CONTROL ENGINEERING AND AUTOMATION

MA001IU **4 credits**

Calculus 1

Functions; Limits; Continuity; Derivatives, Differentiation, Derivatives of basic elementary functions, differentiation rules; Application of Differentiation: L'Hopital's rule, Optimization, Newton's method; Anti-derivatives; Indefinite integrals, definite integrals; Fundamental theorem of calculus; Technique of integration; Improper integrals; Applications of integration.

MA003IU **4 credits**

Calculus 2

Sequence and series; Convergence tests; Power series; Taylor &Maclaurin series; Cartesian Coordinates; Lines, Planes and Surfaces; Derivatives and integrals of vector functions; Arc length and curvature; parametric surfaces; Functions of several variables; Limits, continuity, partial derivatives, tangent planes; Gradient vectors; Extrema; Lagrange multipliers; Multiple integrals: double integrals, triple integrals, techniques of integration; Vector fields, line integrals, surface integrals.

Prerequisite: MA001IU (Calculus 1)

MA027IU **2 credits**

Applied Linear Algebra

Matrices; Linear independence, Rank of a matrix, linear systems of equations, Gauss elimination, Solutions of linear systems: Existence, uniqueness, determinants, Cramer's rule, inverse of a matrix, Gauss-Jordan elimination, vector spaces, inner product spaces, linear transformations, eigenvalues, eigenvectors, applications; Symmetric, Skew-symmetric, and orthogonal matrices, Eigenbases, diagonalization; Quadratic forms, complex matrices and forms.

EEAC021IU **4 credits**

Mathematics for engineers

This course develops a synthetic view of mathematic knowledge and skills in analyzing and modeling Signals and Systems. Covers review of fundamental harmonic analysis, with applications in Electronics, Control, Communications and Signal processing.

Prerequisite: Calculus 2 (MA003IU).

MA024IU **4 credits**

Differential Equations Processes

First-order differential equations; second-order linear differential equations, undetermined coefficients, variation of parameters, applications, higher-order linear differential equations, systems of first-order linear equations, elementary partial differential equations and the method of separation of variables. This course also provides the laboratory by using Maple and Matlab to solve many different types of differential equations.

Prerequisite: MA003IU (Calculus 2)

MA026IU **3 credits**

Probability & Random Processes

Probability: sample space and events, Venn Diagram and algebra of events, probability of event, additive rules, conditional probability, Bayes rules, random variables and their distributions, mathematical expectation, some discrete probability distributions, some continuous probability distributions, functions of random variables, independence.

Mathematical Statistics: Sampling distributions and data descriptions, estimation problems, hypothesis tests, linear regressions, analysis of variance, nonparametric statistics, simulation.

Prerequisite: MA003IU (Calculus 2)

PH013IU **2 credits**

Physic 1 (Engineering Mechanics)

An introduction to mechanics including: planar forces, free body diagrams, planar equilibrium of rigid bodies, friction, distributed forces, internal forces, shear force and bending moment diagrams, simple stress and strain and associated material properties, kinematics and kinetic of particles, work and energy, motion of rigid bodies in a plane.

PH014IU **2 credits**

Physic 2 (Thermodynamics)

This course provides students basic knowledge about fluid mechanics; macroscopic description of gases; heat and the first law of thermodynamics; heat engines and the second law of thermodynamics; microscopic description of gases and the kinetic theory of gases.

PH012IU **2 credits**

Physics 4 (Waves and Optics)

Waves and optics, relativity, quantum properties of electrons and photons, wave mechanics, atomic, solid state, nuclear and elementary particle physics.

Prerequisite: PH013IU (Physic 1)

EEAC002IU **3 credits**

Materials Science and Engineering

Structure, properties, and processing of metallic, semiconductor, polymeric, ceramic, and composite materials. Perfect and imperfect solids; phase equilibria; transformation kinetics; mechanical behavior; material degradation. Approach involves both materials science and materials engineering components.

EN007IU & EN008IU **4 credits**

Academic English 1

This course concentrates on academic English listening and writing skills.

Strategies for Academic Listening, Note-taking, and Discussion will help the student face the challenges of learning English in an Academic environment. The student will learn to do all the things that successful international college students do – listen actively to lectures, take effective notes, and participate confidently in discussions

about the lecture with classmates and the lecturer. While learning these strategies, you will also learn and use common academic vocabulary as well as useful idioms.
Writing skills are developed for pre-advanced academic writers. It focuses on composition writing using Writing process, Building Framework, Description, Opinion, Process, Comparison-Contrast, Cause-Effect, Problem-Solution, and Argument. Students will have writing practice in "Real-World Writing" formats.

EN011IU & EN012IU **4 credits**
Academic English 2
This course concentrates on academic English speaking and writing skills.
Speaking subject provides students with the skills to be able prepare and deliver effective formal, structured presentations that are appropriate to the specific environment and audience.
Writing subject provides an overview of the organizational format for a research paper and assists students in completing research projects in any content area course by providing assistance in writing effective research papers using a step-by-step process approach. Course content includes the components of a research paper, and techniques of selecting and narrowing topics; writing thesis statements; outlining; locating and documenting sources; taking notes; writing introductions, body paragraphs, and conclusions; and writing rough and final drafts. Students work with projects relating to their content area courses.
Prerequisite: EN007IU & EN008IU (Academic English 1)

PE008IU **3 credits**
Critical Thinking
This course provides students the fundamental knowledge of critical thinking concept. This is a general thinking skill that is useful for all sorts of careers and professions. The course covers introduction to critical thinking; meaning analysis and argument analysis; basic logic, sentential logic (SL) and predicate logic; Venn diagrams; scientific reasoning; basic statistics; strategic thinking; values and morality; fallacies & biases; and introduction to creativity thinking.

EE049IU **3 credits**
Introduction to Electrical Engineering
This course is an introduction to engineering processes for future electrical engineering. This course provides the students with the fundamental concepts of the electrical engineering profession. In addition, the students will learn the proper usage of engineering tools, including computers and measurement equipment. Students will also perform statistical analysis of experimental data, define engineering requirements, and implement simulation.

EE050IU **3 credits**
Introduction to Computer for Engineers
This course is an introduction to solving engineering problems through the use of the computer. It introduces general problem-solving techniques including the concepts of step-wise refinement applied to the development of algorithms. This course will cover

elementary programming concepts using the programming language Matlab and apply those concepts towards the solution of engineering problems.

EE051IU **3 credits**

Principles of Electrical Engineering 1

This course is an introduction to basic circuit elements; independent sources; dependent sources; circuit analysis in DC and AC steady state; network theorems; operational amplifiers; and power computations.

Prerequisite: MA001IU (Calculus 1)
Co-requisite: EE052IU (Principles of EE 1 Laboratory)

EE052IU **1 credit**

Principles of Electrical Engineering 1 Laboratory

This course provides experimental exercises in use of laboratory instruments; voltage, current, impedance, frequency, and waveform measurements; rudiments of circuit modeling and design.

Co-requisite: EE051IU (Principles of EE 1)

EE055IU **3 credits**

Principles of Electrical Engineering 2

This course includes the following topics: transient analysis by classical methods and by Laplace transform analysis, step and impulse response, three-phase circuit and two-port networks. Passive and active filter circuit design, Butterworth filter design. Introduction to Fourier series.

Prerequisite: EE051IU (Principles of EE 1)
MA023IU (Calculus 3) for EE
EEAC002IU (Mathematics for Engineers) for AC
Co-requisite:EE056IU (Principles of EE 2 Laboratory)

EE056IU **1 credit**

Principles of Electrical Engineering 2 Laboratory

This laboratory includes topics on transient analysis; frequency response; filters design; two port network and Fourier series.

Co-requisite: EE055IU (Principles of EE 2)

EE053IU **3 credits**

Digital Logic Design

This course introduces the basic tools for design with combinational and sequential digital logic and state machines. To learn simple digital circuits in preparation for computer engineering. Main content: Binary arithmetic, Boolean algebra, K-maps, Combinational circuit synthesis, Combinational MSI circuits, Sequential logic, Synchronous state machine design, Sequential MSI circuits.

Co-requisite: EE054IU (Digital Logic Design Laboratory)

EE054IU **1 credit**

Digital Logic Design Laboratory

This laboratory includes topics on combinational SSI and MSI circuits; four-bit arithmetic circuit; sequential circuits; state machine analysis and state machine synthesis.

Co-requisite: EE053IU (Digital Logic Design)

EE057IU **3 credits**

Programming for Engineers

This course provides the basics of programming and data structures in C++ include: basic data types: loops, arrays, recursion, and pointers; object oriented design: classes, inheritance, overloading, and polymorphism; abstract data types: lists, linked lists, stacks, and queues; introduction to algorithm analysis: O notation, searching and sorting.

Prerequisite: MA001IU (Calculus 1)

Co-requisite: EE058IU (Programming for Engineers Laboratory)

EE058IU **1 credit**

Programming for Engineers Laboratory

This is a co-requisite course with EE057IU (programming for engineers).

Co-requisite: EE057IU (Programming for Engineers)

EE067IU **3 credits**

Electromagnetic Theory

Electrical conduction theories, conducting materials and insulators, magnetic and dielectric properties and materials, electrostatics and magneto-statics, steady electric currents, the magnetic field of steady electric currents, Ampere's law and its applications, electromagnetic induction, Faraday's law and its applications, electromagnetism, simple transmission lines, magnetic circuits, permanent magnets, inductors, transformers, introduction to electrical machines.

Prerequisite: Calculus 3 (MA023IU)

EE090IU **3 credits**

Electronic Devices

Fundamentals of semiconductor devices and microelectronic circuits, characteristics of p-n, Zener diodes, and analog diode circuits. Principles of MOSFET and BJT operation, biasing, transistor analysis at mid-band frequencies.

Prerequisite: EE051IU (Principles of EE 1)

Co-requisite: EE091IU (Electronic Devices Laboratory)

EE091IU **1 credit**

Electronic Devices Laboratory

Laboratory experiments in microelectronic circuits using semiconductor devices, including diodes, MOSFETs and BJTs. Employing a learn-by-doing approach, emphasizing the hands-on-experimental experiences and computer simulation.

Co-requisite: EE090IU (Electronic Devices)

EE083IU **3 credits**

Micro-processor Systems

This course provides students the fundamentals of microprocessors and microcomputers; data flow; machine programming; assembly languages, architectures and instructions sets; stacks, subroutines, I/O, and interrupts; interfacing fundamentals; designing with microprocessors, and applications of micro-processing systems to some practical problems.

Prerequisite: EE053IU (Digital Logic Design)

Co-requisite: EE084IU (Micro-processor System Laboratory)

EE084IU **1 credit**

Micro-processor Systems Lab

This is a co-requisite course of EE083IU. The laboratory includes location and description the components on the 32-Bit Microprocessor circuit board; demonstration of basic data transfer operations, memory transfers and describe memory control signals, the signals needed to transfer data between the CPU and its components, how the CPU processes hardware and software interrupts, addressing modes of the 80386 CPU; Use machine codes to write instruction for use in memory test programs and real-world applications.

Prerequisite: EE053IU (Digital Logic Design)

Co-requisite: EE083IU (Micro-processor System)

EE088IU **3 credits**

Signals & Systems

Introduction to continuous- and discrete-time systems and signals, basis function representation of signals, convolution, Fourier Series, Fourier, Laplace, Z-transform theory, state space variable analysis of linear systems, basic feedback concepts.

Prerequisite: EE055IU (Principles of EE 2)

Co-requisite: EE089IU (Signal & Systems Laboratory)

EE089IU **1 credit**

Signals & Systems Lab

Experimental exercises via simulation using MATLAB to get understanding of frequency and time domain analysis of linear dynamic systems and corresponding signals. Finding the response of continuous- and discrete-time linear systems via simulation.

Co-requisite: EE088IU (Signal & Systems)

EE092IU **3 credits**

Digital Signal Processing

Introduction to digital signal processing, sampling and quantization, A/D and D/A converters, discrete time systems, convolution, z-transforms, transfer functions, digital filter realizations, fast Fourier transforms, filter design, and digital audio applications.

Prerequisite: EE088IU (Signal & Systems)

Co-requisite: EE093IU (Digital Signal Processing Laboratory)

EE093IU **1 credit**

Digital Signal Processing Lab

To carry out software and hardware experiments illustrating the basic principles and techniques of digital signal processing and to illustrate some concrete applications, such as filtering for noise reduction and digital audio effects.

Prerequisite: EE088IU (Signal & Systems)

Co-requisite: EE092IU (Digital Signal Processing)

EEAC020IU **4 credits**

Theory of Automatic Control

This course is intended to introduce students to concepts and techniques of classical control and to briefly introduce some concepts of modern control and discrete-time. The main goal is to enable students to analyze, design, and synthesize linear control systems. Students will become familiar with analytical methods and will be exposed extensively to the use of computers for analysis and design of control systems.

*Pre-requisite***:** *Differential Equations Processes (MA024IU*)

EEAC004IU **3 credits**

PC Based Control and SCADA System

PC Based Control and SCADA system course provides students with knowledge of implementing control and measurement using PC, A/D, knowledge of DA converters, peripheral devices, the electronics that go along with sensors to refine and condition their outputs. The knowledge of Supervisory Control and Data Acquisition (SCADA) system as well as the SCADA commercial software will be included

Prerequisite: Microprocessor Systems (EE083IU)

Co-requisite: PC Based Control and SCADA System Laboratory.

EEAC005IU **1 credit**

PC Based Control and SCADA System Lab

This course is designed to provide the student with practical implementations of writing control programs using PC to supervise and acquire data though peripheral devices, exploring the sensors and various types of analog to digital converters

Prerequisite: Microprocessor Systems (EE083IU)

Co-requisite: PC Based Control and SCADA System Laboratory.

EEAC006IU **3 credits**

Programmable Logic Control (PLC)

Provide the student with fundamental concepts of PLC and PLC systems: the PLC architecture, PLC programming languages, the basic knowledge of the industrial communication network, methods of analysis, and design.

Prerequisite: Digital Logic Design (EE053IU)

Co-requisite: Programmable Logic Control Laboratory.

EEAC007IU **1 credit**

Programmable Logic Control Laboratory

This course is designed to provide the student with experimental knowledge of the S7-200 PLC from Siemens as well as S7-200 PLC systems through lab manuals: write

control programs, choose hardware for a control system such as I/O modules, communication modules, A/d, D/A modules…

Prerequisite: Programmable Logic Control.

EEAC008IU **3 credits**

Sensors and Instrumentation

This course introduces students to the state-of-the-art practice in electronic instrumentation systems, including the design of sensor/transducer elements, their respective interface electronics, and precision measurement techniques. Students will be familiarized with techniques used in acquisition, processing, and presentation of sensor signals: transducers, Fourier analysis, flow measurement, amplifiers, and bridge circuits.

Prerequisite: Principle of EE 2 (EE055IU).

EE114IU **3 credits**

Entrepreneurship

In this course the student will learn the essential skills needed to start and manage a successful new business venture. Topics will cover: the challenge of entrepreneurship, building a business plan, marketing and financial issues with a start-up company, and how to gain the competitive advantage.

EE130IU **2 credits**

Capstone Design 1

This course is an introduction to engineering design process. This course consists of two semesters of lecture and design. This course requires students to develop a project based on the knowledge and skills acquired in earlier coursework and integrate their technical knowledge through practical design effort. Students will learn to define a problem, conduct research to propose the solutions, determine the realistic constraints, prepare project scheduling, and create a planned budget for the project. The work will be performed as a team in accordance with ABET requirements. Each team is comprised of two to four students

EE132IU **2 credits**

Capstone Design 2

Students will be assigned a faculty member to oversee the progress of the project. The student will follow the design process, under the guidance of the assigned faculty member, and to develop the prototype based on the design specifications from Capstone Design Project 1. The work will be performed as a team in accordance with ABET requirements. Each team is comprised of two to four students

Prerequisite: EE131IU (Capstone Design 1)

EE107IU **2 credits**

Senior Project

In the field of Electrical Engineering, the senior focuses on design projects related to the EE field. In addition to the accumulation of theoretical knowledge, the thesis requires solving difficulties encountered in practice as well as addressing safety issues and ethics.

EE097IU **10 credits**

Thesis

These are industry type projects, designed to ensure students have master their studies in the program. All projects are based on "Real projects" provided by industry for students to work on developing skill and applying knowledge gained from all courses throughout the program. Students will work in teams to develop requirements, design, implementation, and provide a solution to the business problems. Students may follow any suitable process model, must manage the project themselves, following all appropriate project management techniques. Success of the project is determined in large part, by whether students have adequately solved their customer's problem.
Students will be expected to deliver the final products along with all artifacts appropriate to the process model they are using (i.e.: project plan, requirements specification; system and software architect documents, design documents, test plans, source code, and installable software products).

Prerequisite: EE107IU (Senior Project)

EE061IU **3 credits**

Analog Electronics

Feedback amplifier analysis, frequency response of BJT and FET amplifiers, and frequency response with feedback stability, power amplifiers, filters and tuned amplifiers, signal generator and waveform-shaping circuits.

Prerequisite: EE090IU (Electronic Devices)
Co-requisite: EE062IU (Analog Electronics Laboratory)

EE062IU **1 credit**

Analog Electronics Laboratory

This laboratory includes topics on differential transistor amplifiers; cascode amplifiers; the constant current source; current mirrors; high frequency transistor amplifiers; feedback amplifiers; stability of feedback amplifiers and feedback compensation.

Co-requisite: EE061IU (Analog Electronics)

EEAC011IU **3 credits**

Automation Manufacturing System and Technique

This course is designed to highlight the major automation-related subjects within the scope of manufacturing system. Special emphasis will be given on industrial robotics, robot programming and flexible manufacturing systems (FMS). This course also transfers to student facts in real manufacturing production lines from the experiences of lecturers and visiting speakers.

Co-requisite: Automation Manufacturing System and Technique Lab

EEAC012IU **1 credit**

Automation Manufacturing System and Technique Lab

This course is designed to allow students to practice on the major automation-related subjects within the scope of manufacturing system. Special emphasis will be given on industrial robotics, robot programming and flexible manufacturing systems (FMS). This course also transfers to student facts in real manufacturing production lines from the experiences of lecturers and visiting speakers.

Co-requisite: Automation Manufacturing System and Technique

EEAC013IU **3 credits**

Power System and Equipment

Provide the student with fundamental knowledge of electric power systems and components of power system such as: electrical generators, electric motors, relays, contactors, circuit breakers and measurement devices.

EEAC014IU **3 credits**

Neural Networks and fuzzy controls

This course exposes the student to the fundamental issues related to the neural networks and some training techniques and fuzzy logics with applications to design intelligent control systems. The course also introduces some industrial applications.

Prerequisite: Theory of Automatic Control (EE075IU)

EEAC015IU **3 credits**

Robotics

This course introduces fundamental concepts in Robotics. Basic concepts will be discussed, including coordinate transformation, kinematics, dynamics, equations of motion, feedback and feed forward control, and trajectory planning. Applying the theoretical knowledge to various motor systems, including manipulators, and mobile robotics.

Prerequisite: Theory of Automatic Control (EE075IU)

EEAC016IU **3 credits**

Industrial Electronics

Fundamentals of electronics and semiconductor devices, including basic device principles. Application of electronic devices for electric power conversion, control and operation of industrial equipment.

Prerequisite: Third year student who have completed all engineering physics, chemistry and calculus courses

EEAC017IU **3 credits**

Digital Control

This course exposes the student to the fundamental issues related to the analysis and design of digital control systems. The student will learn how to analyze, model, and design control systems that ensure desirable properties, such as stability and performance.

Prerequisite: Theory of Automatic Control (EE075IU)

EEAC009IU **3 credits**

Electrical Safety

The course is oriented to the understanding of electrical hazards to prevent it. Firstly, it introduces the student to the knowledge of how to recognize, evaluate and control electrical hazards. Some guidance regarding how to proceed in case of an emergency is also covered. Then, it provides students the safety rules and regulations for electricians, precautions for electrical and mechanical hazards on the job, tool and equipment safety, first aid, Cardio-Pulmonary Resuscitation (CPR), blood borne pathogens, Occupational Safety and Health Administration (OSHA) and National Fire Protection Association (NFPA) mandated lockout/tag-out, personal protective equipment, right to know, and confined space entry procedures.

EEAC010IU **3 credits**

Electric Machine

This course exposes the student to the fundamental of electromagnetic circuits, principle of Electro mechanical – Energy – Conversion and its applications in electric motors. This course provides also the knowledge and structure of different electric motors.

Prerequisite: Principle of Electrical Engineering 2 (EE055IU)

EE104IU **3 credits**

Embedded Real-time Systems

This course covers application and design assembly and C language programming for AVR microprocessors. Topics include system timing, bus cycles, interrupts, stacks and subroutines. Upon completion, students should be able to design, program, verify, analyze, and troubleshoot AVR assembly and C language programs

Prerequisite: EE083IU (Microprocessor Systems)

Co-requisite: EE118IU (Embedded Real-time System Laboratory)

EE118IU **1 credit**

Embedded Real-time Systems Lab

This course Integrates microprocessors into digital systems. The course Includes hardware interfacing, bus protocols and peripheral systems, embedded and real-time operating systems, real-time constraints, networking, and memory system.

Prerequisite: EE083IU (Microprocessor Systems)

Co-requisite: EE104IU (Embedded Real-time System)

EE102IU **3 credits**

Stochastic Signal Processing

Introduction to the theory and algorithms used for the analysis and processing of random signals (stochastic signals) and their applications to communications problems.

Prerequisite: EE092IU (Digital Signal Processing)

EE103IU **3 credits**

Image Processing and Computer Vision

The course begins with one-to-one operations such as image addition and subtraction and image descriptors such as the histogram. Basic filters such as the gradient and Laplacian in the spatial domain are used to enhance images. The 2-D Fourier transform is introduced and frequency domain operations such as high and low-pass filtering are developed. It is shown how filtering techniques can be used to remove noise and other image degradation. The different methods of representing color images are described and fundamental concepts of color image transformations and color image processing are developed. The concepts of image redundancy and information theory are shown to lead to image compression. Lossless and lossy image processing algorithms such as LZW will be covered and related to image compression standards such as JPEG. Programming assignments will use MATLAB and the MATLAB Image Processing Toolbox.

Prerequisite: EE088IU (Signals and Systems)
MA026IU (Probability and Random Processes)
Co-requisite: EE122IU (Image Processing Lab)

EE122IU **1 credits**
Image Processing and Computer Vision Laboratory
Experimental exercises via simulation using MATLAB to get understanding of digital image processing and basic concepts of computer vision: image enhancement in time domain and frequency domain, morphology and segmentation

Prerequisite: EE088IU (Signals and Systems)
MA026IU (Probability and Random Processes)
Co-requisite: EE103IU (Image Processing)

EEAC018IU **3 credits**
Advanced Control Engineering
The aim of this course is to introduce the student the advanced topics on control engineering. Based on state space representation in both continuous and discrete-time, the problematic of observer-based control is discussed. Then principle of optimal control is followed. The topic on non-linear control is also covered.

Prerequisite: Theory of Automatic Control (EE075IU)

EEAC019IU **3 credits**
System Diagnostic
The aim of this course is to introduce the student the initiative of fault detection, isolation and localization in physical systems. The concepts of residue and parity space in both static and dynamic case are discussed. The method for detection and isolation the abnormal sensors using state observer and state estimation is also introduced.

EE068IU **3 credits**
Principles of Communication Systems
To understand basic analog and digital communication system theory and design, with an emphasis on wireless communications methods. Main content: Analog Communication, Random processes and Noise, Quantization, Digital Communication.

Prerequisite: EE088IU (Signals and Systems)
MA026IU (Probabilities and Random Processes)

Co-requisite: EE115IU (Principles of Communication Systems Laboratory)

EE115IU **1 credit**

Principles of Communication Systems Laboratory

This course provides experiments dealing with basic fundamental concepts of communication systems. It includes the following topics: Amplitude Modulation/Demodulation; Angle Modulation/Demodulation; Sampling, Holding and Reconstruction of PAM signals; Pulse Code Modulation; Amplitude Shift Keying, Phase Shift Keying.

Co-requisite: EE068IU (Principles of Communication Systems)

EE079IU **3 credits**

Power Electronics

This course introduces the application of electronics to energy conversion and control. Topics cover modeling, analysis, and control techniques; design of power circuits including inverters, rectifiers, and DC-DC converters; analysis and design of magnetic components and filters; and characteristics of power semiconductor devices. Numerous application examples will be presented such as motion control systems, and power supplies.

Prerequisite: Electronic Devices (EE090IU)
Co-requisite: Power Electronics Laboratory

EEAC003IU **1 credit**

Power Electronics Lab

This course assists the theoretical course (Power electronics) involving the energy conversion and control. It covers the building and measuring rectifiers, inverters, and DC/DC converters; Analyzing and measuring filters; investigating into current-voltage characteristics of power semiconductor devices.

Prerequisite: Electronic Devices (EE090IU)
Co-requisite: Power Electronics

EE127IU **3 credit**

Machine Learning and Artificial Intelligence

The course is about the most effective machine learning techniques, and students gain practice implementing them and getting them to work for yourself. More importantly, you'll learn about not only the theoretical underpinnings of learning, but also gain the practical know-how needed to quickly and powerfully apply these techniques to new problems.

Prerequisite: EE090IU (Introduction to Computer for Engineers)

EE133IU **3 credit**

Emerging Engineering Technologies

This course will explore current breakthrough technologies and disruptive innovations that have recently emerged in the past few years. A close examination of the technology will be conducted to understand the application using the new technologies. The class is a series of seminars on each of the emerging technologies.