Course details: 3rd Year Even Semester

ECE 3205 Industrial Electronics Credits : 3.00
Power semiconductor switches and triggering devices: BJT, MOSFET, SCR, IGBT, GTO, TRIAC, UJT and DIAC. Rectifiers: Uncontrolled and controlled single phase and three phase. Regulated power supplies: Linear-series and shunt, switching buck, buckboost, boost and cuk regulators. AC voltage controllers, single and three phase. Choppers. DC motor control. Single phase cycloconverter. Inverters: single phase and three phase current and voltage source. AC motor control. Stepper motor control. Resonance inverters. Pulse width modulation control of static converters.

ECE 3206 Industrial Electronics Sessional Credits : 0.75
Sessional based on the theory of course ECE 3205.

ECE 3211 Peripherals & Interfacings Credits: 3
Microprocessor Based System Design: Hardware and software interfacing in microcomputer system design, hardware and I/O design, building, debugging, testing and linking program modules, programming EPROM.

Interfacing Components: 8284A programmable timer, bus architecture, bus timing, 8286 transceiver device, 8282 latches, 8288 bus controller, characteristics of memory and I/O interface, synchronous and asynchronous communication, serial I/O interface, 8251A communication interface, 8255A Programmable peripheral Interface.
Interrupt System: Sources of interrupt, types of interrupt, handling interrupt request, interrupt vector and table, 8259A priority interrupt controller, daisy chain.
I/O Controller and Peripheral Components: Interfacing ICs of I/O Devices, I/O ports, Programmable peripheral interface, DMA controller i.e. 8237A DMA Controller, interrupt controller, communication interface, interval timer, etc.
Memory Device: Memory Terminology, CPU-Memory Connections, ROM Architectures and Time Diagram, Different type of ROM, Flash Memory, RAM Architectures and Time Diagram, Different type o RAM and Read/Write Cycle, Programmable Logic Device Architectures.
Multi-processor configurations: co-processor configurations, Numeric data processor, I/O Processors.
Analog and Digital Interface: Sensors, Transducers, D/A interface, A/D interface, AD and DA converters related chips, High power devices.

ECE 3212 Peripherals & Interfacings Sessional Credit: 0.75
Sessional based on the theory of course ECE 3211.

ECE 3221 Operating Systems Credit: 3

Introduction to operating system: Operating system concepts, its role in computer systems, computer system structure, fundamental of different types of computer system, operating system structure and operation, protection and security.

Process management: Process concept, model and implementation, process state, process scheduling, inter-process communication (IPC), multiprocessing and timesharing, interaction between process and operating system; CPU scheduling: Scheduling concepts, scheduling criteria, scheduling algorithms (SJF, FIFO, round robin, etc.).

Memory Management: Memory portioning, with and without swapping, virtual memory – paging and segmentation, demand paging, page replacement algorithms, implementation.

File systems: FS services, disk space management, directory and data structures.

Deadlocks and Case study: Modeling, detection and recovery, prevention and avoidance; Case study of some operating systems.

Others: Introduction to the different smart device Operating system and their usage.

ECE 3222 Operating Systems Sessional Credit: 0.75

Sessional based on the theory of course ECE 3221.

ECE 3207 Communication Engineering Credits : 3.00

Overview of communication system: Basic principles, fundamental elements, system limitations, message source, bandwidth requirements, transmission media types, bandwidth and transmission capacity. Noise: Source, characteristics of various types of noise and signal to noise ratio. Communication systems: Analog and digital. Continuous wave modulation: Amplitude, Angle Modulations & Demodulations, Sampling and Pulse Modulations-PAM, PWM, PPM, PCM, DM; line coding- formats and bandwidths. Binary Modulated Bandpass Signaling: OOK, BPSK, DPSK, FSK, MSK bandwidth requirements, detection and noise performance, Multilevel Modulated Bandpass Signaling, Multiplexing: TDM- principle, receiver synchronization, frame synchronization, TDM of multiple bit rate systems; FDM- principle, de-multiplexing; wavelength-division multiplexing multiple-access network- time-division multiple-access, frequency-division multiple access, code-division multiple-access - spread spectrum multiplexing, coding techniques and constraints of CDMA. Communication system design: design parameters, channel selection criteria and performance simulation.

ECE 3208 Communication Engineering Sessional Credits : 1.50

Sessional based on the theory of course ECE 3207.

ECE 3219 Computer Aided Instrumentations Credits: 3.00

Introduction : Methods of measurement. Statistical method applied to field of measurement and error analysis and calibration.

Resistance, Inductance and Capacitance measurements: Different methods of measuring high, medium and low resistances. Methods of measuring self and mutual inductance and capacitance

measurement. A.C. and DC bridge methods, Measurement of insulation and earth resistances. Localization of cable fault.
Magnetic measurement: Flux meter, Flux and Flux density measurement. Determination of iron losses and their separation.
Measuring instruments : Classification of measuring instruments. Ammeter, Voltmeter, wattmeter, AVO meter, Energy meter, Ampere-hour meter and Maximum demand meter for measuring AC and DC quantities. Speed, frequency and phase difference measurements. Illumination measurement.
Electronic measuring instruments: Digital instruments, VTVM, Q-meter and CRO.
Instrumentation : Extension of instrument range. Use of C.T. and P.T and calculation of their burden, Instrumentation of substation.
Measurement of non-electrical quantities: Transducer. Measurement of temperature, pressure, displacement, velocity, acceleration. Strain gauge and their applications.

ECE 3220 Computer Aided Instrumentations Sessional Credits: 0.75
Sessional based on the theory of course ECE 3219.