

Education: Teaching English to Speakers of Other Languages (EDTE)

EDTE 540 THEORIES AND RESEARCH IN SECOND LANGUAGE ACQUISITION (3)

This course provides an overview and critical examination of the theories and research in second language acquisition (SLA) and explores relationships between this work and second language teaching and learning. Major theories examined will include those from cognitive, psycholinguistic, sociolinguistic, and sociocultural perspectives. Prerequisite: admission to the SOE M.A. Program.

EDTE 541 ADVANCED PEDAGOGICAL GRAMMAR (3)

In this course you will gain an understanding of the grammar of English and how to use this understanding in teaching English as a second or foreign language. We will explore a variety of current perspectives and approaches to describing and teaching grammar. Prerequisites: admission to SOE M.A. Program, EDTE 544.

EDTE 542 TEACHING MULTILINGUAL WRITERS (3)

This course investigates the theory and practice of learning to write in a second language from an applied linguistics perspective. Topics will include the theoretical developments in L1 and L2 composition, current research issues, and pedagogical concerns, among others. Prerequisite: Admission to the SOE M.A. Program, EDTE 544.

EDTE 543 PRACTICUM IN TEACHING ESL (3)

The practicum is designed to provide students with an opportunity to observe an ESL teacher(s) and to have a supervised experience in teaching English learners. A seminar accompanies the field experience. Prerequisites: admission to the SOE M.A. Program, EDTE 544.

EDTE 544 ADVANCED METHODS OF TEACHING ENGLISH AS A SECOND/FOREIGN LANGUAGE (3)

This course is designed to provide an in-depth study of methods for teaching English to non-native speakers at various levels. Students will link theory to practice through the study of current methods for teaching and developing speaking, listening, reading, and writing processes in English. Prerequisite: admission to the SOE M.A. Program.

EDTE 545 SPECIAL TOPICS IN TEACHING ESL/EFL (3)

Special Topics in the fields of applied and sociolinguistics related to teaching English as a second or foreign language will be offered on a rotating basis. Prerequisite: admission to the SOE M.A. Program.

Electrical Engineering (EE)

EE 110 INTRODUCTION TO ENGINEERING AND LABORATORY EXPERIENCE (1)

Laboratory, 3 hours. This course is designed to introduce principles of engineering to the students and expose them to the electronics and computer lab environment. The students are given opportunity to design and build some simple analog and digital circuits and make measurements using various types of lab equipment. Prerequisite: Must be eligible to enroll in MATH 45 or MATH 161. Instructor's consent required for co-enrollment with EE 112.

EE 112 FUNDAMENTALS OF DIGITAL LOGIC DESIGN (1)

Laboratory, 3 hours. Review of set theory and binary system, digital logic, Venn diagram, logic gates, minimization techniques, combinatorial logic and design of simple combinatorial logic circuits such as 1-bit adder; concept of coders, decoders, and integrated circuits. Prerequisites: EE 110 and Must be eligible to enroll in MATH 45 or MATH 161. Instructor's consent is required for co-enrollment in EE 110.

EE 220 ELECTRIC CIRCUITS (3)

Lecture, 3 hours. Review of Kirchhoff's laws, circuit design, node and mesh analysis, etc.; Thevenin's theorem, Norton's theorem, steady state and transient analysis, transfer function. AC power and three-phase circuits, Y-Delta equivalents. Multi-port networks, two-port networks with energy storage, ideal transformers. Amplifiers and frequency response, filters. Prerequisites: EE 110, and CS 115, and MATH 211; Co-requisite: EE 221 and PHYS 214; or consent of instructor.

EE 221 ELECTRIC CIRCUITS LABORATORY (1)

Laboratory, 3 hours. Laboratory work on material treated in EE 220 emphasizing elementary design principles. Prerequisites: EE 110, and CS 115, and MATH 211; Co-requisite: EE 220 and PHYS 214; or consent of instructor.

EE 230 ELECTRONICS I (3)

Lecture, 3 hours. Theory, characteristics, and operation of diodes, bipolar junction transistors, and MOSFET transistors; analog and digital electronic circuits; design and analysis of analog electronic circuits such as filters, operational amplifiers, and single and multistage amplifiers; modeling and simulation using spice/multisim software. Prerequisites: Prerequisites: EE 220 and EE 221, MATH 211, and CS 115.

EE 231 ELECTRONICS I LABORATORY (1)

Laboratory, 3 hours. Laboratory work to accompany EE 230. Computer-assisted design of electronic circuits involving devices such as diodes and transistors. Design, building, and testing of electronic circuits such as filters, oscillator, amplifiers, etc. Prerequisites: EE 220 and EE 221, MATH 211, and CS 115.

EE 310 MICROPROCESSORS AND SYSTEM DESIGN (3)

Hardware architecture of a general-purpose microprocessor and a micro-controller, memory hierarchy and supporting peripherals in micro controllers, comparison of various micro-controller architectures and capabilities, embedded system design using a micro-controller, data transfer protocols supported by a micro-controller, process of code writing, compiling, and executing programs using an IDE and a simulator. Prerequisites: EE 210 and EE 230, co-requisite EE 310L, or consent of instructor

EE 310L MICROPROCESSORS & SYSTEM DESIGN LAB (1)

Laboratory work includes building and programming a microcontroller-based system and interfacing it to various external peripherals. Prerequisites: EE 210 and EE 230. Co-requisite: EE 310, or consent of instructor

EE 314 ADVANCED PROGRAMMING, MODELING, AND SIMULATION (4)

Lecture, 4 hours. Pointers and dynamic allocation of storage, linked lists, an introduction to the object oriented programming (OOP) paradigm, classes and objects, encapsulation, member variables and member functions. Static arrays, dynamic arrays, stacks and queues, linked lists, trees, binary search trees, balanced trees (AVL, red-black, B-trees), heaps, hashing, and graphs. System modeling techniques and applications such as generation of noise (random numbers) and correlated signal with different pdfs, measurement of statistical parameters like moments, queuing systems, and system simulation. Prerequisite: CS 115 and EE 220, or consent of instructor.

EE 330 ELECTRONICS II (2)

Lecture, 1 hour, lab, 3 hours. Output stage design of the amplifiers, non-linear op-amp circuits, differential amplifiers, common mode and differential mode circuit analysis, half-circuit analysis, study of current mirrors and active load design, analysis of two stage active load CMOS op-amp, high frequency models of BJT and MOSFET, analysis of low and high frequency responses of amplifiers, open circuit time constant (OTC) and short circuit time constant (STC), study of tuned amplifier. Prerequisite: EE 230 and MATH 241 or consent of instructor.

EE 345 PROBABILITY AND STATISTICS FOR ENGINEERS (3)

Probability and its axioms, conditional probability, sequential experiments, independence, counting, discrete, continuous and mixed random variables and distributions, functions of random variables, expectations, multiple random variables and joint distributions, central limit theorem, weak law of large numbers, estimation of random variables, random processes and their characterization. Prerequisite: MATH 241, or consent of instructor.

EE 400 LINEAR SYSTEMS THEORY (3)

Lecture, 3 hours. Analysis of linear time-invariant systems, correlation, convolution, impulse response, complex variables, Fourier series and transform, sampling, filtering, modulation, stability and causality, feedback and control systems, Laplace and Z-transform, and fast Fourier transforms. Prerequisite: MATH 241 and MATH 211, or consent of instructor. Cross-listed as MATH 430 and CES 400.

EE 430 ELECTROMAGNETIC THEORY AND APPLICATIONS (3)

Lecture, 3 hours. Electrostatics, magnetostatics, electric currents, electromagnetic induction, electric and magnetic fields in matter, Maxwell's equations, retarded potentials radiation reaction, light emission, simple scattering and antenna theory, properties of waveguides, relativistic formulation of electrodynamics, Fourier decomposition of fields. Prerequisites: EE 330, MATH 241 and MATH 261. Cross-listed as PHYS 430.

EE 432 PHYSICAL ELECTRONICS (3)

Lecture, 3 hours. Semiconductor materials, crystal structure and growth; energy bands and charge carriers, conductivity, and mobility; metal-semiconductor and p-n junctions; p-n junction diodes, bipolar junction transistors, field-effect transistors, CCD's, photonic devices, and integrated circuits. Projects in photolithography; conductivity and contact resistance measurements; I-V and C-V characteristics of diodes and characterization of transistors may be assigned. Prerequisite: EE 230 or consent of Instructor. Cross-listed as PHYS 475 and CES 432.

EE 440 ANALOG AND DIGITAL COMMUNICATIONS I (3)

Lecture, 2 hours; laboratory, 3 hours. Mathematical modeling of signals, time and frequency domain concepts, spectral density, components of a communications system, and analog signal transmission. AM, FM, and PM modulation and demodulation techniques; noise and bandwidth; link analysis. Laboratory work. Prerequisites: EE 230 and EE 400, or consent of instructor.

EE 441 ANALOG AND DIGITAL COMMUNICATIONS II (3)

Lecture, 2 hours; laboratory, 3 hours. Digital signals and their transmission, PCM, log-PCM, ADPCM and DM, and other low bit rate coders. Digital data transmission, data encoding, clock recovery and BER, data modulation techniques, ASK, FSK, PSK, and QAM. Link budgets for satellite, cellular, and cable systems; the effects of noise and bandwidth. Laboratory work. Prerequisites: EE 314 and EE 440 or consent of instructor.

EE 442 ANALOG AND DIGITAL COMMUNICATIONS (3)

Lecture, 3 hours; laboratory, 3 hours. Mathematical modeling of signals, time and frequency domain concepts, spectral density, components of a communications system, and analog signal transmission. Analog modulation and demodulation techniques, FDM, noise and bandwidth; Digital signals and their transmission, PCM and low bit rate coders, TDM, data encoding for efficient baseband digital transmission, digital data modulation and demodulation, bit errors. Prerequisites: EE 230 and EE 400, co-requisite EE 442L or consent of instructor.

EE 442L ANALOG AND DIGITAL COMMUNICATIONS LAB (1)

Laboratory work covers various analog and digital communication elements, and modulation, and demodulation techniques. Prerequisite: EE 230 and EE 400. Co-requisite: EE 442, or consent of instructor

EE 443 INTRODUCTION OPTICAL FIBER COMMUNICATIONS (3)

Lecture, 3 hours. Principles of light wave propagation, and propagation in an optical fiber, fiber characteristics, O/E and E/O conversions, coupling, WDM, modulation techniques for efficient information transmission, and system design. Prerequisite: EE 430; Co-requisite: EE 442 or consent of the instructor.

EE 444 INTRODUCTION TO RF COMMUNICATIONS (3)

Principles of transmission line theory, scattering matrix methods, impedance matching, waveguides, microstrip, coplanar lines, couplers, detectors, antennas, RF filters, RF amplifiers, passive RF/ microwave devices (mixers, diplexers, etc.), RF/microwave communications link design, system noise and distortion, common wireless protocols. Prerequisite: (EE 442 and ES442L) or EE 430, or consent of instructor.

EE 445 PHOTONICS (3)

Lecture, 3 hours. Gaussian beams; guided-wave optics; fiber optics; optical resonators; resonant cavities; laser oscillation and amplification; laser excitation; optical pumping; solid state, gas, dye, chemical, excimer, and free electron lasers; semiconductor lasers; laser spectroscopy; fiber optic communication; photomultiplier and semiconductor radiation detectors including photoconductors and junction photodiodes; p-i-n diodes and avalanche photodiodes; detector noise. Prerequisite: PHYS 314 or consent of Instructor. Cross-listed with PHYS 445 and CES 430.

EE 465 INTRODUCTION TO NETWORKING AND NETWORK MANAGEMENT (2)

This course offers a working knowledge of IP addressing, TCP and UDP, the ISO reference model, MAC and Ethernet, LAN, MAN, WAN, routing protocols, application protocols, including, client-server model, web protocols, file transfer protocol, and email, and network elements such as repeaters, bridges, routers, and switches. Prerequisites: (EE 314 or CS 315) and EE 442; co-requisite EE 465L, or consent of Instructor. (Cross-listed with CES 440)

EE 465L INTRO. TO NETWORKING AND NETWORK MANAGEMENT LAB (1)

This laboratory emphasizes on network concepts and protocols through configuring a network using networking elements and PCs, observing the actual behavior of the overall network, and analyzing and evaluating the results. Prerequisites: (EE 314 or CS 315) and EE 442, co-requisite EE 465, or consent of Instructor. (Cross-listed with CES 440)

EE 480 ARTIFICIAL INTELLIGENCE (3)

A survey of techniques that simulate human intelligence. Topics may include: pattern recognition, general problem solving, adversarial game-tree search, decision-making, expert systems, neural networks, fuzzy logic, and genetic algorithms. Prerequisite: EE 314 or consent of Instructor.

EE 485 SELECTED TOPICS IN ENGINEERING SCIENCE (1-3)

A course on a single topic or set of related topics not ordinarily covered in the Engineering Science curriculum. The course may be repeated for credit as topics vary. Prerequisite: consent of instructor.

EE 486 SELECTED LABORATORY TOPICS IN ELECTRICAL ENGINEERING (1)

Laboratory, 3 hours. A laboratory-based course on a single or set of related topics not ordinarily covered in the engineering science curriculum. Topics include LabVIEW, FPGA, and RF Instruments. The course may be repeated for credit as topics vary. Prerequisite: Upper-division standing and consent of instructor.

EE 492 SENIOR DESIGN PROJECT PLANNING (1)

Senior Design Project Planning calls on the professional skills of the discipline; it draws on the core disciplines of the students' major field of study, as well as exploring necessary topics such as scheduling, organization, budgeting, prototyping, develop teamwork, customer liaison skills, employ creativity in proposing new solutions, and so forth. Hence, by the end of the capstone process students are expected to have a good understanding about various design phases, including analysis phase, a design phase, a validation phase and a production phase. Prerequisite: EE 310 and 330 and Senior standing, or consent of the instructor.

EE 493 SENIOR DESIGN PROJECT (3)

This is a capstone course. A major project designed to bring the knowledge gained from various courses together to analyze, design, and implement an electronic and/or communications system in an efficient and economic manner. Prerequisite: EE 492, or consent of the instructor.

EE 497 ENGINEERING SCIENCE COLLOQUIUM (1)

Lecture, 1 hour. Series of lectures on topics of interest in the relevant fields of engineering. A maximum of 1 unit can be applied to the ES major. The students may not miss more than two presentations. A brief summary of each presentation must be submitted after the presentation. The course grade is decided on evaluation of these reports. Cr/NC only. Prerequisite: Consent of the instructor only. Permission required.

EE 498 ENGINEERING PRACTICUM (1-4)

Under the faculty instructor's supervision, engineering juniors and seniors take this service learning training to further their practical engineering experience. A specific assignment is given by the instructor to each student for assisting the class to learn either in class or labs. Regular meetings with the instructor necessary keep track of progress of the assignment and evaluate the student's learning. The course is CR/NC only. Pre-requisite: junior or senior standing. Consent of instructor required.

Engineering Science (ES)

ES 101A COMMUNICATION IN THE DIGITAL AGE (3)

Concept of digital age, technology, and modern communications, understanding various routinely used technical terms and commonly known computer and communications components and devices; understanding digital voice, video and data communication, mobile communication, and communication through internet; ill effects such as radiation, invasion of privacy, unethical usages and protection from them; assessment of learning. (The companion laboratory course ES 101B is strongly recommended; the course does not apply to ES major). Prerequisite: GE math eligibility. This course meets GE Area B3 requirement.

ES 101B COMMUNICATION IN THE DIGITAL AGE LABORATORY (1)

Laboratory to demonstrate the concepts discussed in the course ES 101A and give hands-on experience to the students. (Does not apply to the ES major). Co-requisite: ES 101A, or permission of the instructor. This course meets the GE science laboratory requirement.

ES 210 DIGITAL CIRCUITS AND LOGIC DESIGN (4)

Students learn how to analyze and evaluate scientific, inductive and deductive reasoning, through digital logic and its application to logic gates and digital electronic circuits. Laboratory work includes designing, building and testing of digital circuits and designs. Project assignments require students present their own design and the final product in public, making persuasive presentations with efficient verbal and non-verbal skills, and listening to peers critiques for improvement. This course fulfills GE A3. Prerequisites: ES 112, Co-requisite: ES 230, or consent of instructor.

ES 345E ENGINEERING APPLICATIONS OF PROBABILITY THEORY (1)

Lecture, 1 hour. This is a one-unit course introducing how to apply probability theory to model engineering problems, particularly in communications and networking areas. Topics covered include application of probability to measure of information and redundancy, moments to measure power, correlation to determine correlation function, power spectrum and linear prediction, and estimation of statistical parameters. Co-requisite: math 345E or consent of instructor.

ES 495 SPECIAL STUDIES (1-4)

May be repeated for credit up to 8 units.