode ray oscilloscope (CRT), components of CRT and 9) applications. Measurement frequency and phase, Instrument transformers (CT, PT). Laboratory works based on taught theory.

EEE 4233: Digital Design with System Verilog, VHDL and FPGAs

This is an elective course of Electrical and Electronic Engineering program that presents Register Transfer Level design with SystemVerilog HDL and VHDLs and targeted to FPGAs. The goal of this course is to teach: 1) Introduction to HDL-based Top-Down design methodology for ASICs and FPLDs (CPLDs/FPGAs), FPLD and ASIC architectures and Electronic Design Automation (EDA); RTL and Logic Synthesis, Mapping, Place and Route (P & R), Device Configuration, Functional and Timing Simulation. Use of an industrial EDA tool for Simulation, Synthesis, Implementation (P & R) and Hardware Realization. 2) Introduction to a standard Hardware Description Language (HDL)—Verilog HDL (IEEE Std 1364) and a standard Hardware Description and Verification Language (HDVL)—SystemVerilog (IEEE Std 1800). Basic language constructs—module, interface, ports, data types (i.e. unresolved (i.e. reg, logic) and resolved (wire) multi-valued data types, signed), design management (library and config, User-defined packages), parameterization (parameter), hierarchical structuring (component instantiation, structural replication (generate)), concurrent code (assign statements), procedural code (always), control structures (i.e. if, case, casex, while), event-control (posedge, negedge), conditional compilation. Levels of Abstraction—Behavior, Dataflow, Gate and Switch. Importance of Synthesis. 3) Advanced Digital Design with Verilog HDL and SystemVerilog—Emphasis on Behavioral Modeling and Synthesizable coding style. Design of combinational logic (adder-subtractors, multipliers, ALUs etc.) and sequential logic (registers, counters, shift registers, LFSR, Explicit and Implicit FSMs). 4) Design of FSMs and FSMDs with and without Controller-datapath partitioning. ASM and ASMD charts. Emphasis on FSM/FSMD design techniques. FSM/FSMDs for signal (pulse) generator, UART, stepper motor control and central ALU-based computation units. 5) Design of complex digital systems such as RISC processors. 6) Introduction to Pipelining. 7) Writing stimulus (Testbenches) for Verification. Introduction to Assertion-based verification—using assert and embedded PSL. Simulator control ($stop, $finish). 8) IP Encryption (‘protect). 9) Introduction to VHSCIC HDL (VHDL) standard Hardware Description Language (IEEE Std 1076). Basic language constructs. Synthesizable fixed and floating point data types (i.e. ufixed, sfixed, float). 10) A brief introduction to advanced verification features in SystemVerilog—Constrained Random Verification (CRV) and Functional Coverage. Laboratory works based on taught theory.