ENGINEERING (ENGR)

ENGR 110 - Introduction to Engineering
The first in a two·semester course sequence aiming to provide students with an introduction to engineering, design process, and tools needed in the engineering professions. This course introduces students to the different disciplines of engineering, professional and ethical aspects of engineering, teamwork, engineering design process and problem solving, and various computer applications.

Credits: 2
Term(s) Typically Offered: Offered Fall Terms

ENGR 120 - Engineering Design Tools
This is the second in a two-semester course sequence aiming to provide students with an introduction to engineering, design process, and tools needed in the engineering professions. This course focuses on the design process, introduction to engineering computing tools, engineering graphics using a Computer Aided Design (CAD) software platform, and 3D printing. Students will learn the basic tools and techniques used in engineering design and problem solving.

Credits: 2
Term(s) Typically Offered: Offered Spring Terms

ENGR 130 - Engineering Computing Tools
This course provides students with computing skills required in engineering. Course content includes structured programming, engineering problems and open-ended design projects, which are solved in teams with results professionally presented.

Credits: 2
Term(s) Typically Offered: Offered Fall & Spring Terms

ENGR 139 - Foundations of Academic Discovery
Foundations of Academic Discovery serves as the entry point to the Rock Integrated Studies Program. With its strong faculty-student interaction, the course promotes intellectual inquiry, critical and creative thinking, and computer skills needed for academic success. Through varied content, the course introduces students to academic discourse and information literacy while exploring topics such as diversity and inclusion and global awareness. This course will set students along the path to becoming engaged with issues and scholarship important to a 21st century education while they learn about themselves and their place in the world.

Credits: 3
Term(s) Typically Offered: Offered as Needed
Enrollment limited to students with a semester level of Freshman 1 or Freshman 2.
Enrollment limited to students with the ROCK STUDIES 2 STUDENT or ROCK STUDIES STUDENT attributes.

ENGR 190 - Experimental
A unique and specifically focused course within the general purview of a department which intends to offer it on a "one time only" basis and not as a permanent part of the department's curriculum.

Credits: 1-3
Term(s) Typically Offered: Offered as Needed

ENGR 195 - Workshop
A workshop is a program which is usually of short duration, narrow in scope, often non-traditional in content and format, and on a timely topic.

Credits: 1-6
Term(s) Typically Offered: Offered as Needed

ENGR 198 - Selected Topics
A Selected Topics course is a normal, departmental offering which is directly related to the discipline, but because of its specialized nature, may not be able to be offered on a yearly basis by the department.

Credits: 1-3
Term(s) Typically Offered: Offered as Needed

ENGR 210 - Statics
Includes the application of equilibrium conditions to structures, trusses, frames and machines, and beams with concentrated and distributed loads.

Prerequisites: PHYS 216[D] and MATH 230 (may be taken concurrently)[D]
[D] Requires minimum grade of D.
Credits: 3
Term(s) Typically Offered: Offered Fall Terms

ENGR 220 - Engineering Materials
This course covers the properties and uses of typical materials used in various engineering professions, their manufacturing processes, and an introduction to mechanical testing methods.

Prerequisite: CHEM 107[D]
[D] Requires minimum grade of D.
Credits: 3
Term(s) Typically Offered: Offered Spring Terms

ENGR 230 - Mechanics of Materials
This course provides a review of the basic mechanical properties of the solids with lab. Topics covered will include deformation and failure of solid bodies under the action of forces, stress· strain, Mohr's circle, generalized Hooke's Law, axial bending and buckling.

Prerequisites: ENGR 210[D] or PHYS 314[D]
[D] Requires minimum grade of D.
Credits: 3
Term(s) Typically Offered: Offered Spring Terms

ENGR 231 - Mechanics of Materials Lab
A laboratory course to accompany ENGR 230 Mechanics of Materials. Laboratory experiments are designed to introduce experimental techniques common to structural engineering, interpretation of experimental data, comparison of measurements to numerical/analytical predictions, and formal, engineering report writing.

Prerequisite: ENGR 230 (may be taken concurrently)[D]
[D] Requires minimum grade of D.
Credits: 1
Term(s) Typically Offered: Offered Spring Terms

ENGR 240 - Dynamics
Integrates the subject content of kinematics and kinetics that deal respectively with the description of motion of bodies and the causes for their motion.

Prerequisites: PHYS 314[D] or ENGR 210[D]
[D] Requires minimum grade of D.
Credits: 3
Term(s) Typically Offered: Offered Spring Terms

ENGR 290 - Experimental
A unique and specifically focused course within the general purview of a department which intends to offer it on a "one time only" basis and not as a permanent part of the department's curriculum.

Credits: 1-3
Term(s) Typically Offered: Offered as Needed

ENGR 295 - Workshop
A workshop is a program which is usually of short duration, narrow in scope, often non-traditional in content and format, and on a timely topic.

Credits: 1-6
Term(s) Typically Offered: Offered as Needed

ENGR 298 - Selected Topics
A Selected Topics course is a normal, departmental offering which is directly related to the discipline, but because of its specialized nature, may not be able to be offered on a yearly basis by the department.

Credits: 1-3
Term(s) Typically Offered: Offered as Needed

ENGR 301 - Fluid Mechanics
This course provides an overview of fluid statics and dynamics concepts. Topics covered will include fluid statics, laminar and turbulent flow of compressible and incompressible fluids, flow measurements, open channel flow and kinetics of fluids.

Prerequisites: ENGR 210[D] and MATH 230[D]
[D] Requires minimum grade of D.
Credits: 3
Term(s) Typically Offered: Offered Fall Terms
Students with a semester level of Freshman 1, Freshman 2 or Sophomore 1 may **not** enroll.

ENGR 310 - Introduction to Electrical Engineering
This course provides a review of the basic concepts in electrical engineering. Topics covered will include electrical engineering units, circuit elements, circuit laws, measurement principles, mesh and node equations, network theorems, operational amplifier circuits, energy storage elements, sinusoids and phasors, sinusoidal steady state analysis, average and RMS values, complex power.

Prerequisites: PHYS 212[D] or PHYS 217[D]
[D] Requires minimum grade of D.
Credits: 3
Term(s) Typically Offered: Offered Spring Terms
Enrollment limited to students with a semester level of Freshman 1, Freshman 2 or Sophomore 1.

ENGR 320 - Thermodynamics
This course provides a detailed review of the basic thermodynamic principles. Topics covered will include properties of ideal gases and vapors; first and second laws of thermodynamics; basic gas and vapor cycles; basic refrigeration.

Prerequisite: PHYS 217[D]
[D] Requires minimum grade of D.
Credits: 3
Term(s) Typically Offered: Offered Fall Terms
Students with a semester level of Freshman 1, Freshman 2 or Sophomore 1 may **not** enroll.

ENGR 340 - Engineering Economics
This course covers the concepts of cash flow, cash flow equivalence, cash flow before taxes, depreciation and depletion, cash flows after taxes, profits, evaluation of alternatives, financial statements and multidisciplinary team project.

Prerequisite: MATH 225[D]
[D] Requires minimum grade of D.
Credits: 3
Term(s) Typically Offered: Offered Fall Terms
Students with a semester level of Freshman 1, Freshman 2 or Sophomore 1 may **not** enroll.

ENGR 390 - Experimental
A unique and specifically focused course within the general purview of a department which intends to offer it on a "one time only" basis and not as a permanent part of the department's curriculum.

Credits: 1-3
Term(s) Typically Offered: Offered as Needed
Enrollment limited to students with a semester level of Graduate.

ENGR 395 - Workshop
A workshop is a program which is usually of short duration, narrow in scope, often non-traditional in content and format, and on a timely topic.

Credits: 1-6
Term(s) Typically Offered: Offered as Needed
Students with a semester level of Freshman 1, Freshman 2 or Sophomore 1 may **not** enroll.

ENGR 398 - Selected Topics
A Selected Topics course is a normal, departmental offering which is directly related to the discipline, but because of its specialized nature, may not be able to be offered on a yearly basis by the department.

Credits: 1-3
Term(s) Typically Offered: Offered as Needed
Students with a semester level of Freshman 1, Freshman 2 or Sophomore 1 may **not** enroll.

ENGR 490 - Independent Study
Independent Study courses give students the opportunity to pursue research and/or studies that are not part of the university's traditional course offerings. Students work one on one or in small groups with faculty guidance and are typically required to submit a final paper or project as determined by the supervising professor.

Credits: 1-3
Term(s) Typically Offered: Offered as Needed
Students with a semester level of Freshman 1, Freshman 2 or Sophomore 1 may **not** enroll.

ENGR 495 - Workshop
A workshop is a program which is usually of short duration, narrow in scope, often non-traditional in content and format, and on a timely topic.

Credits: 1-6
Term(s) Typically Offered: Offered as Needed
Students with a semester level of Freshman 1, Freshman 2 or Sophomore 1 may **not** enroll.

ENGR 498 - Selected Topics
A Selected Topics course is a normal, departmental offering which is directly related to the discipline, but because of its specialized nature, may not be able to be offered on a yearly basis by the department.

Credits: 1-3
Term(s) Typically Offered: Offered as Needed
Students with a semester level of Freshman 1, Freshman 2 or Sophomore 1 may **not** enroll.