

Engineering

- ENGT 107 Computer-Aided Drafting 3 credits**
Using a microcomputer-based CAD system, students learn basic drawing tools, modifications, layers, dimensioning, text, blocks, and hatch parameters. Students create drawings and learn how to plot, file, retrieve, and modify them. Projects include drawings from architectural, civil, mechanical, and electronic career fields. The course includes a review of basic drawing concepts, including orthographic, isometric, and line weights. Two lecture and two laboratory hours per week.
- ENGT 114 Digital Circuits 4 credits**
This course covers digital circuit design techniques including number theory, Boolean algebra, combinational and sequential logic circuits, state machines, counters, memory, and microprocessor basics. Labs cover hand wired logic-circuit implementation along with schematic and VHDL design using field programmable gate arrays.
Prerequisite: MATH 203 College Algebra or waiver by placement testing results, and COSC 170 C++ for Engineers or permission of instructor. Three lecture, and two laboratory hours per week.
- ENGT 140 Introduction to Engineering 4 credits**
This course introduces the student to the engineering profession and provides an opportunity for students to understand the content within the chemical, civil, computer, electrical, environmental, and mechanical engineering. This course prepares students for success in an engineering program and working environment through technical problem solving and design analysis, understanding engineering ethics and responsible decision making, teamwork, and communication. Significant emphasis is placed on engineering problem-solving techniques using MATLAB for mathematical analysis and graphical presentation. Three lecture and two laboratory hours per week.
Pre/Co-requisite: MATH 217 Precalculus; waiver by placement testing results; or permission of instructor.
- ENGT 204 Microprocessors and Digital Systems 4 credits**
This course focuses on embedded systems design and development. Topics include architecture, assembly language programming, timers, interrupt handling, and communication with analog and digital components. C programming is introduced for higher level programming. Hands on design projects are programmed and de-bugged on development boards. PREREQUISITE: ENGT 114 Digital Circuits. Three lecture and two laboratory hours per week.
- ENGT 270 Engineering Circuit Theory I 4 credits**
This is the first electrical engineering course covering basic electrical theory and circuit analysis. The goals of this course include developing the ability to solve engineering problems and to design, implement, and test circuits to meet design specifications. Topics include network theorems, nodal and mesh circuit analysis, dependent sources, Thevenin's and Norton's equivalent circuits, and solution of first- and second-order networks to switched DC inputs. The course also covers AC circuit steady-state response analysis, review of complex numbers, phasors, coupled inductors and ideal transformers, RMS voltage and current, the maximum power transfer theorem, balanced three-phase systems, and power and energy computations. Individual assignments are completed using circuit analysis techniques and MATLAB. Lab activities include the construction of circuits and using the necessary lab equipment to measure their performance and Multisim. Written report of project results is required. Three lecture and two laboratory hours per week.
Pre/Co-requisite: MATH 221 Calculus I; or waiver by placement testing results.
- ENGT 271 Engineering Circuit Theory II 4 credits**
This is the second engineering course in basic circuit theory and design. Analysis techniques in this course include application of Laplace transforms and differential equations with initial conditions to provide solutions to switched and steady state multi-ordered circuits. This course covers frequency analysis and the study of passive and active filter circuits. Circuit stability, the understanding of poles/zeros, and the use of Fourier transforms are also covered to introduce the student to circuit frequency response and Bode plot analysis and specification. Students are also introduced to graphical convolution and Fourier series as it applies to circuit analysis. Assignments and lab project activities require the design, implementation, and measurement of filters and other circuits to meet design specifications. Class instruction includes using Metlab and Multisim, in addition to hands-on circuit design and analysis. Three lecture and two laboratory hours per week.
Prerequisites: ENGT 270 Engineering Circuit Theory I and MATH 222 Calculus II; or waiver by placement testing results.
- ENGT 272 Engineering Materials 4 credits**
This course covers the basic principles that govern the properties and behavior of engineering materials: atomic structures, interatomic forces, amorphous and crystalline structures, and phase transformations. The course also covers the study of the capabilities and limitations of different materials such as metals, polymers, ceramics, and corrosion. Three lecture and two laboratory hours per week.
Prerequisites: MATH 221 Calculus I and PHYS 161 General Physics I; or waiver by placement testing results.
- ENGT 273 Statics 3 credits**
This course is a study of loads (force, torque) on physical systems in static equilibrium. It covers the analysis of force and moment vectors and their resultants, using free-body diagrams. Applications analyzed in this course include simple trusses, frames, and

machines; distribution of loads; and internal forces in beams. Properties of areas, second moments, and the laws of friction are also covered. MATLAB is used to support computational analysis. Two lecture and two laboratory hours per week.
Prerequisites: MATH 222 Calculus II and PHYS 161 General Physics I; or waiver by placement testing results.

ENGT 274 Dynamics 3 credits

This course covers the basic principles that govern forces and torques and their effects on the motion of particles and rigid bodies. This course also covers force, energy, and momentum analysis methods, as well as the study of unidirectional vibrations. MATLAB is used for computational analysis. Two lecture and two laboratory hours per week.
Prerequisites: ENGT 273 Statics and MATH 222 Calculus II; or waiver by placement testing results.

ENGT 275	Strength of Materials	4 credits
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This course provides engineering students with an understanding of various responses exhibited by solid engineering materials when subjected to mechanical and thermal loadings. It provides an introduction to the physical mechanisms associated with the design-limiting behavior of engineering materials, especially stiffness, strength, toughness, and durability. It also explores the basic mechanical properties of engineering materials, testing procedures used to quantify these properties, and ways in which these properties characterize material response. The student acquires quantitative skills to deal with materials-limiting problems in engineering design and a basis for materials selection in mechanical design. Three lecture and two laboratory hours per week.

Prerequisite: ENGT 273 Statics.

ENGT 276 Engineering Thermodynamics 3 credits

This course introduces fundamental thermodynamic concepts relevant to various engineering applications. Concepts such as work, temperature, and heat are introduced, and students are taught the zeroth, first, and second laws of thermodynamics and their application. An introduction to thermodynamic properties of idealized and real fluids is also provided. Students also learn theories related to the thermodynamic cycles, such as refrigeration, gas power, and steam, which govern the operation of various practical devices such as internal combustion engines, jet engines, power generators, refrigerators, and air conditioners. MATLAB is used for computational analysis. Two lecture and two laboratory hours per week.

Prerequisite: ENGT 273 Statics; or departmental approval.

ENGT 277 Introduction to Mechanical Engineering Graphics and Design with SOLIDWORKS 3 credits

This course introduces students to SOLIDWORKS for 3D design and parametric modeling of mechanical engineering designs. Students in this course learn problem identification, how to work with product specifications, designing for manufacturing, and product ergonomics considerations. In addition, this course provides students with the necessary tools to produce complete engineering drawing packages and produce 3D samples of their products. Two lecture and two laboratory hours per week. Pre/Co-requisite: MATH 217 Precalculus; waiver by placement testing results; or permission of instructor.