EAE 129 — Stability & Control of Aerospace Vehicles (4 units)
Course Description: Aircraft and spacecraft stability and control.
Derivation of fundamental equations of motion for aircraft/spacecraft.
Fundamentals of feedback. Aircraft flight control systems. Spacecraft attitude control systems.
Prerequisite(s): ENG 102 C- or better.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Enrollment Restriction(s): Restricted to upper division standing.
Grade Mode: Letter.
General Education: Science & Engineering (SE).

EAE 130A — Aircraft Performance & Design (4 units)
Course Description: Major aircraft design experience with multiple realistic constraints including aerodynamics, performance analysis, weight estimation, stability and control, and appropriate engineering standards.
Prerequisite(s): (EAE 126 or EAE 127 C- or better); EAE 129 C- or better (can be concurrent).
Learning Activities: Lecture 2 hour(s), Discussion 1 hour(s), Laboratory 3 hour(s).
Grade Mode: Letter.
General Education: Science & Engineering (SE).

EAE 130B — Aircraft Performance & Design (4 units)
Course Description: Major aircraft design experience with multiple realistic constraints including aerodynamics, performance analysis, weight estimation, stability and control, and appropriate engineering standards.
Prerequisite(s): ENG 102 C- or better.
Learning Activities: Lecture 2 hour(s), Discussion 1 hour(s), Laboratory 3 hour(s).
Enrollment Restriction(s): Restricted to upper division standing.
Grade Mode: Letter.
General Education: Science & Engineering (SE); Oral Skills (OL).

EAE 133 — Finite Element Methods in Structures (4 units)
Course Description: Introduction to the aerospace structural design process. History of aircraft and spacecraft materials. Effects of loading beyond elastic limit. Deflections and stresses due to combined loading. Virtual work principles, and finite element methods. Applications to aerospace structures.
Prerequisite(s): ENG 104 C- or better.
Learning Activities: Lecture 3 hour(s), Laboratory 3 hour(s).
Enrollment Restriction(s): Open to College of Engineering Students.
Grade Mode: Letter.
General Education: Science & Engineering (SE).

EAE 135 — Aerospace Structures (4 units)
Course Description: Analysis and design methods used in aerospace structures. Shear flow in open, closed and multicell beam cross-sections, buckling of flat and curved sheets, tension field beams, local buckling.
Prerequisite(s): ENG 104 C- or better; EAE 126 or EAE 127 recommended.
Learning Activities: Lecture 4 hour(s).
Grade Mode: Letter.
General Education: Science & Engineering (SE).
EAE 137 — Structural Composites (4 units)
Course Description: Overview of materials and technology for creating structures from fiber reinforced resin matrix composite material systems. Elementary design analysis and case studies emphasizing aeronautical applications.
Prerequisite(s): ENG 104 C- or better.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Grade Mode: Letter.
General Education: Science & Engineering (SE).

EAE 138 — Aircraft Propulsion (4 units)
Course Description: Analysis/design of modern aircraft gas turbine engines. Development/application of cycle performance prediction techniques. Introduction to design of inlets, compressors, burners, turbines, and nozzles. Cycle design for specific applications.
Prerequisite(s): EME 106 C- or better.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Grade Mode: Letter.
General Education: Science & Engineering (SE).

EAE 140 — Rocket Propulsion (4 units)
Course Description: Fluid and thermodynamics of rocket engines, liquid and solid rocket propulsion. Space propulsion concepts and space mission requirements.
Prerequisite(s): EME 106 C- or better.
Learning Activities: Lecture 4 hour(s).
Enrollment Restriction(s): Restricted to upper division standing.
Credit Limitation(s): Not open for credit to students who have taken identical EAE 189A prior to Fall Quarter 2013.
Grade Mode: Letter.
General Education: Science & Engineering (SE).

EAE 142 — Orbital Mechanics (4 units)
Course Description: Satellite orbits, multistage rockets, current global boosters, and new technologies. Design application problems include satellites, trajectory optimizations, and interplanetary trajectories.
Prerequisite(s): ENG 102 C- or better.
Learning Activities: Lecture 4 hour(s).
Enrollment Restriction(s): Restricted to upper division standing.
Credit Limitation(s): Not open for credit to students who have completed EAE 189B prior to Fall Quarter 2013.
Grade Mode: Letter.
General Education: Science & Engineering (SE).

EAE 143A — Space Vehicle Design (4 units)
Course Description: Governing equations and operational practices of robotic and human space travel. Principles of Systems Engineering are introduced and are used as a basis for a team project in spacecraft reverse-engineering and design.
Prerequisite(s): EAE 140 C- or better; EAE 142 C- or better.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Grade Mode: Letter.

EAE 143B — Space Mission Design (4 units)
Course Description: Introduction to space systems design including space project organization, requirements definition & specification, concepts formulation, system tradeoffs, and subsystem design. Prototype space mission concepts & multidisciplinary mission design.
Prerequisite(s): EAE 143A C- or better.
Learning Activities: Lecture 2 hour(s), Discussion 2 hour(s).
Enrollment Restriction(s): Open to Mechanical Engineering and Aerospace Science & Engineering majors only.
Credit Limitation(s): Not open for credit to students who have completed EAE 141.
Grade Mode: Letter.

EAE 189C — Flight Simulation & Testing in Design of Aircraft & Spacecraft (4 units)
Course Description: Teaches flight test techniques together with data analysis methods to prepare students for any type of flight testing including fixed wing, rotary wing and launch vehicles.
Prerequisite(s): ENG 102; consent of instructor.
Learning Activities: Lecture 3 hour(s), Laboratory 3 hour(s).
Grade Mode: Letter.
General Education: Science & Engineering (SE).

EAE 198 — Directed Group Study (1-5 units)
Course Description: Directed group study.
Prerequisite(s): Consent of instructor.
Learning Activities: Variable 1-5 hour(s).
Grade Mode: Pass/No Pass only.

EAE 199 — Special Study for Advanced Undergraduates (1-5 units)
Course Description: Special study for advanced undergraduates.
Prerequisite(s): Consent of instructor.
Learning Activities: Variable.
Grade Mode: Pass/No Pass only.