Aerospace Applications in Mechanical Engineering - ME 411 - 4 credits (LECTURE HOURS)

Instructor / Office Hours
Roberto Albertani, Rogers 412, roberto.albertani@oregonstate.edu / TBD

Teaching Assistants
TBD, Office hours: TBD

Textbook:

Useful References
• Bruhn, E. E.: Analysis and Design of Flight Vehicle Structures, Tri-State Offset Company
• Perkins, C.D., Hage, R.E., Airplane Performance, Stability and Control, Wiley.
• FAA current regulations: http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&tpl=/ecfrbrowse/Title14/14tab_02.tpl
• Aircraft Design: Synthesis and Analysis (http://adg.stanford.edu/aa241/AircraftDesign.html)

Prerequisites: ME 316, ME 317, ME 331 and ME 373, or equivalent.

Course Description:
This course provides students with the fundamentals of mechanical engineering applications to aerospace. Topics covered include an overview of modern aircraft and spacecraft analysis, with an emphasis on performance, stability, structures, materials, FAA and FAR standards and current professional practices in the conceptual design of aerospace vehicles. Student projects will integrate course topics.
This course combines approximately 120 hours of instruction, and assignments for 4 credits.

Course Learning Outcomes
The student, upon completion of this course, will be able to:
1- Formulate the equations that describe the performance, flight mechanics and stability of an aerospace vehicle.
2- Apply knowledge of mechanics of solids and material selection in the design of aerospace structures.
3- Specify performance characteristics to meet specific mission requirements and estimate vehicle performance.
4- Formulate a conceptual design of an aerospace vehicle that meets current aerospace industry standards and regulations.

Electronic File Access
Files, assignments, examples, solutions and announcements will be posted on Canvas.

Homework and Project
Homework will include problems and reverse engineering of an existing air vehicle applying class topics. Homework constitute an integral part of the class’ instruction and training for exams.

Midterms and final exam
Midterms and final exams are closed book, except for one 8.5"x11" page of notes, written in any density on both sides (you may bring a magnifier if you wish to write very small). Notes sheet must be HANDWRITTEN and WILL be turned with the exam. NO sheet NO grade. Exams must show all appropriate steps to obtain final result. Intermediate and final result must have appropriate precision requirements (posted on Canvas). No make-up exams except for a medical emergency, e.g. illness or accident, in which case a physician’s certification is required. You must notify the instructor before the scheduled exam.

ALL results MUST have the appropriate dimensions and number of significant figures (PRECISION).

Grading
25% homework, 25% three exams BEST of four (three midterms and final).

Grades are on an absolute scale (A=94+, A-=91+, B+=87+, B=83+, B-=81+, C+=76+, C=71+, D+=66+, D=61+).

Academic Dishonesty
You will be expected to conduct yourself in a professional manner. Academic dishonesty such as plagiarism and cheating will not be tolerated. Therefore, students are expected to be honest and ethical in their academic work.
Academic dishonesty is defined as an intentional act of deception in one of the following areas:
* cheating- use or attempted use of unauthorized materials, information or study aids,
* fabrication- falsification or invention of any information,
* assisting- helping another commit an act of academic dishonesty,
* tampering- altering or interfering with evaluation instruments and documents, or
* plagiarism- representing the words or ideas of another person as one's own.
For more information about academic integrity and the University's policies and procedures in this area, please refer to the Statement of Expectations for Student Conduct, link at: http://studentlife.oregonstate.edu/studentconduct/offenses-0 and the section on Academic Regulations in the OSU Schedule of Classes.

Statement Regarding Students with Disabilities:
Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 737-4098.

Tentative Schedule: TBD