

**5630. Adaptive Signal Processing.** 3 hours. Provides students with fundamental knowledge of modern adaptive signal processing theorems and algorithms and their applications in radar and wireless communications. Search algorithms, LMS, RLS adaptive filtering, adaptive signal modeling and applications. Prerequisite(s): EENG 2620, 3910 or equivalent.

**5640. Computer Vision and Image Analysis.** 3 hours. Introduction to computer vision and image processing, image geometry and photogrammetry, edge detection, feature extraction, shape representation, structural descriptions, object modeling, shape matching, semantic knowledge bases and imaging architectures, depth perception with stereo and photometric stereo, moving scene analysis and object tracking, multi-sensor data fusion, occluded object recognition by multi-sensor/multi-view integration, Computer vision applications.

**5810. Digital Communications.** 3 hours. Decision theory, signal space, optimal receivers, modulation schemes, error performance, bandwidth, channel capacity, block coding, convolutional coding, trellis coded modulation, inter-symbol interference, fading channels and spread spectrum. Prerequisite(s): EENG 3810 or equivalent. (Same as C SCE 5570.)

**5820. Wireless Communications.** 3 hours. Fundamentals of wireless communications. Topics covered include radio propagation channel characteristics and models, modulation, coding and receiver signal processing techniques in fading channels, multiple access techniques for wireless systems, fundamentals of wireless networks, and major cellular and wireless LAN standards. Prerequisite(s): EENG 5810 or equivalent. (Same as C SCE 5510.)

**5830. Coding Theory.** 3 hours. Channel coding theorem, error-correcting codes, algebraic block codes, linear codes, BCH codes, convolutional codes, burst-error correcting codes, and design of encoders and decoders. Prerequisite(s): EENG 3810 or equivalent.

**5890. Directed Study.** 1–3 hours. Study of topics in electrical engineering. The student should prepare a plan for study of a topic and a plan for evaluation of study achievements. Open to students with graduate standing who are capable of developing problems, independently. May be repeated for credit. Prerequisite(s): consent of department.

**5900. Special Problems.** 1–3 hours. Independent research of a specific problem in a field of electrical engineering. A report is required defining the problem and a solution. Prerequisite(s): consent of department.

**5950. Master's Thesis.** 3–6 hours. To be scheduled only with consent of department. No credit assigned until thesis has been completed and filed with the School of Graduate Studies. Prerequisite(s): consent of department.

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## Electronics Engineering Technology

see Engineering Technology

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## Elementary Education

see Teacher Education and Administration

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## Emergency Administration and Planning

see *Undergraduate Catalog*

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## Engineering Technology

**Construction Engineering Technology** – see *Undergraduate Catalog*

### Electronics Engineering Technology, ELET

**5300. Embedded Controllers.** 3 hours. (2;2) The study of the technical aspects of real-time software systems: software development methodologies, operating system and real-time kernel concepts.

**5310. Industrial Process Controls.** 3 hours. (2;2) Use of programmable controllers and microcomputers as controllers in industrial processes; topics include sensors and transducers, data acquisition, control devices and the nature of digital control.

**5320. Introduction to Telecommunications.** 3 hours. An introduction to the technology, standards, systems and practices of the telecommunications industry to include equipment, switched and dedicated communications lines, and voice and data communications.

**5330. Instrumentation System Design.** 3 hours. (2;2) The major objectives of this course are instrumentation design techniques, transducer selection, and interfacing control and measurement signals to the system. The use of graphical and structured programming techniques in the design of virtual instrument systems will constitute a significant portion of the course. Completion of a capstone project incorporating a summation of learning experiences from the entire curriculum is a requirement of the course. Must be taken the last term/semester offered prior to graduation. Prerequisite(s): completion of ELET required courses; course is to be taken within the last 12 hours of the degree plan.

**5340. Digital Logic Design Techniques.** 3 hours. (2;2) Study of the design, simulation and implementation of digital logic circuits including combinational and sequential logic, algorithmic state machines, hardware test techniques, software used in design, simulation and an introduction to the use of VHDL programming language. Oral and written documentation required.

**5800-5810. Studies in Engineering Technology.** 1–3 hours. Organized classes specifically designed to accommodate the needs of students and the demands of program development that are not met by regular offerings. Short courses and workshops on specific topics, organized on a limited-offering basis, to be repeated only upon demand. May be repeated for credit.

**5900-5910. Special Problems.** 1–3 hours. Open to graduate students capable of developing a problem independently.

**Engineering** – see *Undergraduate Catalog*

### Engineering Technology, Master's Courses, MSET

**5000. Orientation to Engineering Technology.** 1 hour. Review of policies and procedures of the engineering technology program, department, college and university regarding graduate studies. Formation of graduate committee and selection of major adviser. Development and submission of degree plan. Review of thesis procedures including library utilization, available programs of study and current faculty departmental research. Procedures and responsibilities of assistantships and scholarships. Determination of technical writing ability.

**5010. Seminar in Engineering Technology.** 3 hours. In-depth examination of current theories, research, trends and processes of industry. Readings, individual study and research, information exchange and guest lectures provide an understanding of selected industrial topics. May be repeated for credit.

**5020. Industrial Research.** 2 hours. A study of industrial analytical techniques used to develop new products and new technologies, including the use of engineering software for design purposes.

**5040. Analytical Methods for Engineering Technology.** 3 hours. Procedures for confidently detecting variances from specification in manufactured products; applications of matrix manipulations for multivariate analysis, engineering applications of residues calculated from circular integrals, integration and differentiation of three-dimensional engineering functions.

**5800-5810. Studies in Engineering Technology.** 1–3 hours each. Organized classes specifically designed to accommodate the needs of students and the demands of program development that are not met by regular offerings. Short courses and workshops on specific topics, organized on a limited-offering basis, to be repeated only upon demand. May be repeated for credit.

**5900-5910. Special Problems.** 1–3 hours each. Open to graduate students capable of developing a problem independently.

**5950. Master's Thesis.** 3 or 6 hours. To be scheduled only with consent of department. 6 hours credit required. No credit assigned until thesis has been completed and filed with the graduate dean. Continuous enrollment required once work on thesis has begun. May be repeated for credit.

**General Engineering Technology** – see *Undergraduate Catalog*

**Manufacturing Engineering Technology** – see *Undergraduate Catalog*

### **Mechanical Engineering Technology, MEET**

**5030. Product Design and Development.** 3 hours. Formal development of the process of designing a product, including ideas generation, engineering development, modeling and analysis, and project planning and management.

**5100. Nontraditional Manufacturing Processes.** 3 hours. Analysis of selected contemporary and emerging manufacturing/production processes utilizing high-level automation, productivity-enhancing technologies and/or specialty technologies; emphasis on process structure, organization, economics and application within the industrial environment.

**5120. Computer-Integrated Manufacturing.** 3 hours. (2;2) Computerization in manufacturing/production from an integrated systems perspective; emphasis on selected contemporary and emerging applications such as design/documentation, engineering analysis, process planning, machine tool programming, automated material handling and inspection, and factory networking.

**5130. Product Reliability and Quality.** 3 hours. Processes and techniques of assuring the quality of industrial products; reliability and maintainability, sampling probability and statistical process control; quality control management.

**5150. Applications of Electron Microscopy and Failure Analysis.** 3 hours. (2;2) Scanning and transmission electron microscopy applications in failure analysis will be discussed along with ductile, brittle, fatigue and corrosion related failure mechanisms. Applications of fracture mechanics, elevated temperature failures of welded and cast components will be discussed.

**5800-5810. Studies in Engineering Technology.** 1–3 hours. Organized classes specifically designed to accommodate the needs of students and the demands of program development that are not met by regular offerings. Short courses and workshops on specific topics, organized on a limited-offering basis, to be repeated only upon demand. May be repeated for credit.

**5900-5910. Special Problems.** 1–3 hours. Open to graduate students capable of developing a problem independently.

**Nuclear Engineering Technology** – see *Undergraduate Catalog*

## English

### **English, ENGL**

**5000. Old English.** 3 hours. A study of Old English grammar and phonology; the reading of selections from prose and poetry in West Saxon; a survey of the literature of the Old English period. Prerequisite(s): 12 semester hours in advanced English, including a course from Group D. See *Undergraduate Catalog* for Group D course listing.

**5010. Beowulf.** 3 hours. A study of *Beowulf*, its language and its place in the Germanic epic tradition; some attention to other heroic poetry. Prerequisite(s): ENGL 5000.

**5030. Studies in Medieval Literature.** 3 hours. A detailed study of the works of one or more of the major writers or literary genres of the medieval period in England, with a study of the major literary and social forces that helped to shape the cultural context of the period.

**5100. Studies in British Literature of the Romantic Period.** 3 hours. A detailed study of the work of one or more of the major Romantic poets, together with wide reading in the general literature of the period.

**5140. Form and Theory: Poetry.** 3 hours. Rhetorical criticism of poetry to show how poems achieve identification with the audience; emphasis on student mastery of critical analysis.

**5145. Form and Theory: Prose.** 3 hours. Rhetorical criticism of prose fiction to show how short stories and novels achieve effect.

**5162. Creative Writing: Essay.** 3 hours. A close analysis of the contemporary essay; writing of essays using rhetorical principles in conjunction with invention, humor and polemics. Prerequisite(s): by permission of the department.

**5170. Rhetorical Theory.** 3 hours. A consideration of rhetorical theory from the Greeks to modern times. Emphasis upon 20th-century advances and innovations. The relationship between literary criticism and rhetorical theory; persuasive techniques in literary discourse; the place of rhetorical theory in the teaching of writing.

**5200. Studies in British Literature of the Victorian Period.** 3 hours. A study of the works of one or more of the major British writers of the Victorian period and of the intellectual and philosophical interests of the time.

**5250. Studies in British Literature of the Eighteenth Century.** 3 hours. An appraisal of a significant group of writers or a literary genre of either the Restoration or the 18th century, together with attention to the historical, intellectual and social background.

**5260. Studies in Nineteenth-Century British Literature.** 3 hours. A detailed survey of the works of the Romantic and Victorian periods, with a general consideration of social and intellectual interests of the time.

**5400. Studies in Shakespeare.** 3 hours. An intensive study of selected plays and a consideration of some of the literary problems connected with Shakespeare's life and work.

**5410. Studies in the British Renaissance.** 1–4 hours. A study of the works of one or more major authors of the 16th and 17th centuries and of the intellectual, philosophical and religious life of the time.