ELECTRICAL ENGINEERING, BS

Program Description

Electrical Engineers develop electrical systems using knowledge of physics, mathematics, circuit design, electromagnetic theory, communication theory, control systems and signal processing. Electrical engineering historically involved how the generation, transmission and utilization of electrical energy. Today, electrical engineering applications also include control systems, robotics, automation, plasma, sensors, computers and imaging. The Bachelor of Science in Electrical Engineering (BSEE) program emphasizes service, systems-based knowledge, and sustainability with an eye toward the interface of traditional electrical engineering with new and emerging fields, in particular unmanned aircraft systems, maritime sciences and marine biology that directly impact the Gulf Coast.

Program Educational Objectives

The Program Educational Objectives (PEOs) describe the professional accomplishments that Electrical Engineering graduates are expected to achieve, within a few years of graduation. The PEOs are:

1. Within two years of graduation from TAMU-CC, our graduates who have chosen to pursue a career in engineering or a related field will be working in industry, government, construction, or other professional service as electrical engineers, or will be pursuing graduate degrees in electrical engineering or post-baccalaureate degrees in other fields, such as law, business, or medicine.
2. Within five years of graduation from TAMU-CC our graduates who have chosen to pursue a career in engineering or a related field will have
    - advanced in their careers as indicated by obtaining promotions and positions of leadership, awards, recognitions as subject matter experts, and/or registration as professional engineers or in other professional disciplines; or by entrepreneurial activities, products or processes developed, patents, and/or publications;
    - demonstrated the ability to increase their knowledge and expertise through continuing education or advanced degrees; and
    - contributed to the improvement of the profession and of society through research, national and/or international collaboration, and/or professional and public service including mentoring.

Student Learning Outcomes

Graduates will have:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics;
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors;
3. an ability to communicate effectively with a range of audiences;
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts;
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives;
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions; and
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Fundamentals of Engineering Exam

Students are encouraged to take the NCEES (National Council for Examiners for Engineering and Surveying) Fundamentals of Engineering (FE) exam (https://ncees.org/engineering/fe/) during their senior year. The FE exam is the first step in the process that leads to licensure as a Professional Engineer (P.E.).

Admission from pre-engineering

For all students admitted into a pre-engineering program at TAMU-CC who wish to transfer into one of the TAMU-CC engineering programs (CEEN, EEEN, IEEN, MEEN), the cumulative GPA for all MATH, CHEM, PHYS, ENGR, COSC, CEEN, EEEN, IEEN, or MEEN courses that appear in the CEEN, EEEN, IEEN, or MEEN program curricula, plus any ENTC courses, taken at TAMU-CC, or their equivalents taken at other institutions, should be 2.5 or greater to be admitted into the CEEN, EEEN, IEEN, or MEEN programs at TAMU-CC. There should be a minimum of at least 12 hours of such courses taken at TAMU-CC or elsewhere before a transfer / admission to CEEN, EEEN, IEEN, or MEEN may be considered. All such students must also meet the requirements to take MATH 2413 Calculus I (4 sch) if they have not already done so.

Master of Business Administration (MBA) Option

Electrical engineering students who have completed 96 credit hours toward the Electrical Engineering B.S. degree and earned a cumulative GPA of 3.0 or higher may elect the MBA option in senior year. Students who elect the MBA option are required to take three MBA foundation courses to satisfy the Technical Elective Block requirements:

Code	Title	Hours
ACCT 5312	Foundations of Accounting	3
ECON 5311	Foundations in Economics	3
FINA 5311	Financial Management Concepts	3

Students who plan to elect the MBA Option are encouraged to have summer internship experience before senior year, and will be able to complete an MBA degree study with 2 regular semesters and 1 summer session beyond an Electrical Engineering B.S. degree study.

General Requirements

The Electrical Engineering curriculum consists of a minimum of 128 credit hours. It can be divided into four main areas:

Requirements	Credit Hours
Core Curriculum Program (http://catalog.tamucc.edu/undergraduate/university-college/programs/core-curriculum-program/)	42
First-Year Seminars (when applicable)[1]	0-2
Common Engineering, Math and Science Courses	43
Required Electrical Engineering Courses	34
Technical Elective Block	9
Total Credit Hours	**128-130**

1

Full-time, first time in college students are required to take the first-year seminars.

- UNIV 1101 University Seminar I (1 sch)
- UNIV 1102 University Seminar II (1 sch)

Transfer students with 24 or more hours are exempt from First-Year Seminar.

Program Requirements

Code	Title	Hours
Full-time, First-year Students		
UNIV 1101	University Seminar I	1
UNIV 1102	University Seminar II	1
Core Curriculum Program		
University Core Curriculum		42
Electrical Engineering students should take: [1]		
MATH 2413	Calculus I	
PHYS 2425	University Physics I	
PHYS 2426	University Physics II	
Common Engineering, Math and Science Courses		
CHEM 1411	General Chemistry I (3 lecture hours included in University Core)	1
COSC 1320	C Programming	3
ENGR 1201	Introduction to Engineering	2
ENGR 2106	Digital Systems Laboratory	1
ENGR 2306	Digital Systems	3
ENGR 3316	Thermodynamics	3
ENGR 3322	Materials Science	3
ENGR 2325	Statics	3
ENGR 2460	Circuit Analysis	4
MATH 2305	Discrete Mathematics I	3
MATH 2413	Calculus I (included in University Core)	
MATH 2414	Calculus II	4
MATH 2415	Calculus III	4
MATH 3311	Linear Algebra	3
MATH 3315	Differential Equations	3
MATH 3345	Statistical Modeling and Data Analysis	3
PHYS 2425	University Physics I (included in University Core)	
PHYS 2426	University Physics II (included in University Core)	
Required Electrical Engineering Courses		
EEEN 3310	Electromagnetic Theory	3
EEEN 3315	Electrical Circuits II	3
EEEN 3320	Introduction to Communication Theory and Systems	3
EEEN 3330	Control Systems I	3
EEEN 3350	Electronic Systems Design	3
EEEN 3418	Microprocessors and Microcontrollers	4
EEEN 4310	Signal Processing	3
EEEN 4333	Machine Vision and Image Processing	3
ENGR 4240	Project Management	2
ENGR 4420	Engineering Lab Measurements	4
Technical Electives Block		
Students must complete 9 hours of elective courses. These may include upper-division Engineering (CEEN, EEEN, IEEN, MEEN) and 4000-level Engineering Technology (ENTC) courses outside of the required courses in their degree plans, any 4000-level MATH, COSC, BIOL, CHEM, or PHYS courses, the specified courses in the 5-year BS/MBA program, and other courses approved by the Department of Engineering.		9
Capstone Project		
ENGR 4370	Capstone Projects	3
Total Hours		**130**

1

Electrical Engineering students must take two courses in physics even if the natural science portion of the core curriculum is satisfied by other means. Students transferring to Texas A&M University - Corpus Christi from other institutions may have various means for fulfilling the core curriculum. Please refer to the "General Education Requirement" in the catalog section entitled "Undergraduate Programs (http://catalog.tamucc.edu/undergraduate/undergraduate-programs/)."

Capstone Project

All electrical engineering students must complete a senior-level capstone project in ENGR 4370 Capstone Projects (3 sch). Students will work with practicing engineers and mechanical engineering faculty. The Capstone Project will give engineering students practical, professional experience to prepare them for careers in electrical engineering.

Course Sequencing

First Year

Fall		Hours
UNIV 1101	University Seminar I	1
ENGL 1301	Writing and Rhetoric I	3
ENGR 1201	Introduction to Engineering	2
CHEM 1411	General Chemistry I	4
MATH 2413	Calculus I	4
HIST 1301	U.S. History to 1865	3
	Hours	**17**
Spring		
UNIV 1102	University Seminar II	1
ENGL 1302 or COMM 1311	Writing and Rhetoric II or Foundation of Communication	3
HIST 1302	U.S. History Since 1865	3
MATH 2414	Calculus II	4

MATH 2305	Discrete Mathematics I	3
PHYS 2425	University Physics I	4
	Hours	**18**
Second Year		
Fall		
ENGR 2306	Digital Systems	3
ENGR 2106	Digital Systems Laboratory	1
COSC 1320	C Programming	3
MATH 2415	Calculus III	4
PHYS 2426	University Physics II	4
Creative Arts Core Requirement		3
	Hours	**18**
Spring		
ENGR 2325	Statics	3
ENGR 3316	Thermodynamics	3
ENGR 3322	Materials Science	3
ENGR 2460	Circuit Analysis	4
MATH 3315	Differential Equations	3
	Hours	**16**
Third Year		
Fall		
EEEN 3315	Electrical Circuits II	3
EEEN 3418	Microprocessors and Microcontrollers	4
MATH 3311	Linear Algebra	3
MATH 3345	Statistical Modeling and Data Analysis	3
POLS 2305	U.S. Government and Politics	3
	Hours	**16**
Spring		
EEEN 3310	Electromagnetic Theory	3
EEEN 3320	Introduction to Communication Theory and Systems	3
EEEN 3330	Control Systems I	3
EEEN 3350	Electronic Systems Design	3
Technical elective		3
Social and Behavioral Sciences Core Requirement		3
	Hours	**18**
Fourth Year		
Fall		
ENGR 4420	Engineering Lab Measurements	4
ENGR 4240	Project Management	2
EEEN 4310	Signal Processing	3
Technical elective		3
Language, Philosophy & Culture Core Requirement		3
	Hours	**15**
Spring		
ENGR 4370	Capstone Projects	3
EEEN 4333	Machine Vision and Image Processing	3
Technical elective		3
POLS 2306	State and Local Government	3
	Hours	**12**
	Total Hours	**130**

Courses

Electrical Engineering Courses

EEEN 3310 Electromagnetic Theory
3 Semester Credit Hours (3 Lecture Hours)
An introduction to the theory of static and dynamic electromagnetic fields with a focus on engineering applications. Principles will be illustrated with applications in various areas. Topics include computational electromagnetics, transmission lines, antennas, electromagnetic interference, and signal propagation in high speed circuits.
Prerequisite: PHYS 2426, MATH 2415, 3315 and EEEN 3315.

EEEN 3315 Electrical Circuits II
3 Semester Credit Hours (3 Lecture Hours)
AC circuit analysis principles: AC generation, periodic functions, complex numbers, phasors, impedance and admittance, network theorems, power, frequency response, filters, transformers, and balanced three-phase systems; and use of analysis software.
Prerequisite: (ENGR 2305) or (ENGR 2460).

EEEN 3320 Introduction to Communication Theory and Systems
3 Semester Credit Hours (3 Lecture Hours)
Frequency domain and time domain response of linear systems; analog modulation methods including amplitude modulation, frequency modulation and phase modulation; signal and noise modeling using probabilistic descriptions; narrowband random processes and the performance of analog modulation techniques in the presence of noise; design of communication links.
Prerequisite: (ENGR 2305 and 2105 or ENGR 2460) and MATH 3345.

EEEN 3330 Control Systems I
3 Semester Credit Hours (3 Lecture Hours)
Introduction to control systems; open and feedback; Laplace transform and frequency response; control valves; electric motors; P, PI, and PID modes of control; analog and digital controllers Process characteristics; analysis of control systems; gain and phase margin; stability.
Prerequisite: (ENGR 2305 or 2460) and MATH 3311.

EEEN 3345 Electronic Devices and Circuits
3 Semester Credit Hours (3 Lecture Hours)
The applications of electronic devices, including linear and non-linear Op-Amp circuits, oscillators, wave-shaping circuits, active filters, rectifiers, voltage regulators, and power supplies; industrial electronics. Offered Fall and Spring.
Prerequisite: EEEN 3315.

EEEN 3350 Electronic Systems Design
3 Semester Credit Hours (3 Lecture Hours)
Principles of engineering design of electronic circuits and systems; time and frequency responses; network analysis; systems specifications; evaluation, testing, and verification; use of electronic design automation tools. Offered Fall and Spring.
Prerequisite: (ENGR 2305 or 2460) and (ENGR 2306 and EEEN 3315).

EEEN 3418 Microprocessors and Microcontrollers
4 Semester Credit Hours (3 Lecture Hours, 3 Lab Hours)
Introduction to microprocessor/microcontroller architecture, assembly language programming, and interfacing. Topics include computer organization, addressing modes, instruction set, interrupts, timing, memory, and interfacing.
Prerequisite: COSC 1320 and (ENGR 2306 and 2106).
Co-requisite: SMTE 0099.

EEEN 4310 Signal Processing
3 Semester Credit Hours (3 Lecture Hours)
Discrete time signals & systems, z-transform, discrete Fourier transform, flow graph and matrix representation of digital filters, digital filter design techniques and computation of the fast Fourier transform (FFT). MATLAB software package is heavily utilized in this course.
Prerequisite: (EEEN 3320) and (EEEN 3330).

EEEN 4330 Introduction to Plasma Engineering and Applications
3 Semester Credit Hours (3 Lecture Hours)
Physical, electrical, chemical properties of plasmas; differences in properties of thermal and non-thermal plasmas, direct and alternating current plasma sources, inductive and capacitive coupled plasma sources, diagnostics and applications of plasmas.
Prerequisite: (ENGR 3322 and 2460 or ENGR 2305 or PHYS 2426).

EEEN 4331 Power Transmission and Distribution
3 Semester Credit Hours (3 Lecture Hours)
This course covers principles of power transmission and distribution. Topics include unbalanced distribution; point to point measurements, operation control of systems; power systems; transmission lines; fault analysis; line modeling and unit analysis. Offered Fall or Spring.
Prerequisite: EEEN 3315.

EEEN 4332 Power Protection Systems
3 Semester Credit Hours (3 Lecture Hours)
Course topics include safety, reliability and availability in power systems; breaker operation; relay operation and relay circuit design; fault tolerance; cost analysis; control systems and system surveillance. Offered in Fall.
Prerequisite: EEEN 3315.

EEEN 4333 Machine Vision and Image Processing
3 Semester Credit Hours (3 Lecture Hours)
Introduces students to automated vision systems and components, camera models, testing and measurement, and fundamentals of image processing. Topics include image analysis and processing in binary, gray scale and color images in spatial- and frequency-domain. Texture and shape analysis, hyperspectral imaging, other transforms, and filters are discussed and applied.
Prerequisite: (COSC 1320 or 1435) and (ENGR 2460 or 2305) and MATH 2414 and EEEN 4310.

EEEN 4334 Control Systems II
3 Semester Credit Hours (3 Lecture Hours, 1 Lab Hour)
Model identification and parameter estimation (least-square identification of an auto-regressive model; nonparametric identification in the time domain; and nonparametric identification in the frequency domain); Robust Control (Nyquist-plots, small-gain, and passivity); Optimal control (LQR/LQG for state-space systems and time-optimal controller for the positioning of a mass using force actuation); Nonlinear control (Lyapunov's stability method; feedback linearization controller for a fully actuated 2nd order mechanical system; backstepping for triangular nonlinear systems; actuator limitations); writing and presenting reports and analysis.
Prerequisite: (EEEN 3330 or ENTC 4446).

EEEN 4345 Sensors and Systems
3 Semester Credit Hours (3 Lecture Hours)
(3:0) This course introduces sensors and sensing systems, and the acquisition, processing, and interpretation of signals obtained with selected sensors and systems. The course will also cover sensing modalities, signal transmission and reception. Measurement and uncertainty in sensors and systems will be discussed as applied to signal noise and interference. Filtering and estimation will be introduced. Sensing systems for vision, monitoring, and control applications will be surveyed. Sensor interfacing, signal conditioning and transforms will be applied. Other topics include multidimensional signal and image processing, object tracking, multisensor data fusion, applications in environmental monitoring, remote sensing and surveillance. Offered in alternating Fall semesters.
Prerequisite: (MATH 2414 and ENGR 2460).

EEEN 4396 Directed Independent Study
1-3 Semester Credit Hours
(1-3) Requires a formal proposal of study to be completed in advance of registration, approval of supervising faculty and department chairperson.

EEEN 4453 Mechatronics
4 Semester Credit Hours (3 Lecture Hours, 2 Lab Hours)
This course introduces a multidisciplinary field that combines electrical engineering, mechanical engineering, control systems and computer science. It presents key aspects in the design of systems, devices and products and it aims at the analysis of the behavior and control of the systems. Topics covered in this course bring together different areas of technology involving actuation systems, computer-aided design, sensors, signal conditioning, data acquisition, and programming. Course includes lab sessions related to acquiring experience with electronics, computer-aided design, programming, and control systems.

Engineering Courses

ENGR 1201 Introduction to Engineering
2 Semester Credit Hours (1 Lecture Hour, 2 Lab Hours)
Introduction to the engineering profession, ethics, and disciplines; development of skills in teamwork, problem solving and design; other topics include computer applications and programming; Newton's laws, unit conversions, statistics. Offering: Fall and Spring.
Prerequisite: MATH 1314.

ENGR 1312 Engineering Graphics I
3 Semester Credit Hours (2 Lecture Hours, 2 Lab Hours)
Topics include, depending on the major: emphasis on computer applications and programming and solids modeling using CAD tools or other software; fundamentals of engineering science; advanced graphic skills. Pre-req: MATH 1314 - College Algebra or equivalent academic preparation. Offered Fall and Spring.
Prerequisite: MATH 1314.
TCCNS: ENGR 1304

ENGR 2105 Electrical Circuits Laboratory
1 Semester Credit Hour (3 Lab Hours)
Laboratory experiments supporting theoretical principles presented in ENGR 2305 involving DC and AC circuit theory, network theorems, time, and frequency domain circuit analysis. Introduction to principles and operation of basic laboratory equipment; laboratory report preparation.
Prerequisite: ENGR 2305*.
* May be taken concurrently.
Co-requisite: ENGR 2305, SMTE 0099.

ENGR 2106 Digital Systems Laboratory
1 Semester Credit Hour (3 Lab Hours)
Basic laboratory experiments supporting theoretical principles presented in ENGR 2306 involving design, construction, and analysis of combinational and sequential digital circuits and systems, including logic gates, adders, multiplexers, encoders, decoders, arithmetic logic units, latches, flip-flops, registers, and counters; preparation of laboratory reports.
Co-requisite: ENGR 2306, SMTE 0099.

ENGR 2305 Electrical Circuits
3 Semester Credit Hours (3 Lecture Hours)
Principles of electrical circuits and systems. Basic circuit elements (resistance, inductance, mutual inductance, capacitance, independent and dependent controlled voltage, and current sources). Topology of electrical networks; Kirchhoff 's laws; node and mesh analysis; DC circuit analysis; operational amplifiers; transient and sinusoidal steady-state analysis; AC circuit analysis; first- and second-order circuits; Bode plots; and use of computer simulation software to solve circuit problems.
Prerequisite: PHYS 2426 and MATH 2414.
Co-requisite: ENGR 2105.

ENGR 2306 Digital Systems
3 Semester Credit Hours (3 Lecture Hours)
Introduction to theory and design of digital logic, circuits, and systems. Number systems, operations and codes; logic gates; Boolean Algebra and logic simplification; Karnaugh maps; combinational logic; functions of combinational Logic; flip-flops and related devices; counters; shift registers; sequential logic; memory and storage.
Prerequisite: MATH 2305*.
* May be taken concurrently.
Co-requisite: ENGR 2106.

ENGR 2325 Statics
3 Semester Credit Hours (3 Lecture Hours)
Theory of engineering mechanics involving forces, moments, and couples on stationary structures; equilibrium in two and three dimensions; free body diagrams; truss analysis; friction; centroids; centers of gravity and moments of inertia.
Prerequisite: PHYS 2425 and MATH 2414*.
* May be taken concurrently.
TCCNS: ENGR 2301

ENGR 2326 Dynamics
3 Semester Credit Hours (3 Lecture Hours)
Theory of engineering mechanics involving the motion of particles, rigid bodies and systems of particles; Newton's Laws; work and energy relationships; principles of impulse and momentum; application of kinetics and kinematics to the solution of engineering problems.
Prerequisite: ENGR 2325.
TCCNS: ENGR 2302

ENGR 2460 Circuit Analysis
4 Semester Credit Hours (3 Lecture Hours, 3 Lab Hours)
This course covers principles of electronics: charge, voltage, resistance, current, and power; Ohm's Law; Kirchhoff's voltage and current laws; RC and LC circuits; periodic functions, average and RMS measurements; transformers, electrical measurement instruments. The laboratory provides hands-on experience with devices and circuits discussed in the classroom.
Prerequisite: (PHYS 2426, MATH 2414 and 3315*).
* May be taken concurrently.
Co-requisite: SMTE 0099.
TCCNS: ENGR 2305

ENGR 3315 Fluid Mechanics
3 Semester Credit Hours (3 Lecture Hours)
Fluid properties, fluid statics, dynamics, and kinematics, conservation of energy and momentum incompressible, laminar and turbulent flow. Similitude and dimensional analysis, and viscous flow. Offered: Fall Spring.
Prerequisite: MATH 3315*, ENGR 2326 and MATH 2415.
* May be taken concurrently.

ENGR 3316 Thermodynamics
3 Semester Credit Hours (3 Lecture Hours)
Theory and application of energy methods in engineering; conservation of mass and energy; energy transfer by heat, work and mass; thermodynamic properties; analysis of open and closed systems; the second law of thermodynamics and entropy; gas, vapor and refrigeration cycles.
Prerequisite: (PHYS 2425 and MATH 2414).

ENGR 3320 Strength of Materials
3 Semester Credit Hours (3 Lecture Hours)
Concepts in strength of materials, stress, strain; deformation under load, direct, shear, and combined stresses; stress concentrations, bending stresses and torsional shear stresses, deflection in beams and shafts; columns, and pressure vessels.
Prerequisite: ENGR 2325 and 3322 or ENGR 2322.

ENGR 3322 Materials Science
3 Semester Credit Hours (3 Lecture Hours)
Structure and properties of metallic and nonmetallic materials; microstructure, mechanical testing, phase diagrams, heat treatment, testing, ceramics, polymers, composites, construction materials, failure analysis, nondestructive evaluation, corrosion and thermal properties of materials.
Prerequisite: (CHEM 1411 and PHYS 2425).

ENGR 3350 Manufacturing Processes
3 Semester Credit Hours (2 Lecture Hours, 3 Lab Hours)
Introduction to metal and non-metallic manufacturing processes; casting, forging, rolling, extrusion, sheet metal forming, cutting tools turning and milling operations, abrasive machining, welding and joining, powder compaction, molding, forming of plastics, surface treatment, human factors and safety.
Prerequisite: ENGR 1312 and 3322.
Co-requisite: SMTE 0099.

ENGR 4240 Project Management
2 Semester Credit Hours (2 Lecture Hours, 2 Lab Hours)
Foundations of engineering economy, cash flow and equivalence, and project justification. Introduction to project management, planning, scheduling, and control, use of project management software, GANTT charts, PERT charts, and critical path. Students prepare proposals, including specifications, timelines, schedule, and budget, for projects to be implemented in ENGR 4370 - Capstone Projects. This course should be taken the semester preceding ENGR 4370 - Capstone Projects.
Prerequisite: (MEEN 3330 and 3345) or (EEEN 3330, 3310 and 3350) or (IEEN 3302 and 3320) or (CEEN 3320 and 4304).
Co-requisite: SMTE 0099.

ENGR 4350 Machine Vision and Image Processing Applications
3 Semester Credit Hours (3 Lecture Hours)
Introduces students to automated vision systems and components, camera models, testing and measurement, and fundamentals of image processing. Topics include image analysis and processing in binary, gray scale and color images in spatial- and frequency-domain. Texture and shape analysis, hyperspectral imaging, other transforms, and filters are discussed and applied.
Prerequisite: (COSC 1330 or 1435) and ENGR 2460 and MATH 2414.

ENGR 4370 Capstone Projects
3 Semester Credit Hours (1 Lecture Hour, 5 Lab Hours)
This course allows students to employ the knowledge attained in other courses to implement (including building, testing, and documenting) an approved project, within budget and on schedule. Course requirements include a written report and oral presentations.
Prerequisite: ENGR 4240.
Co-requisite: SMTE 0099.

ENGR 4390 Special Topics in Engineering
1-3 Semester Credit Hours (1 Lecture Hour)
Subject material variable. May be repeated for credit when topics are different.

ENGR 4420 Engineering Lab Measurements
4 Semester Credit Hours (2 Lecture Hours, 4 Lab Hours)
Principles of physical measurements; standards, calibration, error estimation; static and dynamic performance of measuring systems; laboratory experience, experiment planning, report writing. The purpose of this course is for students to gain proficiency in designing, assembling, and operating an experiment; and analyzing and presenting experimental results. This encompasses skills such as an understanding control and data acquisition electronics, operation and limitation of modern sensors, calibration and error analysis, assessing applicability of theory and the impact of secondary experimental variables, and writing and presenting reports and analysis.
Prerequisite: PHYS 2426 and (MATH 3342 or 3345).
Co-requisite: SMTE 0099.