

6320. Computing Applications for Special Populations. 3 hours. Focus on instructive and adaptive applications of computer technology to the educational and life needs of individuals with exceptional learning, cognitive and/or behavioral characteristics. Issues related to equity and accessibility are discussed. Prerequisite(s): consent of department.

6410. Theoretical Issues in Learning Disabilities. 3 hours. Analysis of the theoretical issues surrounding a life-span approach to learning disabilities. Emphasis is on the cognitive, social and neuropsychological research applicable to learning disabilities. Educational implications of the research also are addressed.

6440. Research Issues in Special Education. 3 hours. Analysis of current research issues and problems unique to exceptional populations. Content includes design, methodology and statistical topics. Prerequisite(s): EDSP 6270, 6310, 6410; EPSY 6010 and 6210, or consent of department.

6800. Topics in Special Education. 3 hours. Organized seminars designed to accommodate the needs of post-master's level students and the demands of program development that are not met by regular course offerings. Examples of topics that may be covered include: issues related to aggression and violence; implications for prevention and treatments; and strategies to address the needs of diverse learners with special needs and their families. Short courses and special seminars on specific topics organized on a limited-offering basis. May be repeated for credit.

6900-6910. Special Problems. 1-3 hours each. Research by doctoral students in fields of special interest. Includes project research studies and intensive reading programs. Conferences with professors in the fields also are included.

6950. Doctoral Dissertation. 3, 6 or 9 hours. To be scheduled only with consent of department. 12 hours credit required. No credit assigned until dissertation has been completed and filed with the graduate dean. Doctoral students must maintain continuous enrollment in this course subsequent to passing qualifying examination for admission to candidacy. May be repeated for credit.

Special Education Courses Offered at Texas Woman's University

Students wishing to enroll in the following TWU courses will do so through a cross-registration mechanism administered by the School of Graduate Studies at UNT.

EDUC 6023. Practicum in Assessment and Evaluation of Individuals with Disabilities. Required of all doctoral students in special education; administration and interpretation of educational, communicative, audiological and psychological tests given to individuals with disabilities. 7 laboratory hours a week. Prerequisite(s): proficiency in tests and measurements and permission of instructor. May be repeated for credit.

EDUC 6103. Social, Psychological and Educational Aspects of Mental Retardation and Developmental Disabilities. Advanced study of etiology, remediation and education of individuals with mental retardation and developmental disabilities. 3 lecture hours a week. Prerequisite(s): EDUC 5103 or equivalent courses in the area and permission of instructor.

EDUC 6333. Seminar in Emotional and Behavioral Disorders. Study of adjustment and emotional problems in individuals assigned to various least restrictive environments. Research related to etiology, conceptual models and interventions. 3 lecture hours a week. Prerequisite(s): EDUC 5303 or equivalent courses and permission of instructor.

EDUC 6403. Seminar in Learning Disabilities. Advanced study of physical, psychological and environmental causes of learning disabilities, and interrelationships among the causes. 3 lecture hours a week. Prerequisite(s): EDUC 5443 or equivalent courses in the area and permission of instructor.

EDUC 6423. Seminar in Policies and Procedures of Special Education Administration. Theory, research and practices related to special education administration. Analysis of administrative behavior, the process of decision making, special education leadership and organization changes, models of state and federal funding, budgeting, litigation procedures and program evaluation. 3 lecture hours a week. Prerequisite(s): EDUC 5603 or equivalent courses in the area and permission of instructor.

EDUC 6723. Practicum. 3-12 hours. Field placement. Type of placement will vary with student's area of major concentration and past experiences. Prerequisite(s): 12 semester hours of doctoral credit or permission of instructor.

EDUC 6903. Special Topics. Variable content; topics selected as needed. 3 lecture hours a week.

Electrical Engineering

Electrical Engineering , EENG

5310. Control Systems Design. 3 hours. Control systems analysis, modeling and design constraints, goals, and performance specifications, state-space analysis of linear systems; Root-locus, frequency response and state-space design methods; MATLAB simulations; system stability-introduction to Lyapunov methods; controllability; observability; canonical forms and minimal realizations, fundamentals of feedback control dynamic programming and the Hamilton-Jacobi-Bellman equation; synthesis of optimum state regulatory systems; introduction to the minimum principle, necessary conditions for optimal trajectories; minimum principle for bounded controls, and time-optimal control of linear systems. Prerequisite(s): EENG 2620 or equivalent.

5520. Design and Testing of Digital Systems. 3 hours. Review of combinational logic, testing combinational circuits, sequential circuit synthesis, state minimization, state assignment, and structure of sequential circuits; state identification and fault detection experiments; testing of sequential circuits and design for testability. Prerequisite(s): EENG 2710 or equivalent.

5530. Analog Integrated Circuit Design. 3 hours. This course thoroughly investigates the fundamentals in design and analysis of analog and mixed-signal integrated circuits. Topics include analog MOS transistor models, current sources and sinks, circuit reference, amplifier, feedback amplifiers, differential amplifiers and operational amplifiers. Prerequisite(s): EENG 3520 or equivalent.

5610. Digital Signal Processing. 3 hours. Introduction to modern digital signal processing theory and techniques. Topics covered include discrete time signals and systems, sampling theorem, Z-transform, frequency analysis of signals and systems, discrete Fourier transform, fast Fourier transform algorithms, digital filter design, and multi-rate digital signal processing. Prerequisite(s): EENG 2620 or equivalent.

5620. Statistical Signal Processing. 3 hours. Introduction to detection and estimation theories. Vector space, multivariate normal distribution, quadratic forms, sufficiency and minimum variance unbiased estimator, hypothesis testing, Neyman-Pearson detection theory, Bayesian detection theory, maximum-likelihood estimation, Cramer-Rao bound, Bayesian and minimum mean-squared error estimators, Kalman filter, least-squares estimation, singular value decomposition algorithm. Prerequisite(s): EENG 4610 and MATH 6810 or equivalent.

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 CSCE 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 CSCE 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.

5932. Internship. 1–3 hours. Supervised work in a job that meets specific educational objectives of the department and is beneficial to the student's career development. Required submission of a final report summarizing industrial experience gained through the internship. 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.

Electrical Engineering Technology

see *Undergraduate Catalog*

Elementary Education

see Teacher Education and Administration

Emergency Administration and Planning

see *Undergraduate Catalog*

Engineering Technology

Construction Engineering Technology – see *Undergraduate Catalog*

Electronics Engineering Technology – see *Undergraduate Catalog*

Engineering Technology – see *Undergraduate Catalog*

Engineering Systems, Master's Courses, MSES

5010. Seminar in Engineering Systems. 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. Design of Experiments. 3 hours. A study of industrial analytical techniques used to develop new products and new technologies, including the use of engineering software for design purposes.

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.

5040. Analytical Methods for Engineering Systems. 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 3-dimensional engineering functions.