

Engineering (E)

E 101 Introduction to Engineering & Problem Solving (1 credit hours)

An introduction to the College of Engineering as a discipline and profession. Emphasis on engineering design, interdisciplinary teamwork, and problem solving from a general engineering perspective. Overview of academic policies affecting undergraduate engineering students. Exposure to College of Engineering and university-wide programs and services.

Prerequisite: Engineering Majors, Freshman standing

Typically offered in Fall, Spring, and Summer

E 102 Engineering in the 21st Century (2 credit hours)

This interdisciplinary course will provide an overview of the fourteen engineering grand challenges of the 21st century and their relationships to all of the separate engineering disciplines in the College of Engineering. The lectures will incorporate examples, guests, and specific readings on the challenges in sustainability, health, vulnerability, and the joy of living to advance civilization into the next century. Students will gain an appreciation for the methods in which engineers, in each discipline, acquire knowledge and design tools or interdisciplinary solutions essential to meet society's future needs. Course is available to 25% non-engineering students.

Restriction: Freshmen only with completion of a college introductory course, i.e. E101

GEP Interdisciplinary Perspectives

Typically offered in Fall only

E 115 Introduction to Computing Environments (1 credit hours)

Introduction to the NC State computing system, and to student-owned computing resources. Includes topics such as maintaining your own computer, learning about campus-based computing resources and applications (how to access and use them), ethics and professionalism in the use of computing resources, introduction to web development and other campus resources.

Typically offered in Fall, Spring, and Summer

E 122 Engineering Academic Success (1 credit hours)

This 8-week course is designed to teach students a variety of proven strategies for creating greater academic, professional, and personal success. Enrollment is required of students in the College of Engineering who were unsuccessful in completing E101 and/or have an earned GPA less than 2.0 after the first semester of the freshman year. Topics include: time management, goal setting, stress management, study skills, learning styles, and campus resources using a platform of lectures and guest speakers.

Typically offered in Spring only

E 144 Academic and Professional Preparation for Engineering I (1 credit hours)

Assist new freshmen engineering students in the transition from high school to the collegiate environment. Cover critical-thinking; problem solving techniques; academic skills and time management.

Typically offered in Fall only

E 145 Academic and Professional Preparation for Engineering II (1-3 credit hours)

This course is designed to promote professional and career development. As a part of the class you will deepen and refine your leadership abilities while furthering your knowledge of engineering as a field of study and profession. In addition, students will learn how to better prepare to pursue careers in engineering through activities that will aid with goal setting, performance development, the creation of effective communication strategies as well as identifying areas for future academic and professional consideration.

Typically offered in Spring and Summer

E 201 Engineering Transfer to Success (1 credit hours)

This 8-week course will provide an overview of the NC State University policies and procedures, organizations, and resources available for enhancing the academic success of new transfer students in the College of Engineering. Lectures and discussion from departmental representatives will focus on requirements and availability for financial aid, cooperative education, career services, and campus student organizations. Emphasis will be placed on acclimating student through teamwork and academic achievement within the first year of transfer.

Prerequisite: E101 or Introduction to College Course

Typically offered in Fall only

E 298 Special Topics in Engineering (1-4 credit hours)

Presentation of material not normally available in regular course offerings or offering of new courses on a trial basis. Credits and content determined by the faculty member in consultation with the Department Head. Students may receive credit multiple times for this course if a different topic is taught.

Typically offered in Fall and Spring

E 304 Introduction to Nano Science and Technology (3 credit hours)

Fundamental concepts of Nano-Science and Technology including scaling, nano-scale physics, materials, mechanics, electronics, heat transfer, photonics, fluidics and biology. Applications of nano-technology.

Prerequisite: MA 242 and PY 208 with grade of C- or higher

Typically offered in Fall and Spring

E 480 Namibia Wildlife Aerial Observatory (6 credit hours)

Namibia Wildlife Aerial Observatory (WAO) is restricted to junior-level and above students who participate in Namibia WAO study-abroad. The course is a purpose-driven educational experience of field work and research. The first 10 weeks take place in Namibia; of which during the first two weeks, the students receive lectures on such topics as African landscapes and wildlife, African culture, cross-cultural knowledge and skills, wildlife trade and poaching, data analysis for research, and are trained in the operation and maintenance of unmanned aerial vehicle systems (e.g. vehicles, cameras, communications) and in the following eight weeks are divided into field units that conduct aerial data collection for the purposes of meeting given wildlife missions. Upon returning to NC State, each field unit spends two-weeks (10 days) turning their findings into a research journal article for dissemination.

Junior standing or above

GEP Global Knowledge, GEP Interdisciplinary Perspectives

Typically offered in Fall only

E 490 Fundamentals of Engineering(FE) Exam Preparation (1 credit hours)

Preparation for graduating seniors in engineering to take the Fundamentals of Engineering (FE) Examination. Information on how to register for the FE exam, exam strategy, and a review of selected science and engineering topics through active learning exercises directed at working sample examination problems. Credit may not be counted toward graduation

Prerequisite: Engineering Majors, Senior standing, Graduate students, or PBS status

Typically offered in Fall and Spring

E 497 Engineering Research Projects (1-3 credit hours)

Projects in research, design or development in engineering or computer science. Individualized/Independent Study and Research courses require a Course Agreement for Students Enrolled in Non-Standard Courses be completed by the student and faculty member prior to registration by the department.

Prerequisite: Junior standing in College of Engineering, Engineering Scholars Program or Engineering Research Center Scholars

Typically offered in Fall, Spring, and Summer

E 531/OR 531/MA 531 Dynamic Systems and Multivariable Control I (3 credit hours)

Introduction to modeling, analysis and control of linear discrete-time and continuous-time dynamical systems. State space representations and transfer methods. Controllability and observability. Realization. Applications to biological, chemical, economic, electrical, mechanical and sociological systems.

Prerequisite: MA 341, MA 405

Typically offered in Fall only

E 731/MA 731/OR 731 Dynamic Systems and Multivariable Control II (3 credit hours)

Stability of equilibrium points for nonlinear systems. Liapunov functions. Unconstrained and constrained optimal control problems. Pontryagin's maximum principle and dynamic programming. Computation with gradient methods and Newton methods. Multidisciplinary applications.

Prerequisite: OR(E,MA) 531

Typically offered in Spring only

This course is offered alternate years