

B.S. Electrical and Computer Engineering Technology Course Descriptions

EST 3140	Engineering Management and Ethics (2 credit)
Prerequisite(s):	ENC 1101
Description:	This course explores the traditional principles of management and professional ethics related to engineering technology professions. Major emphasis will be on project planning and design alternatives to meet cost, performance, and the user along with legal issues, professional development, and technology transfer as they relate to graduating engineering technology students.

CET 3383	Software Applications in Engineering Technology (3 credit)
Prerequisite(s):	MAC 1105
Description:	Student is introduced to the latest computer software applications including virtual circuit creation and analysis (PSpice), computer aided drafting (AutoCAD), procedural programming (MATLAB), and graphical programming (LabVIEW) to solve a variety of engineering related problems.

EST 3144	Engineering Documentation and Communication (2 credit)
Prerequisite(s):	ENC 1101
Description:	This course introduces the student to the importance of writing in the professional engineering career. Topics include guidelines for professional engineering writing, eliminating intermittent noise in writing, writing letters, memoranda, online communication, common engineering documents, reports, interviews resumes, and ethics in engineering writing.

EET 3086C	Circuit analysis (3 credit)
Prerequisite(s):	EET 1025C and MAC 2311
Description:	An advanced course using differential and integral calculus and transform methods to analyze steady-state and transient responses of electrical networks in time and frequency domains. Circuit simulator and laboratory projects will provide an in-depth understanding and hands-on experience.

EET 3048	Electromagnetic Fields (3 credit)
Prerequisite(s):	PHY 2049C and EST 3360
Description:	This course introduces the concepts of steady and dynamic electromagnetic fields that are important in the design and analysis of electrical and communication systems, wireless applications, high-frequency radiation sources and microwave devices.

EET 3716	Linear Systems and Signals (3 credit)
Prerequisite(s):	EST 3360 and CET 3383
Description:	This fundamental technology course bridges the gap between analog and digital worlds. Topics include time and frequency domain analysis of continuous- and discrete-time systems, transformation techniques, and sampling theory.

EET 3732	Linear Control Systems (3 credit)
Prerequisite(s):	CET 3383 and EET 3086C
Description:	This course introduces the principles of Control Systems with an emphasis on Linear Control Systems. Topics include characterization, design, and mathematical techniques required to analyze linear control systems.

EST 3340	Statistical Theory for Engineering Technology (3 credit)
Prerequisite(s):	MAC 2312
Description:	Statistics and probability theory, sampling, correlation, regression as applied to Engineering Technology.

EST 3537	Quality Assurance with Testing Methods (3 credit)
Prerequisite(s):	EET 3086C and EST 3360
Description:	A broad understanding of the quality assurance and control of electronic products, covering all aspects of quality assurance for components used in electronic devices, improve product quality without increasing product cost. Apply Six Sigma process, methodologies, and tools to develop robust engineering products, processes, and services.
EST 3360	Engineering Mathematical Analysis (3 credit)
Prerequisite(s):	MAC 2311
Description:	Advanced mathematical concepts and methods needed to solve engineering and engineering technology problems. Topics include Complex Variables, First- and Higher-Order differential equations, Laplace transforms, Fourier series, Fourier Transforms, Z- transforms, vector calculus and analysis, Linear Algebra, and matrix analysis.
EET 4360C	Geometrical and Wave Optics (3 credit)
Prerequisite(s):	EST 1210 and EST 3360
Description:	Basic principles of geometrical and wave optics. Topics include refraction and reflection, Gaussian optics, paraxial optics, simple optical instruments, electromagnetic fields and waves; Fourier series and Fourier transforms; interference, interferometers, diffraction, image formation, and polarized light.
EET 3320C	Communication Systems (3 credit)
Prerequisite(s):	EET 3086C and EST 3360
Description:	A fundamental course in communication systems theory. Topics include relationship between time and frequency domain signals, comparison of different modulators and demodulators designs, bandwidth consideration, effect of noise and performance analysis of different communication systems.
EST4880	Photovoltaic Technologies (3 credit)
Prerequisite(s):	EET 1025C and EST 3360
Description:	Students will use PSpice and LabVIEW to analyze and simulate the performance of PV systems. Topics covered will be solar cell technological processes, PV systems engineering, characterization and testing methods, sizing procedures, economic analysis, and instrumentation.
EET4541	Power Systems and Energy Conversion (3 credit)
Prerequisite(s):	EET 3086C and PHY 2048C
Description:	A study of generation and transmission of electric energy. It introduces the student to the fundamentals of electrical machine and power electronics design, system integration, control, energy management as well as techniques used for protection and economic operation of power systems.
EET 4359C	Digital Communication (3 credit)
Prerequisite(s):	EST 3340 and EET 3086C
Description:	An advanced communication course introducing students to digital modulation and demodulation schemes, quantification of channel noise, signal coding schemes, multiple-access and spread spectrum techniques.
EET 4190C	Digital Signal Processing (3 credit)
Prerequisite(s):	CET 3383 and EET 3086C
Description:	This advanced signal processing course includes the study of signals and systems, transformation techniques, digital filter designs, and practical applications of DSP. Students will use MATLAB and a DSP microprocessor to get an in-depth understanding and hands-on experience.

EET 4548C	Power Electronics (4 credit)
Prerequisite(s):	EET 4541
Description:	An advanced level course accompanied by hands-on experiments covering the topics of control and conversion of electrical power with high efficiency. Circuits such as power converters, inverters, rectifiers, cycloconverters, and other commonly used applications will be discussed.
EET 4158C	Linear Integrated Circuits & Systems (4 credit)
Prerequisite(s):	EST 3360 or EET 3086C
Description:	An in-depth course of Operational Amplifier and its applications. Topics include study of amplifier concepts, analysis of ideal and linear operational amplifiers under DC and AC conditions, and discussion of important applications. Circuit simulator and laboratory projects will provide an in-depth understanding and hands-on experience.
EST 4360	Nanotechnology Systems and Applications (3 credit)
Prerequisite(s):	PHY 2049C and EET 3086C
Description:	Overview of the fundamentals of nanoscience and nanotechnology, a wide range of applications. The main facets of nanotechnology are covered: nanomaterials, nanomechanics, nanoelectronics, nanoscale heat transfer, nanophotonics, nanoscale fluid mechanics, and nanobiotechnology.
EET 4361C	Optical Communication Systems (3 credit)
Prerequisite(s):	EST 2220C or PHY 2049C and EST 3360
Description:	Physics of optical communication components and applications to communication systems. Topics include fiber attenuation and dispersion, laser modulation, photo detection and noise, receiver design, bit error rate calculations, and coherent communications.
EET 4362C	Optical Engineering & Lens Design (4 credit)
Prerequisite(s):	EST 2221C or PHY 2049C and EST 3360
Description:	Fundamentals of optical system layout and design; exact and paraxial ray tracing. Use of optical design software in lens design, optical materials, aberrations theory and balancing, image evaluation.
EET 4363C	Optical Detectors and Systems (3 credit)
Prerequisite(s):	EET 3086C and EET 4360C
Description:	Photodetectors; thermal detectors; photoemitters; figures of merit; responsivity; NEP; D*; BLIP conditions; MTF and thermal-imager systems; discussion of various detector types; quantitative detector comparisons.
EET 4364C	Advanced Electro-Optical Devices (4 credit)
Prerequisite(s):	EST 2221C and EET 4360C
Description:	This course aims to give a broad understanding of the physics and technology of discrete and integrated optical and optoelectronic components. The main focus is on important optoelectronic components such as waveguides, lasers, detectors and other photonic components.
EET 4365C	Laser Engineering Design (4 credit)
Prerequisite(s):	EST 2230 or PHY 2049C and EET 3086C
Description:	This course will cover the fundamental physical processes relevant to lasers and explore a variety of specific laser systems. Topics include optical resonators, laser gain and oscillation, pulsed and CW laser operation, system design considerations, and environmental effects. Focus on an examination of existing semiconductor lasers, solid-state lasers, fiber lasers, rare earth lasers, and systems that incorporate lasers as a primary component.

EET 4366	Biophotonics Technologies (3 credit)
Prerequisite(s):	EST 2221C or PHY 2049C and EST 3360
Description:	An overview of the field of biophotonics and the basic physics of light-biomatter interactions and tissue optics, light induced effects in bio-systems, diagnostic techniques and instrumentation, therapeutic instrumentation and applications, optical biosensors, imaging, and basics of optical tomography.
EET 4367	Antenna & Radar System Design (3 credit)
Prerequisite(s):	EET 3320C
Description:	This course examines concepts of radar & antenna theories and systems. Topics including radar range equation, radar cross-section calculations, random processes and noise, array antennas, beam steering, doppler and range processing, FM and CW systems, pulse compression, SAR, clutter, evaluation of various antennas and an in-depth understanding and analysis of antenna and Radar-related topics through term projects.
EET 4368	Laser Satellite & Space Communication (3 credit)
Prerequisite(s):	EET 3320C or EET 4361C
Description:	An introduction and overview of laser communication principles and technologies for unguided, free-space beam propagation. Special emphasis is placed on highlighting the differences, as well as similarities to RF communications and other laser systems, and design issues and options relevant to future laser communication terminals.
EET 4320	Wireless Communication (3 credit)
Prerequisite(s):	EST 3340 and EET 3086C
Description:	This course focuses on the analysis of wireless signals, deterioration due to diffraction and noise, ways to improve signal quality, wireless signal modulation, multiple access techniques and an overview of current wireless standards, wireless networking and cellular concepts.
EET 4939:	Senior Project Design (3 credit)
Prerequisite(s):	Departmental approval
Description:	This course is designed to test the student's ability to develop and complete a proposed project by utilizing the knowledge and experience gained from previous courses. For this final project the student is required to present a working model of the project in a professional manner. The project requirements include a comprehensive written report, research and analysis data, and oral presentations.
CET3049C	Logic Devices Programming (4 credit)
Prerequisite(s):	EET 2113C and 3086C
Description:	An in depth study of hardware and software architecture of programmable logic devices. Topics include PLDs architecture and design of Altera hardware and software description language, HDL format and syntax, and representation of data in AHDL and VHDL logic circuits.
CET4367C	Microcontrollers Devices (4 credit)
Prerequisite(s):	EET 1141C and EET 3086C
Description:	A course emphasizing the design and programming of microcontrollers. Student will be introduced to microcontroller architecture, use of programmable counter/timer arrays, analog interfaces, serial communications and other peripherals.
CET 4333	Computer Architecture (3 credit)
Prerequisite(s):	CET 2123C and CET 3049C
Description:	A study of the computer architecture. Major topics include instruction sets, modeling and analysis of computer systems, hardware and software interface, memory management, and system performance.

CET 4488	Data Communication and Networking (3 credit)
Prerequisite(s):	CET 2113C and EST 3360
Description:	An in-depth study of different layers in a computer network and processes related to each one of them. Topics includes Physical, Data link, Network, Transport and Application layers and their roles in communication of data in networking. Design and performance of a network will be analyzed through mathematical techniques.
CET 4126C	Microprocessor Programming (4 credit)
Prerequisite(s):	CET 3049C
Description:	This course is designed to introduce the student to the hardware architecture and Software architecture programming of the microprocessors. Main topics include Microcomputer Assembly Programming, operating system environment, and the hardware characteristics of the microprocessor.
CET 4663	Computer and Network Security (3 credit)
Prerequisite(s):	CET 4488
Description:	This course introduces fundamental concepts and techniques of computer security. Topics include; secure communications, secure operating systems, and network protection technologies such as firewall, intrusion detection systems, and access control policies.
COP 3275	C/C++ Programming for Engineers
Prerequisite(s):	MAC 2312
Description:	A comprehensive course in computer programming using the C and C++ programming languages. Structured programming in C, especially for solving numerical problems is covered in detail, and object-oriented programming in C++ is introduced. Computer programming is used to improve quantitative problem solving skills by developing algorithms that apply mathematical techniques.