EGEN 102. Intro to Engineer Comp Apps. 3 Credits. (3 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. Introduction to General Engineering. 2 Credits. (1 Lec, 1 Lab) ES
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) On Demand
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) FSu
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) ES
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) FSu On Demand.
PREREQUISITE: PHSX 220 or PHSX 240. COREQUISITE: M 273Q or M 283Q.
Equilibrium of particles and rigid bodies; static analysis of structures including trusses,
bearings, frames and machines; coulomb friction; area and mass centroids, moments
and products of inertia.

EGEN 250. Mechanics of Materials. 3 Credits. (3 Lec) 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.
Common Exams.

EGEN 203. Applied Mechanics. 3 Credits. (3 Lec) FSu On Demand.
PREREQUISITE: PHSX 205 or PHSX 220 or PHSX 240. COREQUISITE: M 166Q,
M 172Q or M 182Q. 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. Engineering Mechanics- Dynamics. 3 Credits. (3 Lec) FSu 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.
Common Exams.

EGEN 208. Applied Strength of Materials. 3 Credits. (3 Lec) Su On Demand
PREREQUISITE: EGEN 201 or EGEN 221 and M 273Q or M 283Q. Stress and
strain, Hook’s Law, thermal strain, torsion, bending of beams, combined stress,
limit analysis, energy methods, virtual work, column theory.

EGEN 209. Fluid Mechanics. 3 Credits. (3 Lec) Su On Demand
PREREQUISITE: EGEN 201 or EGEN 221 and M 273Q or M 283Q. Fluid Mechanics
including topics dealing with equilibrium of particles and rigid bodies; static analysis
of structures including trusses, bearings, 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) ES
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
course 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. (1-3 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) FS
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) ES
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 MEC E 320/EMEC 321
series. Evening exams required.

EGEN 325. Engineering Economic Analysis. 3 Credits. (3 Lec) S
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 330. Business Fundamentals for Technical Professionals. 3 Credits. (3 Lec)
FS, Su
PREREQUISITE: Consent of instructor and approval of department head. This course
focuses on providing students an understanding of business concepts, systems,
principles, and practices that are common to engineering disciplines. Topics
include financial management, budgeting, accounting, and financial decision
making, including topics dealing with cash flows, capital budgeting, and
financial analysis.

EGEN 335. Fluid Mechanics. 3 Credits. (3 Lec) ES, Su
PREREQUISITE: EGEN 202, EGEN 205. Introduction to fluid mechanics. Further
development of fluid mechanics described in M 172Q.

EGEN 340. Special Problems. 3 Credits. (3 Lec) FS, Su
PREREQUISITE: Junior standing, M 172Q or M 182Q. An in-depth study of
selected topics in general engineering, with an expenditure of a part of the
normal class period.Includes a significant lab component culminates in an
open-ended team design project.

EGEN 341. Advanced Mechanics of Solids. 3 Credits. (3 Lec) F
PREREQUISITE: EGEN 205. Advanced topics in deformational mechanics of
materials; application to contemporary engineering problems. Computer applications.

EGEN 410. Ice and Snow Mechanics. 3 Credits. (3 Lec) S
PREREQUISITE: EGEN 335. From an engineering perspective, ice and snow are very
complex materials. This course will assist students in understanding and predicting
the physical and thermo-mechanical processes of ice and snow, their roles in the
environment, and their implications for engineering. A solid grasp of calculus, physics
and engineering mechanics will be required to be able to study these processes.

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

EGEN 488. Fundamentals of Engineering Exam. 9 Credits. (0 Ind) FS
PREREQUISITE: Must be in final semester 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). Students register for the FE exam through the NCEES website (https://
ncees.org) and then schedule a time to take the exam online. Documentation must be
submitted to the Engineering Dean’s Office prior to Finals Week.

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

EGEN - General Engineering
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. (1-3 Ind; 4 cr max)
PREREQUISITE: Junior standing, consent of instructor, and approval of Department Head. Directed research and study on an individual basis.

EGEN 494. Engineering Peer Academic Leader Foundations. 1 Credit. (1 Lec) ES
PREREQUISITE: Acceptance into the College of Engineering Peer Academic Leaders program. Students will learn skills to enhance their ability to interact with individuals from underrepresented or disadvantaged groups within the student population. Leadership potential will be developed through identification of implicit bias, gender schemas, and microaggressions and emphasize the student's role in becoming an effective agent of change.

EGEN 498. Internship. 1-3 Credits. (1-3 Ind; 12 cr max)
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 498Z. Internship. 1-3 Credits. (1-3 Ind; 12 cr max) On Demand
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
Numerical methods used to solve common engineering research problems. Solutions to nonlinear equations. Optimization methods.

EGEN 511. Engineering Methods for Teachers. 3 Credits. (2 Lec, 1 Rct) S
PREREQUISITE: A minimum of 2 years teaching experience. This course is designed to introduce the concepts of engineering technology design to equip teachers of science to meet and exceed emerging standards of teaching engineering process K-12. A balanced approach of engineering processes and educational pedagogy will be the cornerstones of the course.

EGEN 541. They Magnetic Resonance Imag I. 3 Credits. (3 Lec) ES
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. They Magnetic Resonance Imag II. 3 Credits. (3 Lec) ES
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.