EGR - ENGINEERING

EGR 100 Engineering Graphics
The fundamentals of drafting, space geometry of points, lines and surfaces, graphs, graphical mathematics and design projects.
Upon successful completion of this course, students should be able to:
Reduce concepts and configurations to freehand sketches.
Construct orthographic drawings using drafting standards, conventions and instruments.
Construct pictorial and axonometric instrument drawings.
Solve descriptive geometry problems.
Apply the principles of graphic mathematics to scales, graphs, nomographs, empirical equations and graphical calculus.
Create and plot computer-aided drawings.
Solve individual and group preliminary design projects.
Prerequisites: MAT 151. Appropriate placement test scores may be accepted.
3 Credits2 Weekly Lecture Hours
2 Weekly Lab Hours

EGR 150 Engineering Topics
This course is a required series of eight seminars designed to introduce first year engineering students to skills and topics of importance in engineering and is taken in the second semester of the engineering curriculum. Presented by both DCCC faculty/staff and invited speakers, the weekly one-hour seminars cover technical writing and communication, research design, error analysis and internet research, along with presentations by practicing mechanical, chemical, electrical and computer engineers.
Upon successful completion of this course, students should be able to:
Use the Internet as a research tool in engineering.
Write a concise and accurate technical abstract on an engineering topic in an appropriate style.
Propose a research design for a specific engineering problem.
Explain how error analysis may be applied to a specific engineering problem.
Discuss the role of engineers in the current and future economic and technological environment.
Describe the technical areas in which practicing engineers work.
Clarify general or specific career goals in engineering.
Prerequisite: Successful Placement Test Scores or (ENG 050 and REA 050) or ENG 099* or REA 075 (*may be taken concurrently).
1 Credit1 Weekly Lecture Hour

EGR 200 Engineering Statics
A vector mechanics study of forces acting on static particles and rigid bodies. Equilibrium of rigid bodies, distributed body forces acting on centroid, centers of gravity and moments of inertia, analysis of structures, forces in beams and cables, friction and virtual work are topics covered.
Upon successful completion of this course, students should be able to:
Resolve forces acting in plane and space configurations.
Develop equivalent-force systems by means of vector, dot, cross, and triple products.
Solve equilibrium problems on two- and three-dimensional bodies.
Determine the effect of distributed forces on bodies in terms of center of gravity and moment of inertia.
Analyze the internal forces on structures such as trusses, frames, machines, beams, and cables.
Investigate the friction between moving components on mechanisms such as wedges, screws, bearings, wheels, and belts.
Use the method of virtual work to solve for forces, mechanical efficiency, potential energy, equilibrium, and stability.
Prerequisite: MAT 161 and PHY 131.
3 Credits3 Weekly Lecture Hours

EGR 201 Engineering Dynamics
A course in vector dynamics. Topics include the kinematics and kinetics of particles and rigid bodies in plane and three-dimensional motion. Force, energy, and momentum methods, as well as the study of unidirectional vibrations are covered.
Upon successful completion of this course, students should be able to:
Analyze the kinematics of particles and rigid bodies for unidirectional, bidirectional, and general motion.
Develop the kinetics of particles and rigid bodies in terms of force, energy, and momentum for unidirectional, bidirectional, and general motion.
Determine the motion of single particles and rigid bodies in one-dimensional vibrating or oscillating systems.
Prerequisites: EGR 200 and MAT 261*. *May be taken concurrently.
3 Credits3 Weekly Lecture Hours

EGR 210 Engineering Circuits
A first course in circuits for engineers. Uses the basic concepts of modern circuit analysis. Topics include two-terminal devices and their classification, circuit topology and Kirchoff's Laws, lumped-circuit analysis using matrix algebra, controlled and independent sources, power and energy, and second-order time-domain techniques (including singularity functions, convolution and introductory state-variable techniques). Theory will be illustrated by laboratory and class assignments.
Upon successful completion of this course, students should be able to:
Set up and solve circuit problems using mesh analysis.
Set up and solve circuit problems using nodal analysis.
Set up and solve for the transient response of first-order and second-order circuits.
Set up and solve for the general solution of first-order and second-order circuits.
Find the initial conditions of first-order and second-order circuits.
Use instruments (DMM, power supplies, function generators, oscilloscopes) to measure various electrical quantities.
Find the impulse response of electrical circuits.
Find the response to a given input of an electrical circuit using convolution.
Prerequisites: PHY 132 and MAT 261*. *May be taken concurrently.
4 Credits3 Weekly Lecture Hours
2 Weekly Lab Hours

EGR 220 Engineering Thermodynamics
Engineering Thermodynamics is an introductory one-semester course with lecture and demonstrations designed for engineering and science students. Major topics include: concepts of thermodynamics; pressure; temperature; heat and heat transfer; properties of substances; density; extensive and intensive properties; First Law of Thermodynamics and its application; Second Law of Thermodynamics and its application; reversible and irreversible processes; the Clausius, Kelvin, and Planck statements of the Second Law; entropy and Carnot, Otto, Diesel, and Rankine cycles; power cycles and the refrigeration cycle.
Upon successful completion of this course, students should be able to:
Understand the basic concepts and definitions needed to apply the laws of thermodynamics.
Describe the properties and behavior of a pure substance.
Develop the First Law of Thermodynamics and apply it to control volume problems.
State the Second Law of Thermodynamics and describe its significance to the analysis of cycles and processes.
Understand the concept of entropy and its relationship to the Second Law of Thermodynamics.
Analyze the operation of power and refrigeration systems.
Prerequisite: CHE 110 and MAT 161 and PHY 132*. *May be taken concurrently.
3 Credits3 Weekly Lecture Hours