Engineering Technology

Construction Engineering Technology, CNET

1160. Construction Methods and Materials I. 3 hours. (2;3) Introduction to the materials, systems, methods and procedures of building construction.

2160. Construction Methods and Materials II. 3 hours. (2;3) Contemporary methods and materials used in the construction industry; nature, use and characteristics of materials; construction methodology, application and sequencing in the building process. Prerequisite(s): CNET 1160.

2170. (ENGR 1307) Plane Surveying. 1 hour. (1;1) Surveying principles, instruments, measurements and calculations; fundamentals of surveying for building construction; survey drawings and mapping. Prerequisite(s) CNET 1160.

2300. Architectural Drawing. 2 hours. (2;2) Emphasizes architectural details; home planning. Prerequisite(s): CNET 1160.

2900. Special Problems. 1-4 hours.

3150. Construction Contract Documents. 2 hours. Interpretation of construction drawings; architectural, structural, mechanical, electrical and landscaping documents; development, interpretation and implementation of specifications and other construction documents. Prerequisite(s): CNET 2170.

3160. Construction Cost Estimating I. 3 hours. Procedures, techniques and systems of construction cost estimating. Includes work classification, quantity detailing, specification interpretation and bid preparation. Prerequisite(s): CNET 1160 and 2300.

3190. Construction Scheduling. 3 hours. Study of construction scheduling utilizing current techniques including Critical Path Method (CPM), the Precedence Method (PM), the Program Evaluation and Review Technique (PERT) and a probabilistic method. Prerequisite(s): CNET 3160.

3410. Occupational Safety and Liability. 3 hours. Study of basic concepts of accident prevention, safety education, economic impact and environmental hazard control. Includes OSHA regulations and other regulations as they relate to the employer, the employee and the public.

3420. Industrial Materials Testing. 3 hours (2;2) Study of the nature, properties, processing, production, testing and use of industrial materials. Laboratory work involves the study, observation, testing and experimentation with industrial materials and processes. Prerequisite(s): ENGR 2220 or consent of department.

4170. Construction Management. 3 hours. Planning, organizing, scheduling and managing construction projects. Includes preconstruction planning, cost and quality control, materials procurement, subcontractor management, start-up and close-out. Prerequisite(s): CNET 3160.

4180. Problems in Project Management. 3 hours. Construction project management simulation involving bid preparation, cost control, scheduling, contract preparation, construction documents interpretation, punchlist management and project evaluation. Prerequisite(s): CNET 4170.

4790. Senior Design. 2 hours (1;3) Project teams specify, plan, design, implement, test and demonstrate an electronic product or process. Oral and written documentation required. Projects to be supplied by local industry whenever possible. Prerequisite(s): CNET 3150, 3190, 3410, 4170 or consent of department.

4900-4910. Special Problems. 1-4 hours each.

4920. Cooperative Education Internship. 1 hour. Supervised industrial internship requiring a minimum of 150 hours of work experience. Prerequisite(s): consent of department.

Electronics Engineering Technology, ELET

2720. Digital Logic. 4 hours. (3;3) Digital logic circuits and techniques. Analysis, design and simulation of combinational and sequential systems using: classical Boolean algebra techniques, laboratory hardware experiments and computer simulation. Introduction to programmable logic devices (PLDs) and application-specific integrated circuits using CASE tools. Prerequisite(s): CSCE 1020.

2750. Introduction to Microprocessors. 4 hours. (3;3) The fundamentals of microprocessor hardware and assembly language interaction are studied in detail. Emphasis is on the use of the processor to control external systems and devices. Prerequisite(s): ELET 2720, ENGL 2700 and GNET 2060.

2900. Special Problems. 1-4 hours.

3700. Circuit Analysis. 3 hours. Application of LaPlace transforms and switching functions to the solution of complex electronic circuits and networks in both transient and steady state. Block diagrams and transfer functions are included as well as the use of computer solutions. Prerequisite(s): ENGR 2405 and MATH 1720.

3720. Electronics I. 4 hours. (3;3) Introduction to semiconductors with emphasis on terminal characteristics; diodes, bipolar junction transistors and field effect transistors. The principle of power supplies. Small signal analysis and modeling techniques. Bias stabilization and feedback are included. Prerequisite(s): ENGR 2405 and MATH 1720.

3740. Electronics II. 4 hours. (3;3) Electronic amplifiers using bipolar junction transistors and field effect transistors. Frequency response and compensation of these devices. The use of design of operational amplifiers in control and instrumentation circuits. Prerequisite(s): ELET 3720.

3750. Digital Systems. 4 hours. (3;3) The use of microcomputers in control and instrumentation systems, including interfacing in real time. Data communications, multiplexing, digitizing and sampling techniques are covered. Prerequisite(s): ENGR 2405 and ELET 2750.

3760. Design of DSP Systems. 4 hours. (3;3) Introduction to digital signal processing, emphasizing digital audio applications. A DSP primer covering important topics such as phasors, the wave equation, sampling and quantizing, feedforward and feedback filters, periodic sound, transform methods, and filter design. The course will use intuitive and quantitative approaches to develop the mathematics critical to understanding DSP techniques. Prerequisite(s): ELET 3700 and 3750.

3970. Electronic Devices and Controls. 3 hours. (2;3) Fundamentals of solid state electronic devices; their applications in amplifiers, digital logic, industrial controls and instrumentation; feedback and stability of electronic systems. Prerequisite(s): ENGR 2405.

4710. High Frequency Systems I. 4 hours. (3;3) Receiver and transmitter circuits and systems; antennas, modulation, detection, high frequency oscillators and tuned amplifiers. Prerequisite(s): ELET 3700 and 3740.

4720. Control Systems. 4 hours. (3;3) Classical control theory; block diagrams, applications of LaPlace transforms, stability criteria and feedback. Use of computer software to evaluate complex systems. Prerequisite(s): ELET 3700 and 3740.

4770. High-Frequency Systems II. 4 hours. (3;3) Microwave techniques and systems; measurements in the UHF spectrum, transmission lines, Smith charts, computer analysis and satellite communications. Prerequisite(s): ELET 4710.

4790. Senior Design. 2 hours. (1;3) Project teams specify, plan, design, implement, test and demonstrate an electronic product or process. Oral and written documentation required. Projects to be supplied by local industry whenever possible. Prerequisite(s): ELET 4720 and ELET 4770 (or concurrent enrollment).

4900-4910. Special Problems. 1-4 hours each.

4920. Cooperative Education. 1 hour. A supervised industrial internship requiring a minimum of 150 hours of work experience. Prerequisite(s): consent of department.

4940. Electrical Power Generation and Transmission. 3 hours. Electric energy production and transmission, including AC generator construction and operation, power transformers, transmission lines, and load-flow analysis; system modeling and computer applications. Prerequisite(s): ENGR 2405.

Engineering, ENGR

1304 (ENGR 1304). Engineering Graphics. 3 hours. (1;4) Fundamentals and principles of engineering drafting practices used in technical processes.

2301 (ENGR 2303). Statics. 3 hours. Introduction to mechanics of materials, concurrent, parallel and non-concurrent forces in equilibrium; free body diagrams, moments, centroids, and friction; beam design and columns. Prerequisite(s): PHYS 1710 and 1730 and MATH 1710.

2302 (ENGR 2302). Dynamics. 3 hours. Analysis of bodies in motion; kinematics and kinetics of particles, systems of particles and rigid bodies. Prerequisite(s): ENGR 2301 and MATH 1720.

2332. Mechanics of Materials. 3 hours. (2;3) Relationships among loads placed on structural components; shape and size of components; resultant stresses, strains and deflections of components. Prerequisite(s): ENGR 2301.

2405. Fundamentals of Electrical Engineering. 4 hours. (3;3) Instructional program that prepares individuals to apply mathematical and scientific principles to the design, development and operational evaluation of electrical, electronic and related communications systems and their components, including electrical power generation systems. Analysis of problems such as superconduction, wave propagation, energy and retrieval, and reception and amplification. Prerequisite(s): MATH 1720 and PHYS 2220/2240.

General Engineering Technology, GNET

1030. Technological Systems. 3 hours. Introduction to technological systems with focus on societal interrelationships; past, present and future trends; and influence and impact on technological literacy. *Satisfies the Social and Behavioral Sciences requirement of the University Core Curriculum.*

2060. Professional Presentations. 3 hours. (2;3) Oral and written communication techniques to include conceptualization, design, development and delivery with special reference to engineering/science related technical material. Content will address speaker support materials including visuals, speaker note pages, interactive software and audience and handouts using industrial graphics computer software. Prerequisite(s): ENGL 1320 or ENGL 2700. *Satisfies the Communication requirement of the University Core Curriculum.*

2900. Special Problems. 1-4 hours.

4900-4910. Special Problems. 1-4 hours each.

Engineering Technology, Master's Courses – see *Graduate Catalog*

Manufacturing Engineering Technology, MFET

2100. Manufacturing Processes and Materials. 3 hours. (2;2) Comprehensive study of conventional manufacturing tools, equipment and processes. Major focus on selected industrial materials, hot and cold forming, heat treatment, plastic processing techniques, chip removal techniques, fusion welding and manufacturing planning.

2900. Special Problems. 1-4 hours.

3110. Machining Principles and Processes. 4 hours. (3;3) Machine tool manufacturing techniques emphasizing sequence of operations, cutting tool geometry, tooling systems, tool materials and performance characteristics, cutting forces, speeds, feeds, surface finish, horsepower calculation and cutting fluids. Prerequisite(s): MFET 2100 and MATH 1650.

3250. Plastic Materials and Processes. 3 hours. (2;3) Characteristics and application of major resins and composites. Emphasis is on: properties, organic matrix composites, industrial processing techniques, and design using plastics and composites. Prerequisite(s): MFET 2100 and CHEM 1410/1430.

3450. Engineering Materials. 3 hours. (2;3) Principles of bonding, structure, and structure/property relationships for metals and their alloys, ceramics, polymers and composites. Emphasis on properties and how processes change structure and, consequently, properties. Prerequisite(s): MFET 2100, MATH 1710, CHEM 1410/1430.

3510. Electronic Properties of Materials. 4 hours. (3;3) Introduction to the electronic structure and properties of crystalline and non-crystalline materials. Band theory is discussed and applied to conducting, semiconducting, and insulating materials. Structure and properties are related. Prerequisite(s): MFET 3450, MATH 1720, PHYS 2220/2240.

3520. Soldering, Brazing and Adhesive Bonding. 3 hours. (2;3) Principles of brazing, soldering and adhesive bonding. Relationships among processing conditions, filler materials and adhesives, base materials, joint geometry, and their influence on joint integrity are examined. Applications to microelectronics emphasized. Prerequisite(s): CHEM 1410/1430, PHYS 1710/1730, MATH 1720.

4190. Quality Assurance. 3 hours. Review of statistics and discussion of statistical process control (SPC). The study of quality management, including preproduction supplier, in-process and finished product quality; methods of statistical analysis and quality audits, costs and employee training. Prerequisite(s): MFET 3110 or consent of department.

4200. Engineering Cost Analysis. 2 hours. Principles and techniques for cost evaluation of engineering design including: labor, material and business accounting analysis; forecasting tools and techniques; operation, product, project and system estimating; and, contract considerations. Prerequisite(s): MFET 4190 and MGMT 3830.

4210. CAD/CAM System Operations. 3 hours. (2;3) CAD/CAM programming, compilation of generic tape files for N/C and CNC machine tools local N/C and CNC part programming and operational techniques, G codes and M codes. Prerequisite(s): MFET 3110, CSCE 1020 and completion of math and science requirements.

4230. CNC Programming and Operation. 4 hours. (3;3) Intermediate-level CAD/CAM techniques; local programming, program editing and operation of Computer Numerical Control machining and turning centers; and local programming, program editing and interfacing of machine-tending robot. Prerequisite(s): MFET 4210.

4510. Industrial Experiment Design. 3 hours. Fundamental concepts involved in the design and analysis of industrial experiments with major emphasis on electronic applications. Common statistical tools with application to engineering; statistical distributions; development and organization of parametric and nonparametric experiments to render statistically significant data; and data analysis methods and reporting techniques. Prerequisite(s): DSCI 3700 and MFET 4190.

4790. Senior Design. 2 hours. (1;3) Project teams specify, plan, design, implement, test and demonstrate a manufacturing product or process. Oral and written documentation required. Projects to be supplied by local industry whenever possible. Prerequisite(s): completion of all required MFET courses or concurrent enrollment.

4900-4910. Special Problems. 1-4 hours each.

4920. Cooperative Education. 1 hour. Supervised industrial internship requiring a minimum of 150 hours of work experience. Prerequisite(s): consent of department.

Mechanical Engineering Technology, MEET

2900. Special Problems. 1-4 hours.

3650. Design of Mechanical Components. 3 hours. Design and selection of machine elements. Prerequisite(s): ENGR 2332.

3660. Applications in Thermal Sciences. 3 hours. Introduction to the basic applications of thermodynamics, fluid dynamics, and heat transfer to energy use, transfer, and conversion. Prerequisite(s): MATH 1720, PHYS 2220/2240 and junior standing.

3940. Fluid Mechanics Applications. 3 hours. (2;2) Study of incompressible fluid mechanics, including pressure, force and velocity; hydraulic fluid power circuits and systems as used in industrial applications. Prerequisite(s): ENGR 2302 and MATH 1720.

3990. Applied Thermodynamics. 3 hours. Principles of energy balance and substance behavior as related to different engineering systems. Topics include gas laws, laws of thermodynamics, relationship between thermodynamics variables, thermodynamic tables and charts, power cycle and various applications. Prerequisite(s): CHEM 1410/1430, MATH 1720 and PHYS 1710/1730.

4050. Mechanical Design. 3 hours. (2;3) Elements, principles and graphic representation techniques of the design process. Design methodology and process in applied engineering design. Design problem identification, refinement and analysis in the development of machines. Prerequisite(s): senior standing and completion of all 3000-level engineering technology courses. Prerequisite(s): MEET 3650.

4350. Heat Transfer Applications. 3 hours. Principles of energy transfer by heat; conduction, free and forced convection, radiation, condensation and boiling heat transfer; combined heat transfer; introduction to heat exchanger; simple numerical techniques and computer applications. Prerequisite(s): MEET 3940, CHEM 1410/1430, MATH 1720 and PHYS 1710/1730.

4360. Experimental Thermal Sciences. 2 hours. (1;3) Designing and conducting experiments in fluid mechanics, hydraulics, thermodynamics and heat transfer. Prerequisite(s): for MFET students, MEET 3660; for MEET students, MEET 3940, 3990 and 4350 or concurrent enrollment.

4790. Senior Design. 2 hours. (1;3) Selected professional level projects in mechanical engineering technology. Oral and written presentation required. Projects to be supplied by industry whenever possible. Prerequisite(s): completion of all required engineering technology courses or concurrent enrollment.

4900-4910. Special Problems. 1-3 hours each.

4920. Cooperative Education. 1 hour. A supervised industrial internship requiring a minimum of 150 hours of work experience. Prerequisite(s): consent of department.

Nuclear Engineering Technology, NUET

2900. Special Problems. 1-4 hours.

3910. Principles of Nuclear Technology. 3 hours. Introduction to nuclear technology and radiation physics; includes sources of radiation, its interaction with matter, and radiation detection and measurement. Prerequisite(s): MATH 1720 and PHYS 2220.

3920. Nuclear Instrumentation and Measurement. 4 hours. (3;2) Measurement of radioactive materials commonly encountered in commercial nuclear facilities; includes engineering and scientific principles, measurement techniques and data analysis. Prerequisite(s): NUET 3910.

3930. Radiation Biology and Safety. 4 hours. (3;2) The interaction of radioactive sources and living organisms; effects of both long- and short-term exposure to radiation; ionizing radiation, detection, measurement, shielding, exposure limiting, radiation handling and disposal. Prerequisite(s): NUET 3910.

4050. Nuclear Reactor Theory. 3 hours. A study of neutron transport theory and neutron diffusion mechanics as applied to nuclear fission and reactor core's criticality analysis and behavior. Multi-region core configurations and group diffusion theory included. Prerequisite(s): MATH 1720 and PHYS 3010/3030. (Same as PHYS 4050.)

4790. Senior Design. 2 hours. (1;2) Solution of real-time engineering problems utilizing computer modeling or laboratory experimentation; includes formal written and oral presentations. Capstone course for nuclear concentration. Prerequisite(s): NUET 3930 and NUET 4050.

4850. Computational Methods for Nuclear Engineering Technology. 4 hours. (3;3) Computer design and analysis for nuclear reactors and shielding. Methodology and theory for codes representative of cross section preparation, criticality calculation, gamma ray shielding and dose estimation from air scattered radiation. Prerequisite(s): NUET 3930, CSCE 1020 or consent of department.

4880. Health Physics and Radiation Protection. 3 hours. (2;3) Study and analysis of current health physics issues, practices and implementation. Radiation protection guides for both external and internal exposure and the methodology for establishing guidelines are explored. Methods of evaluation of effectiveness, environmental sampling and protection methods for monitoring radiation are introduced. Prerequisite(s): PHYS 1710/1730; MATH 1720, or consent of department.

4900-4910. Special Problems. 1-4 hours each.

4920. Cooperative Education. 1 hour. Supervised industrial internship requiring a minimum of 150 hours of work experience. Prerequisite(s): consent of department.

4930. Reactor Engineering Design and Operation. 4 hours. (3;2) Theory and practice of commercial nuclear reactor operation; includes neutron distribution in space and energy, design of conduction and convective heat transfer systems, and the design of reactor shielding. Prerequisite(s): NUET 3920 and PHYS 4050.

4970. Modern Power Plant Design and Operation. 3 hours. Study and analysis of modern power plant engineering and technology including fossil and nuclear fueled. Heat generated mechanical and electrical power operations with alternative energy resources. Prerequisite(s): MATH 1710/1720, and MEET 3990 or consent of department.

English

English, ENGL

The prerequisites to sophomore-level English are 3 semester hours of freshman-level English or equivalent credit. A student may enroll for sophomore-level English concurrently with the second term/semester of freshman-level English.

ENGL 2210 or ENGL 2220 will satisfy the university's humanities requirement. Students may take any literature course at the 2000, 3000, or 4000 level to satisfy the literature requirement of the College of Arts and Sciences Core. The same course may not be used to satisfy both requirements. ENGL 2700 may be substituted for ENGL 1320 in some majors. Students should consult advisers in their majors.

1200. Developmental Writing. 3 hours. Covers sentence formation and skills needed for argumentation and exposition within introduction, body and conclusion. Emphasizes audience, purpose and occasion. Does not apply to degree. Pass/no pass only.

1310-1320. Freshman English.

1310 (ENGL 1301). College Writing I. 3 hours. Writing as a means of ordering and shaping experience, information and ideas. Emphasis on perfecting texts through several drafts.

1320 (ENGL 1302). College Writing II. 3 hours. Continuation of ENGL 1310. Writing in response to reading and research. Emphasis on perfecting texts through several drafts. Prerequisite(s): ENGL 1310 or equivalent.

1311-1321. Honors Composition I and II.

1311. Honors Composition I. 3 hours. A process-oriented writing intensive course that provides students with the opportunity to write in response to their own experience, outside readings, and special topics selected by the instructor. Prerequisite(s): acceptance to University Honors Program. May be substituted for ENGL 1310.

1321. Honors Composition II. 3 hours. Continuation of ENGL 1311. A process-oriented writing intensive course that provides students with the opportunity to write in response to their own experience, outside readings, and special topics selected by the instructor. Prerequisite(s): acceptance to University Honors Program. May be substituted for ENGL 1320.

1312-1322. English Composition for International Students.

1312. Grammar and Composition for International Students. 3 hours. A linguistic synopsis of the essentials of English grammar in conjunction with the study and production of effective written and oral composition. May be substituted for ENGL 1310 by international students only.

1322. Composition and Rhetoric for International Students. 3 hours. Continuation of ENGL 1312. Course focuses on both the analysis and the production of expository writing as well as increased facility with the English language. Prerequisite(s): ENGL 1312 or equivalent. May be substituted for ENGL 1320 by international students only.

1313. Computer Assisted College Writing I. 3 hours. Writing as a means of critical thinking, with emphasis on the process of perfecting the essay through the writing of several drafts in the English computer classroom. No computer experience required. May be substituted for ENGL 1310.

1315-1325. Computer Assisted Writing About Literature I and II.

1315. Computer Assisted Writing About Literature I. 3 hours. Writing as a means of critical thinking using readings from poetry and drama as sources for essay topics. Emphasis on the process of perfecting the essay through the writing of several drafts in the English computer classroom. May be substituted for ENGL 1310.

1325. Computer Assisted Writing About Literature II. 3 hours. Study of relationship between writing and research with research topics drawn from readings from prose fiction. Emphasis on the process of perfecting the essay through the writing of several drafts in the English computer classroom. Prerequisite(s): ENGL 1315 or equivalent. May be substituted for ENGL 1320.

1323. Computer Assisted College Writing II. 3 hours. Continuation of ENGL 1313. Study of the relationship between writing and research. Emphasis on the process of perfecting the essay through the writing of several drafts in the freshman computer laboratory. Prerequisite(s): ENGL 1313 or equivalent. May be substituted for ENGL 1320.

2210-2220. World Literature.

2210 (ENGL 2332). Masterpieces of world literature from the Ancients Through the Early Renaissance. 3 hours. Prerequisite(s): three semester hours of freshman-level English or equivalent credit. *Satisfies the Humanities requirement of the University Core Curriculum.*

2220 (ENGL 2333). Masterpieces of world literature since the Renaissance. 3 hours. Prerequisite(s): three semester hours of freshman-level English or equivalent credit. *Satisfies the Humanities requirement of the University Core Curriculum.*

2211-2221. Honors World Literature.

2211. Masterpieces of world literature from the Ancients Through the Early Renaissance. 3 hours. Prerequisite(s): acceptance to University Honors Program. *Satisfies the Humanities requirement of the University Core Curriculum.*

2221. Survey of world literature since the Renaissance. 3 hours. Prerequisite(s): acceptance to University Honors Program. *Satisfies the Humanities requirement of the University Core Curriculum.*