

Electrical and Computer Engineering Courses

Courses

EE 1105. Lab for EE 1305.

Laboratory for Electrical Engineering 1305 (0-3) Introduction to Electrical Engineering laboratory procedures, causes, and correction of errors in measurements theory of operation and usage of basic Electrical Engineering test instruments, and report writing. Corequisite: EE 1305. Major restriction: EE

Department: Electrical & Computer Eng.

1 Credit Hour

3 Total Contact Hour

3 Lab Hour

0 Lecture Hour

0 Other Hour

Major Restrictions:

Restricted to majors of LDEE

Corequisite(s): EE1305

EE 1305. Intro to Electrical Engineer.

Introduction to Electrical Engineering (3-0) An introduction to mathematical and systems concepts that form the basis for electrical engineering. Includes an introduction to circuit components, voltage and current concepts. Also included are sinusoidal signal characteristics, basic filter responses and bandwidth concepts. Corequisite: EE 1105. Prerequisite: MATH 1411 with a grade of "C" or better, may be taken concurrently with EE 1305.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (MATH 1411 w/C or better) OR (MATH 1312 w/C or better) OR (MATH 2313 w/C or better) OR (MATH 2326 w/C or better) OR (MATH 1411A w/C or better AND MATH 1411B w/C or better AND MATH 1411C w/C or better)

EE 2151. Lab for EE 2351.

Laboratory for Electrical Engineering 2351 (0-3) Use of oscilloscopes, function generators, and power supplies to test and study electrical networks and their behavior. Technical writing and computer aided design. Major Restriction: EE. Corequisite: EE 2351. Prerequisite: EE 1105 or EE 1110 with a grade of "C" or better. Laboratory fees required. . . .

Department: Electrical & Computer Eng.

1 Credit Hour

3 Total Contact Hour

3 Lab Hour

0 Lecture Hour

0 Other Hour

Prerequisite(s): (EE 1105 w/C or better)

EE 2169. Laboratory for EE 2369.

Laboratory for EE 2369 (0-3) Implementation and testing of basic combinational and sequential digital systems. Corequisite: EE 2369. Restricted to major: EE and CS.

Department: Electrical & Computer Eng.

1 Credit Hour

3 Total Contact Hour

3 Lab Hour

0 Lecture Hour

0 Other Hour

Prerequisite(s): (EE 1105 w/C or better AND EE 1305 w/C or better) OR (CS 1101 w/C or better AND CS 1301 w/C or better) OR (CS 1401 w/C or better)

EE 2350. Electric Circuits I.

Introduction to systematic methodologies for the analysis of electric circuits in DC and AC steady state. Use of simulation tools for steady state circuit analysis. Can be taken concurrently with PHYS 2421 and MATH 2326.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 1305 w/C or better) AND (PHYS 2421 w/C or better) AND (MATH 1312 w/C or better AND MATH 2326 w/C or better)

EE 2351. Electric Circuits II.

Electric Circuits II Analysis of transient behavior in first-order and second order circuits. Circuit analysis using the Laplace transforms. Network functions and frequency response representation of circuits. Frequency selective circuits. Resonance in electric circuits. Steady-state analysis of circuits fed by non-sinusoidal periodic signals using Fourier series. Two-port networks. Computer-aided analysis of circuits.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Major Restrictions:

Restricted to majors of EE, LDEE

Prerequisite(s): (EE 2350 w/C or better) AND (PHYS 2421 w/C or better) AND (MATH 2326 w/C or better)

Corequisite(s): EE2151

EE 2353. Cont. Time Signals & Systems.

Representation and analysis of continuous time signals; time and frequency analysis of linear time-invariant systems; convolution, differential equations, Laplace transform, Fourier series and transform, filters.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 2351 w/C or better) AND (MATH 1312 w/C or better AND MATH 2326 w/C or better)

EE 2369. Digital Systems Design I.

Digital Systems Design I (3-0) (Common course number COSC 1309) Design and synthesis of digital systems using both combinational and sequential circuits. Includes laboratory projects implemented with standard ICs. Restricted to major: CS, LDCS, LDEE/GEN, and LDEE/COMP. Corequisite: EE 2169.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Major Restrictions:

Restricted to majors of CS, EE, LDCS, LDEE

Prerequisite(s): (EE 1105 w/C or better AND EE 1305 w/C or better) OR (CS 1101 w/C or better AND CS 1301 w/C or better) OR (CS 1401 w/C or better)

Corequisite(s): EE2169

EE 2372. Software Design I.

Software Design I: An introduction to software design with a structured computer language that focuses on the construction of programs consisting of multiple functions residing in multiple files. Covers program creation and top-down-design, basic elements and operations, modular program construction, and the use of programming tools such as makefiles. Introduces object oriented programming techniques. [Common Course Number ENGR 2304]

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (CS 1320 w/C or better)

EE 3138. Lab for Electrical Engr 3338.

Laboratory for Electrical Engineering (0-3) Introduction to experimental analysis of junction diodes, bipolar junction transistors, and junction field effect transistors. Frequency response measurements of operational amplifier circuits. Fourier analysis. PSpice simulations. Corequisite: EE 3338. Restricted to major: EE. Prerequisite: EE 2351 and EE 2151, each with a grade of "C" or better.

Department: Electrical & Computer Eng.

1 Credit Hour

3 Total Contact Hour

3 Lab Hour

0 Lecture Hour

0 Other Hour

Prerequisite(s): (EE 2151 w/C or better AND EE 2351 w/C or better)

Corequisite(s): EE3338

EE 3154. Laboratory for EE 3354.

Laboratory for EE3354 The EE3154 laboratory complements the lecture EE 3354 Introduction to communication networks. The objective is to apply the theory covered in the lecture to analyze and simulate the behavior of communication technologies.

Department: Electrical & Computer Eng.

1 Credit Hour

3 Total Contact Hour

3 Lab Hour

0 Lecture Hour

0 Other Hour

Major Restrictions:

Restricted to majors of EE, LDEE

Corequisite(s): EE3354

EE 3176. Laboratory For EE 3376.

Laboratory for Electrical Engineering 3376 (0-3) Assembly language programming of microcomputer systems. Major Restrictions: EE, CS, EECE Corequisite: EE 3376 Junior standing required. Prerequisites: EE 2369, EE 2169, and EE 2372, each with a grade of "C" or better.

Department: Electrical & Computer Eng.

1 Credit Hour

3 Total Contact Hour

3 Lab Hour

0 Lecture Hour

0 Other Hour

Prerequisite(s): (EE 2169 w/C or better AND EE 2369 w/C or better AND EE 2372 w/C or better)

EE 3193. Undergraduate Service Learning.

Undergraduate Service Learning Undergraduate students will engage in projects with a community partner to apply their engineering skills in service-learning activities under the mentorship of a faculty member from the ECE Department. Students are expected to devote the equivalent of at least 3 hours of work per week of actual work per credit hour. A report covering the service experience will be submitted by the student to the faculty mentor at the end of each semester. Faculty approval required prior to enrollment.

Department: Electrical & Computer Eng.

1 Credit Hour

3 Total Contact Hour

0 Lab Hour

0 Lecture Hour

3 Other Hour

Major Restrictions:

Restricted to majors of EE

Classification Restrictions:

Restricted to class of JR,SR

EE 3194. Undergraduate Research.

Undergraduate Research Undergraduate students conduct research work under the mentorship of a faculty member from the ECE Department. Students are expected to devote at minimum 3 hours of work per week of effective research. Faculty approval required prior to enrollment.

Department: Electrical & Computer Eng.

1 Credit Hour

3 Total Contact Hour

0 Lab Hour

0 Lecture Hour

3 Other Hour

Major Restrictions:

Restricted to majors of EE, LDEE

Classification Restrictions:

Restricted to class of JR,SO

EE 3195. Junior Professional Orientat.

Junior Professional Orientation (1-0) Professional Orientation for Junior Electrical Engineering Students. Introduction to the engineering profession with emphasis on systems engineering, job placement, and professional and ethical conduct in the engineering workplace. Required of all students prior to graduation. Prerequisite: Department approval.

Department: Electrical & Computer Eng.

1 Credit Hour

1 Total Contact Hour

0 Lab Hour

1 Lecture Hour

0 Other Hour

Major Restrictions:

Restricted to majors of EE

EE 3321. Electromagnetic Field Theory.

Electromagnetic Field Theory (3-0) Fundamental laws and concepts of static and time-varying electromagnetics, wave propagation in free space and lossy media, wave reflections, transmission lines, basic radiation sources and arrays. Restricted to majors: EE and EECE.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Major Restrictions:

Restricted to majors of EE, EECE

Prerequisite(s): (EE 2350 w/C or better) AND (PHYS 2421 w/C or better) AND (MATH 2313 w/C or better AND MATH 2326 w/C or better) AND (MATH 2313 w/C or better) OR (MATH 2326 w/C or better)

EE 3325. Applied Quantum Mech for EE.

An introductory course designed to provide students with a fundamental understanding of electron energy, electron/ photon interaction, and electron energy transitions; electromagnetic wave theory and quantization of photon energy; laser theory and operation; and advanced applications such as quantum dots, zener diodes and resonant tunneling diodes. This includes applying boundary conditions to solve the time independent Schrodinger's equation, normalization of the wave function, and applying fundamental solutions such as the infinite potential well (particle-in-a-box) and finite potential well to laser, quantum dot and tunneling applications. Recommended concurrent course EE 3125. Prerequisites: (PHYS 2421 w/C or better) and (EE 2350 w/C or better) and (MATH 1312 w/C or better) and (MATH 2326 w/C or better). Restricted to EE majors, and to Class of JR

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 2350 w/C or better) AND (PHYS 2421 w/C or better) AND (MATH 1312 w/C or better AND MATH 2326 w/C or better)

EE 3329. Fund. of Semiconductor Dev.

Fundamentals of Semiconductor Devices (3-0) Energy band models, electron and hole concentrations and transport, P-N junction, bipolar junction transistors, and field effect devices. Restricted to majors: EE and EECE. Prerequisite: EE 3325 and EE 3321 each with grade of "C" or better.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 3338 w/C or better AND PHYS 2421 w/C or better)

EE 3338. Electronics I.

Electronics I is an introduction to electronic devices and circuits: Amplifier concepts, diodes, field effect transistor amplifiers, bipolar junction transistor amplifiers. Corequisite: EE 3138. Prerequisite: EE 2351 with a grade of C or better and department approval.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 2351 w/C or better)

EE 3340. Electronics II.

Electronics II (3-0) Analysis and design of linear integrated circuits stressing impedance levels, gains and frequency responses. Complex plane concepts. Active filter and oscillator design. Pulse response and stability analysis. Restricted to majors: EE and EECE.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 3338 w/C or better)

EE 3353. Discrete Time Signals & System.

Discrete Time Signals & Systems (3-0) Representation and analysis of discrete time signals and systems, Z-transform, DT Fourier transform, DFT, FFT, and difference equations. Emphasizes applications to communications, control and signal processing. Restricted to major: EE.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 2353 w/C or better) AND (MATH 2326 w/C or better) AND (MATH 2326 w/C or better)

EE 3354. Intro to Communication Netwks.

EE 3354: Intro to Communication Networks Familiarization with communication networks through simulation experiments done with computer software. Topics include Protocol Layers, Link Analysis, Circuit and Packet switches, LANs, and Internet Protocols. Prerequisites: EE 2351 and EE 2372, both with grades of "C" or better.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Major Restrictions:

Restricted to majors of EE

Classification Restrictions:

Restricted to class of JR,SR

Prerequisite(s): (EE 2353 w/C or better AND EE 2372 w/C or better)

Corequisite(s): EE3154

EE 3372. Software Design II.

Software Design II (3-0) An introduction to object-oriented software design. Covers basic language elements, operations, and design concepts; emphasizes program design and construction using extensible, reusable modules.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 2372 w/C or better)

EE 3376. Microprocessor Systems I.

Microprocessor Systems I (3-0) Study of microprocessor programming models, assembly language, macro assembles, and an introduction to system integration and interfacing.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Major Restrictions:

Restricted to majors of CS, EE, LDEE

Prerequisite(s): (EE 2372 w/C or better) AND (EE 2369 w/C or better) AND (EE 2350 w/C or better)

EE 3384. Intro to Prob. w/ App. in ECE.

Introduction to Probability with Applications in Electrical and Computer Engineering: Introduction to probability, sets, combinatorics, random variables, distribution functions, conditional probability, statistical independence, moments, functions of random variables, and Central limit theorem. Computer simulations illustrate various concepts. Provides applications in Electrical and Computer Engineering.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (MATH 2313 w/C or better) OR (MATH 2326 w/C or better) AND (EE 2353 w/C or better)

EE 3385. Energy Conversion.

Energy Conversion (3-0) Theory and performance characteristics of electro-mechanical energy conversion equipment to include transformers and both d-c and a-c generators and motors and the control devices employed therewith. Restricted to majors: EE, EECE. Prerequisite: EE 3321 w/C or better and PHYS 2420 w/C or better.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 3321 w/C or better) AND (PHYS 2420 w/C or better)

EE 4142. Laboratory For EE 4342.

Laboratory for EE 4342 (Digital Systems Design II) (0-3) Design and verification of digital systems using simulation. Laboratory implementation using standard, integrated circuits and programmable logic devices. Corequisite: EE4342. Restricted to majors: EE, COMP, ENGR, UDG. Prerequisites: EE 3376 w/C or better and EE 3176 w/C or better.

Department: Electrical & Computer Eng.

1 Credit Hour

3 Total Contact Hour

3 Lab Hour

0 Lecture Hour

0 Other Hour

Prerequisite(s): (EE 3176 w/C or better AND EE 3376 w/C or better)

EE 4153. Lab for EE 4353.

EE 4153: Laboratory for EE 4353 (0-1) Simulation, fabrication, and testing of MOS technology. Includes silicon oxidation, lithography, etching, thin film deposition, and diffusion. Corequisite: EE 4353 Prerequisite: EE 3329 with a grade of "C" or better.

Department: Electrical & Computer Eng.

1 Credit Hour

1 Total Contact Hour

1 Lab Hour

0 Lecture Hour

0 Other Hour

Prerequisite(s): (EE 3329 w/C or better)

EE 4171. Engineering Problems.

Engineering Problems (0-0-1) Original investigation of special problems in the student's field, the problem to be selected by the student with the approval of the head of the department. A maximum of three credit hours of Engineering Problems may be applied toward the BS Degree. Restricted to majors: EE, COMP ENGR. Prerequisites: Senior standing and department approval.

Department: Electrical & Computer Eng.

1 Credit Hour

1 Total Contact Hour

0 Lab Hour

0 Lecture Hour

1 Other Hour

Major Restrictions:

Restricted to majors of EE, EECE

Classification Restrictions:

Restricted to class of SR

EE 4178. Laboratory For EE 4378.

Laboratory For Electrical Engineering 4378 (0-3) Use of development tools in the design and implementation of microprocessor-based systems.

Restricted to majors: COMP SCI, EE, COMP ENGR UDG. Co-requisite: EE 4378. Prerequisites: EE 3376 w/C or better and EE 3176 w/C or better.

Department: Electrical & Computer Eng.

1 Credit Hour

3 Total Contact Hour

3 Lab Hour

0 Lecture Hour

0 Other Hour

Prerequisite(s): (EE 3176 w/C or better AND EE 3376 w/C or better)

EE 4181. Co-op Work Experiences.

Co-op Work Experiences (0-0-1) Work experience in business, industrial, governmental, professional, service, or other organizations to provide on-the-job training and professional preparation in the student's area of interest. A report covering the work experience must be submitted by the student to the departmental Co-op Coordinator at the end of each work period. Upon completion of his or her third work period and submission of a report summarizing the total work experience, a student can use three hours of Co-op Work Experience in his or her degree plan in place of a technical elective or elective in the major. Restricted to major: EE, COMP ENGR UDG. Prerequisites: Selection by the Co-op Coordinator, department approval, and employer.

Department: Electrical & Computer Eng.

1 Credit Hour

1 Total Contact Hour

0 Lab Hour

0 Lecture Hour

1 Other Hour

Major Restrictions:

Restricted to majors of EE, EECE

Classification Restrictions:

Restricted to class of JR,SR

EE 4182. Co-op Work Experiences.

Co-op Work Experiences (0-0-1) Work experience in business, industrial, governmental, professional, service, or other organizations to provide on-the-job training and professional preparation in the student's area of interest. A report covering the work experience must be submitted by the student to the departmental co-op coordinator at the end of each work period. Upon completion of his or her third work period and submission of a report summarizing the total work experience, a student can use three hours of Co-op Work Experience in his or her degree plan in place of a technical elective or elective in the major. Restricted to majors: EE, COMP ENGR UDG. Prerequisite: Selection by th Co-op coordinator, department approval, and employer.

Department: Electrical & Computer Eng.

1 Credit Hour

1 Total Contact Hour

0 Lab Hour

0 Lecture Hour

1 Other Hour

Major Restrictions:

Restricted to majors of EE, EECE

Classification Restrictions:

Restricted to class of JR,SR

EE 4183. Co-op Work Experiences.

Co-op Work Experiences (0-0-1) Work experiences in business, industrial, governmental, professional, service, or other organizations to provide on-the-job training and professional preparation in the student's area of interest. A report covering the work experience must be submitted by the student to the departmental Co-op Coordinator at the end of each work period. Upon completion of his or her third work period and submission of a report summarizing the total work experience, a student can use three hours of Co-op Work Experience in his or her degree plan in place of a technical elective or elective in the major. Restricted to majors: EE & COMP ENGR. Prerequisites: Selection by the Co-op Coordinator, department approval, and employer.

Department: Electrical & Computer Eng.

1 Credit Hour

1 Total Contact Hour

0 Lab Hour

0 Lecture Hour

1 Other Hour

Major Restrictions:

Restricted to majors of EE, EECE

Classification Restrictions:

Restricted to class of JR,SR

EE 4185. Biomedical Instrumentation Lab.

Biomedical Instrumentation Laboratory Research into development, implementation, testing, and validation of wired or wireless biomedical instruments using state-of-the-art mobile technologies.

Department: Electrical & Computer Eng.

1 Credit Hour

3 Total Contact Hour

3 Lab Hour

0 Lecture Hour

0 Other Hour

Classification Restrictions:

Restricted to class of JR,SR

Prerequisite(s): (EE 3340 w/C or better)

Corequisite(s): EE4385

EE 4193. Undergrad Services Learning.

Undergraduate Services Learning Undergraduate students will engage in projects with a community partner to apply their engineering skills in service-learning activities under the mentorship of a faculty member from the ECE Department. Students are expected to devote the equivalent of at least 3 hours of work per week of actual work per credit hour. A report covering the service experience will be submitted by the student to the faculty mentor at the end of each semester. Faculty approval required prior to enrollment.

Department: Electrical & Computer Eng.

1 Credit Hour

3 Total Contact Hour

0 Lab Hour

0 Lecture Hour

3 Other Hour

Major Restrictions:

Restricted to majors of EE

Classification Restrictions:

Restricted to class of JR,SR

EE 4194. Undergraduate Research.

Undergraduate Research Undergraduate students conduct research work under the mentorship of a faculty member from the ECE Department.

Students are expected to devote at minimum 3 hours of work per week of effective research. Faculty approval required prior to enrollment.

Department: Electrical & Computer Eng.

1 Credit Hour

3 Total Contact Hour

0 Lab Hour

0 Lecture Hour

3 Other Hour

Major Restrictions:

Restricted to majors of EE

Classification Restrictions:

Restricted to class of JR,SR

EE 4196. Special Topics Lab in ECE.

Special Topics Lab in ECE Laboratory study of a selected topic in Electrical and Computer Engineering.

Department: Electrical & Computer Eng.

1 Credit Hour

3 Total Contact Hour

3 Lab Hour

0 Lecture Hour

0 Other Hour

Major Restrictions:

Restricted to majors of EE

Classification Restrictions:

Restricted to class of JR,SR

Prerequisite(s): (EE 3138 w/C or better AND EE 3176 w/C or better)

EE 4220. Senior Project Lab I.

Senior Project Lab I (2-4) Research & Analysis leading to a preliminary design for an approved engineering project. Includes formal project proposal and work plan; specification of functional, performance and cost goals; generation of computer-aided design documents and simulation or modeling results. Design process is concluded in EE 4230 through prototyping, testing and revisions.

Department: Electrical & Computer Eng.

2 Credit Hours

6 Total Contact Hours

4 Lab Hours

2 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 3195 w/C or better) AND (EE 3176 w/C or better) AND (EE 3321 w/C or better) AND (EE 3325 w/C or better) AND (EE 3340 w/C or better) AND (EE 3353 w/C or better) AND (EE 3376 w/C or better) AND (EE 3138 w/C or better) AND (CE 2326 w/C or better)

EE 4230. Senior Project Lab II.

Senior Project Laboratory II (1-2) Laboratory development of special projects concerned with various electrical systems. Small group or individual semester projects are stressed. Restricted to major: EE and EECE. Prerequisite: EE 4220 and EE 3329, each with a grade of "C" or better.

Department: Electrical & Computer Eng.

2 Credit Hours

3 Total Contact Hours

2 Lab Hours

1 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 4220 w/C or better)

EE 4342. Digital Systems Design II.

Digital Systems Design II (3-0) Design techniques for complex digital systems, with emphasis on computer hardware design and computer-aided techniques, including hardware description languages and hardware simulation packages. Algorithmic State Machine design is stressed for small systems. Emphasis on problem definition, design, and verification. Prerequisite: EE 3376 with a grade of "C" or better. EE 4142 must be taken concurrently with EE 4342. Restricted to major: EE, EECE.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Major Restrictions:

Restricted to majors of EE, EECE

Prerequisite(s): (EE 3376 w/C or better)

Corequisite(s): EE4142

EE 4347. Applied Electromagnetics.

Applied Electromagnetics (3-0) The study of static and time-varying electromagnetic principles and laws in their application to modern technology, natural phenomena, as well as to scientific and industrial devices and systems from dc to microwave frequencies. Prerequisite: EE 3321 with a "C" or better.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 3321 w/C or better)

EE 4350. Theory & Appl Contemp Devices.

Theory and Application of Contemporary Devices: Theory and application of contemporary devices based on electronic, optoelectronic, electromechanical, and other operating principles for analog, digital and quantum applications. May be repeated once for credit with departmental approval.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 3325 w/C or better AND EE 3329 w/C or better)

EE 4353. VLSI Nanotechnology.

EE 4353: VLSI Nanotechnology (3-0) Introduction to the science and technology of integrated device/circuit fabrication. Includes silicon oxidation, lithography, etching, thin film deposition, diffusion and ion implantation. Prerequisite: EE 3329 with a grade of "C" or better. Corequisite: EE 4153

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 3329 w/C or better)

EE 4356. Real-Time Digital Signal Proc.

Real-Time Digital Signal Processing: Programming-intensive project-based course emphasizing practical application of Digital Signal Processing (DSP) algorithms implemented on a DSP development system. Topics covered include sampling and reconstruction, digital filtering, fast Fourier transform, spectrum analysis, and modulation.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 3353 w/C or better AND EE 3376 w/C or better) OR (CS 3432 w/C or better)

EE 4357. Biomechatronics.

Biomechatronics is an interdisciplinary study of biology, neurosciences, mechanics, electronics and robotics. The study focuses on the interactivity of biological organs (including the brain) with electromechanical devices and systems. The course will cover topics including, but not limited to the human muscle, skeleton, and nervous system, with the goals of assisting or enhancing human motor control that can be lost or impaired by disease, trauma, or other defects. The course is designed for BS students.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

EE 4358. Med Diag & Therap Instrum.

Principles, applications and design of medical, diagnostic, therapeutic, clinical laboratory instrumentation used in modern hospitals and clinics. Integration of concepts and techniques from human physiology, electronics, digital signal processing, and systems engineering to analyze and design biomedical instruments. Electrical safety aspects in medical instrumentation and medical environment. Prerequisites: EE 4385 with a C or better and departmental approval. The course is intended for BS Students.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 4385 w/C or better)

EE 4359. Biomedical Signal & Image Proc.

Principles, methods, and algorithms for processing biomedical signals. Application of advanced DSP techniques to a number of problems in biomedical research and clinical medicine. Topics include biomedical data acquisition, filtering, feature extraction, modeling and imaging, with examples from cardiology, neurophysiology, muscular physiology, and medical imaging. Prerequisites: EE 4383 with a C or better and departmental approval. Intended for BS students.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 3353 w/C or better)

EE 4360. Telemedicine & Imaging Inform.

Telemedicine is a rapidly developing application of clinical medicine where medical information is transferred through interactive audiovisual media for the purpose of consulting, and sometimes remote medical procedures or examinations. It will cover topics such as clinical, technical and administrative issues in telemedicine. Will also cover healthcare delivery in low-resource settings, by using advanced technologies. The course is intended for BS students. Prerequisites: Departmental approval required.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

EE 4361. Fiber Optic Communication.

Fiber Optic Communication (3-0) Light propagation using ray and electromagnetic mode theories, dielectric slab waveguides, optical fibers attenuation and dispersion in optical fibers, optical fiber transmitters and receivers, electro-optical devices, and optical fiber measurement techniques. Restricted to majors: EE, EECE. Prerequisite: EE 3438 and EE 3321, each with a grade of "C" or better.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Major Restrictions:

Restricted to majors of EE, EECE

Prerequisite(s): (EE 3438 w/C or better) OR (EE 3338 w/C or better) AND (EE 3321 w/C or better)

EE 4364. Systems and Controls.

Systems and Controls (3-0) Analysis and design of discrete and continuous time linear systems. Relationships between frequency and time domain design. Analysis of system stability and performance using root locus, lead lag compensation, and other techniques. Applications to practical systems.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 2351 w/C or better AND EE 2353 w/C or better)

EE 4365. Foundations of Deep Learning.

Foundations of Deep Learning: Concepts and techniques in deep learning in AI. Historical and current paradigms for implementation, and their applications.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 2372 w/C or better AND EE 3353 w/C or better)

EE 4366. Fuzzy Logic and Engineering.

EE 4366: Fuzzy Logic and Engineering (3-0) Underlying philosophy of the theory of fuzzy sets and its applications in engineering. Fuzzy logic, fuzzy reasoning and rules, and fuzzy systems. Decision- making in the realm of vague, qualitative and imprecise data. Current models, simulation tools, hardware implementations and their applications will also be covered. Prerequisites: EE 3353 and EE 3384, both with a minimum grade of "C."

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Major Restrictions:

Restricted to majors of EE

Classification Restrictions:

Restricted to class of SR

Prerequisite(s): (EE 3353 w/C or better) AND (EE 3384 w/C or better)

EE 4371. Engineering Problems Seminar.

Engineering Problems (0-0-3) Original investigation of special problems in the student's field, the problem to be selected by the student with the approval of the head of the department. A maximum of three credit hours of engineering problems may be applied toward the BS degree. Major Restrictions: EE, EECE Prerequisite: Senior standing and department approval

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

0 Lecture Hours

3 Other Hours

Major Restrictions:

Restricted to majors of EE, EECE

Classification Restrictions:

Restricted to class of SR

EE 4374. Operating System Design.

Operating Systems Design (3-0) Design and implementation of single and multiuser operating systems. Topics include OS structure, process management, interprocess communication within and between CPUs, memory managements, file systems and I/O. Contemporary operating systems provide design examples. Major Restrictions: EE, EECE, CS Prerequisites: EE 3372 with a grade of "C" or better; junior standing

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Major Restrictions:

Restricted to majors of CS, EE, EECE

Classification Restrictions:

Restricted to class of JR,SR

Prerequisite(s): (EE 3372 w/C or better)

EE 4375. VLSI Design.

VLSI Design (3-0) Introduction to CMOS VLSI design and computer-aided VLSI design tools. A term project is required that involves high-level design approaches, layout editing, simulation, logic verification, timing analysis, and testing. Major Restrictions: EE, EECE.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 3338 w/C or better)

EE 4376. CMOS Digital Circuit Design.

EE 4376: CMOS Digital Circuit Design (3-0) Analysis and design of digital integrated circuits in CMOS technology. Discussion of different models for MOS transistors and how to use them to analyze circuit performance. Analysis of logic families and styles including complementary static logic, dynamic, and pass-transistor. Topics include sizing for minimum delay, noise and noise margin, power dissipation and cost. A significant circuit design is assigned as a final project such as an SRAM memory or Content Addressable Memory. Prerequisite: EE 3329 with a grade of "C" or better.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Major Restrictions:

Restricted to majors of EE

Classification Restrictions:

Restricted to class of SR

Prerequisite(s): (EE 3329 w/C or better)

EE 4377. Applied Photovoltaics.

Applied Photovoltaics Semiconductors have emerged as the most promising material class of materials that can convert sunlight directly into electrical energy. This course presents the fundamental principles of the solar energy conversion process and the most common cell technologies are discussed. This course will also cover a range of fundamental problems and the relationship between the physics, material science, and technology aspects of solar cell development.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Major Restrictions:

Restricted to majors of EE

Classification Restrictions:

Restricted to class of JR,SR

Prerequisite(s): (EE 3329 w/C or better) OR (MME 3309 w/C or better)

EE 4378. Microprocessor Systems II.

Microprocessor Systems II (3-0) A study of a 16/32 bit microprocessor family and companion devices and various design aspects of microprocessor systems. Restricted to majors: EE, COMP ENGR, CS. Co-requisite: EE 4178. Prerequisite: EE 3376 with grade of "C" or better.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 3376 w/C or better)

EE 4379. Computer Architecture.

Computer Architecture (3-0) Organization of CPUs; memory hierarchies, including cache and virtual memories; parallel processing, including pipelining and multiprocessing. Restricted to majors: EE, COMP ENGR, CS. Prerequisite: EE 3376 with a grade of "C" or better.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 3376 w/C or better)

EE 4380. Microwave Engineering.

Microwave Engineering (3-0) Primarily a senior level undergraduate course concerning distributed-elements analysis and design of electric circuits at microwave frequencies. Topics include transmission lines, waveguides, two-port microwave circuits, matching, tuning, resonators, dividers, and directional couplers. Restricted to majors: EE and EECE. Prerequisite: EE 3321 with a grade of "C" or better.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 3321 w/C or better)

EE 4382. Antenna Engineering.

Antenna Engineering (3-0) Introductory antenna theory and design. Fundamentals and definitions, simple radiating systems, arrays, line sources, wire antennas, broadband antennas, and antenna measurements. Prerequisite: EE 3321 with a grade of "C" or better.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Classification Restrictions:

Restricted to class of JR,SR

Prerequisite(s): (EE 3321 w/C or better)

EE 4383. Digital Signal Processing.

Digital Signal Processing (3-0) An introduction to basic one-dimensional processing methods including: sampling and quantization; discrete-time Fourier and z-domain LTI systems analysis, theory of operation and computational aspects of FIR and IIR digital filters; the discrete Fourier transform and its application to spectral analysis. Restricted to majors: EE, UNDG COMP ENGR, CS. Prerequisite: EE 3353 with a grade of "C" or better.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Classification Restrictions:

Restricted to class of JR,SR

Prerequisite(s): (EE 3353 w/C or better)

EE 4384. Control of Electric Power.

Introduction to Flexible AC Transmission Systems (FACTS), High Voltage Direct Current (HVDC) power transmission systems, and electric drives and applications. Prerequisites: EE 4387 with a grade of "C" or better.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 4387 w/C or better)

EE 4385. Biomedical Instrumentation.

Biomedical Instrumentation (3-0) An introduction to basic concepts in biomedical instrumentation, blood flow measurement, biopotential amplifiers and electrodes as well as electrical safety of medical equipment. Prerequisite: EE 3340 with a grade of "C" or better.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Classification Restrictions:

Restricted to class of JR,SR

Prerequisite(s): (EE 3340 w/C or better)

Corequisite(s): EE4185

EE 4386. Computational Methods In EE.

Computational Methods in Electrical Engineering (3-0) A presentation of the fundamental numerical techniques used in engineering, including solution of systems of linear and nonlinear equations, interpolation and curve-fitting, solution of ordinary and partial differential equations. Prerequisites: EE 3321 with a grade of "C" or better and familiarity with MATLAB. . . .

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Major Restrictions:

Restricted to majors of EE, EECE

Classification Restrictions:

Restricted to class of JR,SR

Prerequisite(s): (EE 3321 w/C or better)

EE 4387. Intro to Power Electronics.

Introduction to the architecture and operating principles of electronic power converters. Modeling, simulation, and design of electronic power converters. Applications in areas such as power supplies, aerospace and vehicular power systems, and renewable energy will be discussed. Prerequisites: EE 3338 and EE 3385 w/grade of "C" or better.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 3338 w/C or better AND EE 3385 w/C or better)

EE 4388. Digital Communications.

Digital Communications (3-0) Techniques of sampling; digital basedband transmission; digital modulation schemes; introduction to coding and fundamental limits on system performance. Restricted to majors: EE, COMP ENGR. Prerequisite: EE 3384 and EE 3353, each with a grade of "C" or better.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Prerequisite(s): (EE 3353 w/C or better AND EE 3384 w/C or better)

EE 4389. High Resolution Radar.

High Resolution Radar (3-0) Basic theory for design and analysis of radar systems that perform target and surface imaging. Concepts and definitions, the radar range equation, modern radar design, wideband waveforms and signal processing, synthetic high resolution radar, synthetic aperture concepts. Restricted to majors: EE, COMP ENGR. Prerequisite: EE 3321 and EE 3353, each with a grade of "C" or better.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

Major Restrictions:

Restricted to majors of EE, EECE

Classification Restrictions:

Restricted to class of JR,SR

Prerequisite(s): (EE 3321 w/C or better AND EE 3353 w/C or better)

EE 4394. Undergraduate Research.

Undergraduate Research Undergraduate students conduct research work under the mentorship of a faculty member from the ECE Department.

Students are expected to devote at minimum 9 hours of work per week of effective research. Faculty approval required prior enrollment.

Department: Electrical & Computer Eng.

3 Credit Hours

9 Total Contact Hours

0 Lab Hours

0 Lecture Hours

9 Other Hours

Major Restrictions:

Restricted to majors of EE

Classification Restrictions:

Restricted to class of JR,SR

EE 4395. Special Topics-Electrical Engr.

Special Topics in Electrical Engineering (3-0) Selected topics of current interest in Electrical Engineering. May be repeated once for credit when topic varies. Restricted to majors: EE, COMP EMGR. Prerequisites: Senior standing in engineering and department approval.

Department: Electrical & Computer Eng.

3 Credit Hours

3 Total Contact Hours

0 Lab Hours

3 Lecture Hours

0 Other Hours

EE 4396. Practicum in Elect & Comp Eng.

Practicum in Electrical and Computer Engineering Internship experience in electrical or computer engineering under the supervision of a ECE faculty member and an external technical supervisor. The practicum is designed to provide ECE students with the opportunity to integrate the knowledge and skills developed during their academic program in a structured, supervised, real-world professional setting under the direction of a site supervisor.

Requires a project proposal approved by the faculty member and a final report.

Department: Electrical & Computer Eng.

3 Credit Hours

9 Total Contact Hours

0 Lab Hours

0 Lecture Hours

9 Other Hours

Major Restrictions:

Restricted to majors of EE

Classification Restrictions:

Restricted to class of JR