EGEN - General Engineering

EGEN 102. Intro to Engineer Comp Apps. 2 Credits. (2 Lec) S
COREQUISITE: M 171Q. Effective methods for applying the computer to common numerical problems encountered in chemical engineering. Chemical engineering examples will provide a basis for more comprehensive problems encountered in the other professional level courses.

EGEN 105. Intro to General Engineering. 2 Credits. (1 Lec, 1 Lab) F,S
Provides students an opportunity to explore the fields of engineering, engineering technology, and computer science. Other topics include engineering design, career opportunities, professionalism, and ethics.

EGEN 115. Engineering Graphics. 1 Credit. (1 Lec) F,S
Lec 1 Introductory course developing freehand sketching for engineering design graphics. Skills will be developed for sketching and interpreting dimensioned multi-view drawings, pictorials, sections, and assemblies.

EGEN 125CS. Tech, Innovation, and Society. 3 Credits. (3 Lec) F,S
This course explores the innovative engineering processes that connect the creative elements of science and engineering with solving problems of everyday life. Topics include understanding the role of creativity, public safety and ethics in creating technological solutions. Case studies are investigated, including applying critical thinking to exploring how innovation can help society.

EGEN 200. Designing Our Community. 1 Credit. (1 Sem) F,S
This course is designed to explore issues in engineering and college academics for American Indian students in the Designing Our Community Program. The course will provide a learning community among students to ensure success in achieving their professional goals. Spring semester focuses on service learning projects.

EGEN 201. Engineering Mechanics--Statics. 3 Credits. (3 Lec) F,S
Su PREREQUISITE: PHSX 220 or PHSX 240. COREQUISITE: M 273Q or M 283Q. Equilibrium of particles and rigid bodies; static analysis of structures including trusses, beams, frames and machines; coulomb friction; area and mass centroids, moments and products of inertia.

EGEN 202. Engineering Mechanics Dynamics. 3 Credits. (3 Lec) F,S
Su on demand PREREQUISITE: EGEN 201 or EGEN 221 and M 273Q or M 283Q. Kinematics, kinetics, work-energy, and impulse-momentum for particles and rigid bodies.

EGEN 203. Applied Mechanics. 3 Credits. (3 Lec) F
PREREQUISITE: PHSX 205 or PHSX 220 or PHSX 240. COREQUISITE: M 166Q or M 172Q. Force systems in equilibrium and applications to structural trusses and frames; section properties; distributed force systems; shear and moment distributions in beams; basic particle dynamics.

EGEN 205. Mechanics of Mtls (equiv 305). 3 Credits. (3 Lec) F,S,Su On Demand PREREQUISITE: EGEN 201 or EGEN 221. Stress and strain, Hook's Law, thermal strain, torsion, bending of beams, combined stress, limit analysis, energy methods, virtual work, column theory.

EGEN 208. Applied Strength of Materials. 3 Credits. (3 Lec) F,S,Lec 3 PREREQUISITE: EGEN 201 or EGEN 203 or EGEN 221. Equilibrium and deformation of structural elements; concepts of stress and strain and interrelationship; representation and transformation of combined stress states; axial, torsional and flexural stresses and deformation; column buckling.

EGEN 221. Honor Statics. 3 Credits. (2 Lec, 1 Lab) On Demand PREREQUISITE: PHSX 200 or PHSX 240 and good standing in University Honors. COREQUISITE: M 273Q or M 283Q. Honors offering of engineering statics, including topics dealing with equilibrium of particles and rigid bodies; static analysis of structures including trusses, beams, frames and machines; coulomb friction; area and mass centroids, moments and products of inertia.

EGEN 290R. Undergraduate Research. 1-6 Credits. (1-6 Ind; max unlimited) F,S
Directed undergraduate research which may culminate in a written work or other creative project. Course will address responsible conduct of research. May be repeated.

EGEN 291. Special Topics. 1-4 Credits. (1-4 Lec; 12 cr max) On Demand PREREQUISITE: None required but some may be determined necessary by each offering department. Courses not required in any curriculum for which there is a particular one-time need, or given on a trial basis to determine acceptability and demand before requesting a regular course number.

EGEN 292. Independent Study. 1-3 Credits. (1 Ind; 6 cr max) On Demand PREREQUISITE: Consent of instructor and approval of department head. Directed research and study on an individual basis.

EGEN 310R. Multidisciplinary Engineering Design. 3 Credits. (3 Lec) F,S
PREREQUISITE: Junior standing in an Engineering curriculum or consent of instructor. Introduces engineering students to topics such as design process, creative design, project management, teamwork, and technical leadership while highlighting the skills needed to work in a multi-disciplinary environment.

EGEN 324. Applied Thermodynamics. 3 Credits. (3 Lec) F,S
PREREQUISITE: PHSX 205 or PHSX 220. COREQUISITE: M 166Q or M 172Q. General treatment of the basic laws of thermodynamics and engineering applications with introduction to heat transfer for curricula not requiring EMEC 320/EMEC 321 series.

EGEN 325. Engineering Economic Analysis. 3 Credits. (3 Lec) F,S,Su
PREREQUISITE: Junior standing, M 171Q or M 165Q, or instructor approval. Methods for comparing and evaluating capital investment alternatives. Concepts include the time value of money, rates of return, cash flows, incremental analysis, depreciation, influences of taxes, inflation and deflation, depreciation, replacement analysis. Emphasis is placed upon evaluating various engineering alternatives. Some open-ended design problems are included.

EGEN 331. Applied Mechanics of Fluids. 3 Credits. (3 Lec) F,S
Lec 3 PREREQUISITE: EGEN 208 or EGEN 205. Basic principles of fluid mechanics: pressure measurement, forces on submerged areas, fluid flow through conduits, parallel pipe systems, open channel flow, forces caused by fluids in motion, pumps, flow of air in ducts.

EGEN 335. Fluid Mechanics. 3 Credits. (3 Lec) F,S
Su on demand PREREQUISITE: EGEN 202, EGEN 205. Introduction to modern fluid mechanics.

EGEN 350. Applied Engr Data Analysis. 2 Credits. (2 Lec) F,S,Su
PREREQUISITE: M 166Q or M 172Q. An overview of data variability and applied statistical analysis techniques for a broad range of engineering disciplines. Topics include fundamentals of probability, essential probability distributions, hypothesis testing, experimental design strategies, and regression in the context of engineering applications.

EGEN 415. Advanced Mechanics of Solids. 3 Credits. (3 Lec) F
Lec 3 PREREQUISITE: EGEN 205. Advanced topics in deformational mechanics of materials; application to contemporary engineering problems. Computer applications.

EGEN 435. Fluid Dynamics. 3 Credits. (3 Lec) F,S
Su on demand PREREQUISITE: EGEN 335. Equations governing steady and unsteady fluid flow; applications to contemporary engineering problems. Computer applications.

EGEN 488. Fundamentals of Engineer Exam. 0 Credits. (0 Ind) F,S
PREREQUISITE: Must be in final two semesters of program. Student participation in engineering program assessment. Requirement to complete the Fundamentals of Engineering (FE) examination or the Major Field Test in Computer Science (CS majors only). Applications for the exams must be obtained from the students' departments. Application deadlines: fall semester - May 15th; spring semester - December 15th.

EGEN 490R. Undergraduate Research. 1-4 Credits. (1 Ind; 12 cr max) F,S,Su
Directed undergraduate research/creative activity which may culminate in a research paper, journal article, or undergraduate thesis. May be repeated.

EGEN 491. Special Topics. 1-4 Credits. (1-4 Lec; 12 cr max) On Demand PREREQUISITE: Course prerequisites as determined for each offering. Courses not required in any curriculum for which there is a particular one-time need, or given on a trial basis to determine acceptability and demand before requesting a regular course number.

EGEN 492. Independent Study. 1-3 Credits. (1 Ind; 4 cr max) On Demand PREREQUISITE: Junior standing, consent of instructor, and approval of Department Head. Directed research and study on an individual basis.

EGEN 498. Internship. 1-3 Credits. (1 Ind; 12 cr max) On Demand IND PREREQUISITE: Junior standing, consent of instructor and approval of Department Head. An individualized assignment arranged with an agency, business, or other organization to provide guided experience in the field. Students may not take this course the semester they graduate.

EGEN 498R. Internship. 1-3 Credits. (1 Ind; 12 cr max) On Demand IND PREREQUISITE: Junior standing, consent of instructor and approval of Department Head. An individualized assignment arranged with an agency, business, or other organization to provide guided experience in the field. Students may not take this course the semester they graduate.

EGEN 505. Advanced Engineering Analysis. 3 Credits. (3 Lec) F
PREREQUISITE: One of the following: EMEC 425, EMEC 326, EGEN 335. Mathematical modeling of engineering systems, physical interpretation of ordinary and partial differential equations and methods of solution.
EGEN 506. Numerical Sol to Engr Problems. 3 Credits. (3 Lec) S
PREREQUISITE: EGEN 505 or instructor approval. Numerical methods used to solve common engineering research problems. Solutions to nonlinear equations. Optimization methods.

EGEN 541. Thry Magnetic Resonance Imag I. 3 Credits. (3 Lec) F,S
PREREQUISITE: Graduate standing, or consent of instructor. Advanced topics in NMR phenomena including relaxation, diffusion, chemical shift, and magnetic susceptibility, as well as experimental aspects including phase cycling, magnetic field gradients, rf coil, tuning and matching and pulse sequence development will be covered.

EGEN 542. Thry Magnetic Resonance Imag II. 3 Credits. (3 Lec) F,S
PREREQUISITE: Graduate standing. Consent of Instructor. Advanced topics in nuclear magnetic resonance phenomena focusing on molecular dynamics and pulse sequence development for measuring complex dynamics will be covered.