

Engineering Interdisciplinary (ENGR)

ENGR 5050. Advanced Engineering Calculus with Applications. 4 Hours.

Introduces methods of vector analysis. Expects students to master over thirty predefined types of problems. Topics include analytic geometry in three dimensions, geometric vectors and vector algebra, curves in three-space, linear approximations, the gradient, the chain rule, the Lagrange multiplier, iterated integrals, integrals in curvilinear coordinates, change of variables, vector fields, line integrals, conservative fields, surfaces and surface integrals, the flux and the circulation of a vector field, Green's theorem, the divergence theorem, and Stokes' theorem. Illustrates the material by real-world science and engineering applications using the above techniques. Requires familiarity with single-variable calculus.

ENGR 5670. Sustainable Energy: Materials, Conversion, Storage, and Usage. 4 Hours.

Examines, in this interdisciplinary course, modern energy usage, consequences, and options to support sustainable energy development from a variety of fundamental and applied perspectives. Emphasizes both (1) physical and chemical processes in materials for the conversion of energy and (2) how to design a system with renewable energy for applications such as electricity generation and transmission. Takes a systems analysis point of view. Topics may include energy conservation; fossil fuels; and energy conversion methods for solar, geothermal, wind, hydro, bioenergy, electrochemical, and similar methods.

ENGR 6962. Elective. 1-4 Hours.

Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

ENGR 7978. Independent Study. 1-4 Hours.

Offers theoretical or experimental work under individual faculty supervision. May be repeated without limit.

ENGR 9700. Doctoral Fieldwork. 0 Hours.

Offers students an opportunity to pursue experiential research outside the classroom and outside the university. Engineering PhD students only. May be repeated up to two times.

ENGR 9701. Engineering Teaching Practicum. 0 Hours.

Offers intermediate or terminal-level doctoral candidates a teaching assignment under the guidance of a faculty member. Typical activities include preparing and teaching recitations; preparing and teaching laboratory sessions; holding office hours; preparing and grading quizzes, problem sets, and other assignments; and assisting the instructor with other activities associated with teaching a course. All nonnative English speakers should conform to the university language requirements for teaching assistants. May be repeated up to five times.