Aerospace Engineering (AESP)

AESP 101 - Introduction into Aerospace Engineering (3 Credits)
Historical overview of air and space flight. Principles of flight and characterization of the atmosphere and space. Vehicle concepts, and an introduction to aerodynamics, materials, structures, propulsion, flight mechanics, control, aircraft systems, and design.

AESP 265 - Aerodynamics I Incompressible Flow (3 Credits)

Prerequisites: MATH 242, EMCH 201.

AESP 314 - Energy Power and Propulsion (3 Credits)
Introduction to aircraft and rocket engines with emphasis on the performance and characteristics of various types of propulsion systems, including turbojet, turboprop, turboprope, ramjet, scramjet and liquid & solid propellant rockets.

Prerequisites: EMCH 290.

AESP 350 - Aerospace Systems (3 Credits)
Fundamentals of flight control systems, engine control systems, fuel systems, hydraulic systems, landing gears, electrical systems, environmental control systems, emergency systems, avionics and rotary wing systems. Aerospace systems design and development methodology.

Prerequisites: PHYS 212.

AESP 361 - Aerospace Laboratory I (3 Credits)
Aerospace component experiments: drag polar and Cm-alpha curve for an airfoil; fuselage and landing gear drag; compliance matrix of an isotropic and a laminated composite; mechanical and thermal properties of various aerospace materials; reporting.

Prerequisites: STAT 509, AESP 265.

Prerequisite or Corequisite: EMCH 371, EMCH 310.

AESP 362 - Aerospace Laboratory II (3 Credits)
Introduction to experimental determination of structures, propulsion and systems aspects of aerospace engineering. Oral and written presentations and reports.

Prerequisites: AESP 361.

AESP 415 - Aircraft Design Part I Basics (3 Credits)
Aircraft mission analysis; Conceptual aircraft design; Weight estimation; Wing design; Payload compartment design; Stabilizer and control surface design; engine selection; aircraft systems design; performance analysis; trade studies; design verification; design documentation and presentation.

Prerequisites: AESP 265.

Prerequisite or Corequisite: AESP 350 and AESP 314.

Graduation with Leadership Distinction: GLD: Research

AESP 420 - Flight and Orbital Mechanics (3 Credits)
Derivation of the general equations of motion (EoM) for aircraft and space flight. Solution of Aircraft EoM for cruise flight and flight maneuvers including coordinated turns, takeoff and landing. Solution of EoM for orbital mechanics problems including transfer trajectories. Calculation of required specific impulses. Design of interplanetary trajectories.

Prerequisites: MATH 141, EMCH 200, EMCH 310.

AESP 428 - Design I (3 Credits)

Prerequisites: AESP 350, EMCH 577.

Prerequisite or Corequisite: AESP 314, EMCH 377.

Graduation with Leadership Distinction: GLD: Research

AESP 466 - Flight Dynamics and Control (3 Credits)
Flight Dynamics and Control is a three-credit course that covers the dynamics of aircraft motion, methods of analysis and design for stability and control, longitudinal motions, lateral-directional motions, and coupled longitudinal and lateral-directional motions.

Prerequisites: EMCH 330 or ENCP 330, AESP 420.