EAE 099 — Special Study for Undergraduates (1-5 units)

Course Description: Special study for undergraduates.
Prerequisite(s): Consent of instructor; lower division standing.
Learning Activities: Variable.
Grade Mode: Pass/No Pass only.
General Education: Science & Engineering (SE) or Social Sciences (SS).

EAE 126 — Theoretical & Computational Aerodynamics (4 units)

Course Description: Development of general equations of fluid motion. Study of flow field kinematics and dynamics. Flow about a body. Thin airfoil theory. Viscous effects. Applications of numerical methods to wing analysis and design.
Prerequisite(s): ENG 103 C- or better; ENG 105 C- or better; ENG 180 C- or better or EAD 115 C- or better or MAT 128C C- or better or EME 115 C- or better.
Learning Activities: Lecture 3 hour(s), Discussion 1 hour(s).
Grade Mode: Letter.
General Education: Science & Engineering (SE).

EAE 127 — Applied Aircraft Aerodynamics (4 units)

Course Description: Principles, governing equations, and predictive theories for aircraft aerodynamics. Lift and drag of 2D airfoils, 3D wings, and high-lift devices.
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 129 — Stability & Control of Aerospace Vehicles (4 units)

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 including detailed design, cost analysis, analysis of aircraft structure, propulsion system, aerodynamics, aircraft handling qualities, manufacturing, or meeting relevant engineering standards.
Prerequisite(s): EAE 130A 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).
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 143C — 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 189A — 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 189B — 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 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 189D — 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 189E — 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.