

Course Description – Pre-Engineering

Program Course Requirements - Computer Science

CSC 100 Introduction to Computer Science (3) This course provides students with a general orientation to computer science, including a basic understanding of the components of a computer and how they function. It will introduce the student to the process of program development and provide the student with an overview of computer operations to include the operating system, basic networking, and telecommunications. Other topics covered include number systems, file management, data organization, and an introduction to the C++ programming language.

CSC 144, Computer Science I F, S, Su (4) Introduction to problem solving using the C++ programming language. Topics include algorithm and program development, syntax of C++, input/output statements, assignment operations, program control structures, functions, and single dimensional array processing. Additional topics may be added if time permits. Emphasis is placed on structured program design techniques and program modularity. Prerequisite: Credit or concurrent enrollment in CSC 100.

CSC 184, Computer Science II F, S (4) This course is a continuation of CSC 144. Topics include multidimensional array processing, character data manipulation, elementary searching and sorting techniques, structures, classes to include overloading, pointers and data abstraction. Prerequisite: CSC 144 with a grade of C or better.

Program Course Requirements - Mathematics

MTH 151 College Algebra (3) A first course in college algebra including the following topics: polynomial equations and inequalities, mathematical modeling and problem solving, rational functions, other functions and relations. Students who enjoy math, students who need MTH 151 for their major, students who are going on and taking higher level math courses, and/or students who are majoring in math but need to strengthen their algebra skills are the only students for whom this course is recommended. Prerequisite: Two years of high school algebra. Offered every semester.

MTH 152 Precalculus: Elementary Functions (3) A preparation for calculus covering polynomial and rational functions, exponential and logarithmic functions, trigonometric functions, applications and systems of linear equations. A graphing calculator is required. Prerequisite: Two years of high school algebra or MTH 151. Offered every semester.

MTH 271, Calculus I (5) A first study of real functions and some of their applications. Topics include limits, continuity, differentiation and integration. A graphing calculator is required. Prerequisite: High school algebra and trigonometry OR C or better in MTH 152 and permission of department. Offered fall and spring semester.

MTH 272 Calculus II (5) A continuation of the study of real functions of one variable. Topics include integration, applications of integrations, methods of integration, infinite series, and vectors. A graphing calculator is required. Prerequisite: C or better in MTH 271 . Offered fall and spring semester.

MTH 303 Calculus III (5) The study of real functions of more than one variable. Topics include partial derivatives, gradient, potential functions, line integral, multiple integration, and Taylor's formula. A graphing calculator is required. Prerequisite: C or better in MTH 272

Program Course Requirements - Physics

PHY 301 General Physics I (4) A calculus-based treatment of mechanics for scientists and engineers, including kinematics, vectors, Newton's laws, and conservation laws for energy, linear momentum, and angular momentum. Other topics include equilibrium and elasticity, gravitation, fluids, simple harmonic oscillations, waves and

thermodynamics. Lab work is included. This course is available for honors credit. Prerequisite: MTH 271. Lab fee required.

PHY 302, General Physics II (4) A calculus-based treatment of electromagnetism for scientists and engineers, including electric fields, Gauss's law, scalar potential fields, Maxwell's equations, electromagnetic oscillations, electromagnetic waves, and optics. Lab work is included. This course is available for honors credit. Prerequisite: PHY 301. Lab fee required.

Program Course Requirements - Chemistry

CHM 251, General Chemistry I (3) A systematic treatment of the principles of chemistry. Topics include atomic structure, chemical bonding, classification of the elements, physical properties of gases, and solution chemistry. CHM 261 must be taken concurrently with this course. Prerequisite: 2 years of high school algebra or MTH 151.

CHM 252, General Chemistry II (3) A continuation of CHM 251. Topics include stoichiometry, solutions, thermodynamics, kinetics, equilibria, and classification of the elements. CHM 262 must be taken concurrently with this course. Prerequisite: Grade of C or better in CHM 251 or permission of instructor.

CHM 261, General Chemistry I Laboratory (2) Course consist of one 2-hour laboratory period and one discussion meeting per week. Laboratory includes hands-on experimental procedures of general chemistry phenomena. Discussion focuses on mastery of chemistry concepts through class participation and group work. Must be taken concurrently with CHM 251. Lab Fee.

CHM 262, General Chemistry II Laboratory (2) Course consist of one 2-hour laboratory period and one discussion meeting per week. Laboratory includes hands-on experimental procedures of general chemistry phenomena. Discussion focuses on mastery of chemistry concepts through class participation and group work. Must be taken concurrently with CHM 252. Lab Fee.

Program Course Requirements - Engineering

EGR 261 Engineering Mechanics I-Statics (3) This course includes statics of particles and rigid bodies, equivalent systems of forces, distributed forces, centroids, application to trusses, frames, machine beams and cables, friction, moments of inertia and principles of virtual work and applications. Prerequisites: MTH 272, PHY 301, and permission of department.

EGR 262 Engineering Mechanics II-Dynamics (3) This course reviews vector algebra and calculus. It introduces kinematics of a particle, Newton's laws and kinetics of a particle, work and energy, impulse and momentum, kinematics of rigid bodies, general theorems for systems of particles, kinetics of rigid bodies and the inertia tensor. Prerequisite: EGR 261, PHY 302, MTH 311, and permission of department. Offered spring semester .

EGR 331, Engineering Mechanics I - Statics (3) This course includes statics of particles and rigid bodies, equivalent systems of forces, distributed forces and centroids. Applications considered include: trusses, frames, beams, and cables. The course also treats friction, moments of inertia and principles of virtual work. Prerequisite: MTH 271 and PHY 301. Offered Fall Semesters of Odd Numbered years.

EGR 332, Engineering Mechanics II - Dynamics (3) This course begins with a review of vector algebra, vector calculus, kinematics of a particle, work and energy, and impulse and momentum. This is followed by a treatment of kinematics of rigid bodies, general theorems for systems of particles, kinetics of rigid bodies and inertia tensor. Prerequisites: EGR 331 and MTH 303 or concurrent enrollment. Offered Spring Semesters of Even Numbered years.