

AEROSPACE ENGINEERING (AEE)

AEE 100 Selected Topics (1-6 Credits)

Engineering & Comp Sci

Exploration of a topic (to be determined) not covered by the standard curriculum but of interest to faculty and students in a particular semester. Repeatable

AEE 270 Experience Credit (1-6 Credits)

Engineering & Comp Sci

Participation in a discipline- or subject-related experience. Students must be evaluated by written or oral reports, or an examination. Limited to those in good academic standing. Repeatable

AEE 290 Independent Study (1-6 Credits)

Engineering & Comp Sci

In-depth exploration of a problem or problems. Individual independent study upon a plan submitted by the student. Admission by consent of supervising instructor or instructors and the department. Repeatable

AEE 300 Selected Topics (1-6 Credits)

Engineering & Comp Sci

Exploration of a topic (to be determined) not covered by the standard curriculum but of interest to faculty and students in a particular semester. Repeatable

AEE 342 Aerodynamics (4 Credits)

Engineering & Comp Sci

Vorticity, circulation, potential flow and superposition of flows. Lift, drag, moments of two- and three-dimensional wings. Thin airfoil theories. Panel methods. Lifting-line theory. Flow separation and stall. Viscous drag reduction.

Prereq: MAE 341

Shared Competencies: Critical and Creative Thinking (<https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/>); Information Literacy and Technological Agility (<https://coursecatalog.syracuse.edu/shared-competencies/information-literacy-and-technological-agility/>)

AEE 343 Compressible Flow (3 Credits)

Engineering & Comp Sci

Isentropic flow, normal and oblique shock waves, expansion fans. Compressible flow in converging and diverging nozzles. Course includes lab component with written report.

Prereq: MAE 251 and 341

Shared Competencies: Critical and Creative Thinking (<https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/>); Communication Skills (<https://coursecatalog.syracuse.edu/shared-competencies/communication-skills/>); Scientific Inquiry and Research Skills (<https://coursecatalog.syracuse.edu/shared-competencies/scientific-inquiry-and-research-skills/>)

AEE 371 Analysis of Aerospace Structures (3 Credits)

Engineering & Comp Sci

Structural configuration of modern aircraft and spacecraft; symmetric and unsymmetric beams; single and multicell thin-walled tubes; skin-stringer construction; shear flow; ring, frame and fuselage analysis.

Prereq: ECS 325

Shared Competencies: Critical and Creative Thinking (<https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/>); Civic and Global Responsibility (<https://coursecatalog.syracuse.edu/shared-competencies/civic-and-global-responsibility/>)

AEE 380 International Course (1-12 Credits)

Engineering & Comp Sci

Offered through SUAbroad by educational institution outside the United States. Student registers for the course at the foreign institution and is graded according to that institution's practice. SUAbroad works with the SU academic department to assign the appropriate course level, title, and grade for the student's transcript.

Repeatable

AEE 400 Selected Topics (1-6 Credits)

Engineering & Comp Sci

Exploration of a topic (to be determined) not covered by the standard curriculum but of interest to faculty and students in a particular semester. Repeatable

AEE 427 Aircraft Performance and Dynamics (4 Credits)

Engineering & Comp Sci

Wing aerodynamic, thrust and drag. Performance analysis of aircraft: take-off, landing, climbing, gliding, turns, range and load factors. Control surfaces. Longitudinal and lateral static stability. Dynamic stability. Introduction to autopilot.

Prereq: MAE 341

Shared Competencies: Critical and Creative Thinking (<https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/>)

AEE 435 Aerospace Structures (0 Credits)

Engineering & Comp Sci

AEE 446 Air-breathing and Rocket Propulsion (3 Credits)

Engineering & Comp Sci

Fluid dynamics and thermodynamics of airbreathing engines, including gas turbine, ramjet and scramjet. Engine component analysis, including inlets, combustors, nozzles, and turbomachines. Introduction to rocket propulsion.

Prereq: AEE 343

Shared Competencies: Critical and Creative Thinking (<https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/>); Scientific Inquiry and Research Skills (<https://coursecatalog.syracuse.edu/shared-competencies/scientific-inquiry-and-research-skills/>)

AEE 461 Design of Aerospace Systems I (3 Credits)

Engineering & Comp Sci

Conceptual design of aerospace systems. Methodologies for aerospace vehicle synthesis and sizing. Modeling and simulations in design. Integration of aerospace technologies. Preliminary analysis of an assigned aerospace component, system, or vehicle. Oral and written reports.

Prereq: AEE 342 and AEE 371

AEE 470 Experience Credit (1-6 Credits)*Engineering & Comp Sci*

Participation in a discipline- or subject-related experience. Students must be evaluated by written or oral reports or an examination. Limited to those in good academic standing.

Repeatable

AEE 472 Design of Aerospace Systems II (3 Credits)*Engineering & Comp Sci*

Design of an aerospace component, system, or vehicle to meet specified performance and cost criteria. Vehicle options include subsonic, supersonic, or VTOL aircraft; a missile system; or a spacecraft. Oral and written preliminary and final reports.

Prereq: AEE 461 and (AEE 427 or AEE 577)

Shared Competencies: Critical and Creative Thinking (<https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/>); Scientific Inquiry and Research Skills (<https://coursecatalog.syracuse.edu/shared-competencies/scientific-inquiry-and-research-skills/>)

AEE 480 International Course (1-12 Credits)*Engineering & Comp Sci*

Offered through SUAbroad by educational institution outside the United States. Student registers for the course at the foreign institution and is graded according to that institution's practice. SUAbroad works with the SU academic department to assign the appropriate course level, title, and grade for the student's transcript.

Repeatable 1 times for 12 credits maximum

AEE 490 Independent Study (1-6 Credits)*Engineering & Comp Sci*

In-depth exploration of a problem or problems. Individual independent study upon a plan submitted by the student. Admission by consent of supervising instructor or instructors and the department.

Repeatable

AEE 491 Hypersonics Research Project I (1-3 Credits)*Engineering & Comp Sci*

In depth exploration of a problem in the field of hypersonics under the supervision of a faculty member. Projects may be experimental or computational research on hypersonic phenomena, or a conceptual study of hypersonic vehicles.

AEE 492 HypHypersonics Research Project II (1-3 Credits)*Engineering & Comp Sci*

Advanced research on a problem in the field of hypersonics under the supervision of a faculty member. Projects may be experimental or computational research on hypersonics phenomena, or a conceptual study of hypersonic vehicles.

AEE 499 Honors Capstone Project (1-3 Credits)*Engineering & Comp Sci*

Completion of an Honors Capstone Project under the supervision of a faculty member.

Repeatable 3 times for 3 credits maximum

AEE 500 Selected Topics (1-6 Credits)*Engineering & Comp Sci*

Exploration of a topic (to be determined) not covered by the standard curriculum but of interest to faculty and students in a particular semester.

Repeatable

AEE 527 Helicopter Dynamics (3 Credits)*Engineering & Comp Sci*

Introduction to the helicopter; hover- and vertical-flight analysis; autorotation and vertical descent; blade motion and rotor control; aerodynamics of forward flight.

Prereq: AEE 342 and 427

AEE 542 Hypersonic/High Temperature Gas Dynamics (3 Credits)*Engineering & Comp Sci*

Inviscid and viscous hypersonic fluid dynamics with and without high temperature effects. Approximate and exact methods for analyzing hypersonic flows. Elements of statistical thermodynamics, kinetic theory, and nonequilibrium gas dynamics. Experimental methods.

Prereq: MAE 251 and AEE 343

AEE 577 Introduction to Space Flight (3 Credits)*Engineering & Comp Sci*

Two-body orbital mechanics, orbits and trajectories, interplanetary transfers, vehicle and booster performance.

Prereq: ECS 222

Shared Competencies: Critical and Creative Thinking (<https://coursecatalog.syracuse.edu/shared-competencies/critical-and-creative-thinking/>); Scientific Inquiry and Research Skills (<https://coursecatalog.syracuse.edu/shared-competencies/scientific-inquiry-and-research-skills/>)