ES F101  Introduction to Engineering  
3 Credits  
Overview of the engineering profession and introduction to the fields of  
engineering. Basic concepts from engineering, physics and mathematics  
applied to engineering problem solving. Basic skills required of engineers,  
including an introduction to engineering communications: word  
processing, descriptive geometry, orthographic and isometric drawings,  
graphs, computer graphics and use of spreadsheets. Prerequisite or Co-  
requisite: MATH F151X, or MATH F152X, or MATH F156X, or placement  
into MATH F251X.
Lecture + Lab + Other: 2 + 2 + 0

ES F166  Electric Car Conversion  
2 Credits  
Offered Summer  
An introduction to the principles of electrical vehicle propulsion systems.  
Fundamentals of electrical motors, electrical motor controls, electrical  
energy storage systems and automotive power-train design. Students will  
conduct practical design projects culminating with a complete electric  
car conversion. Relevant codes and standards will be emphasized.
Lecture + Lab + Other: 1 + 3 + 0

ES F201  Computer Techniques  
3 Credits  
Basic computer programming, in C/C++, with applications from all fields  
of engineering. Introduction to MATLAB.
Prerequisites: MATH F151X; MATH F152X; or MATH F156X, or enrollment  
in MATH F251X.
Lecture + Lab + Other: 1 + 3 + 0

ES F208  Mechanics  
4 Credits  
Engineering-oriented coverage of statics and dynamics. Vector methods  
used where appropriate. Prerequisites or Co-requisites: MATH F252X;  
PHYS F211X.
Prerequisites: ES F101 or GE F101 or MIN F103 or PETE F101.
Lecture + Lab + Other: 3 + 3 + 0

ES F209  Statics  
3 Credits  
Force systems in two and three dimensions. Composition and resolution  
of forces and force systems; principles of equilibrium applied to various  
objects, simple structures, friction, centroids, moments of inertia.  
Vector algebra used where appropriate. Prerequisites or Co-requisites:  
MATH F252X; PHYS F211X.
Prerequisites: ES F101.
Lecture + Lab + Other: 3 + 0 + 0

ES F210  Dynamics  
3 Credits  
Motion of particles, kinematics and kinetics of plane motion of rigid  
objects, and principles of work and energy, impulse and momentum.  
Vector methods used where appropriate.
Prerequisites: ES F209; MATH F252X.
Lecture + Lab + Other: 3 + 0 + 0

ES F301  Engineering Analysis  
3 Credits  
Application of numerical tools, including software, to typical engineering  
design problems. Selected topics from all fields of engineering.
Prerequisites: ES F201; Prerequisites or co-requisites: MATH F302.
Lecture + Lab + Other: 3 + 0 + 0