

EAS 4700 – AEROSPACE DESIGN 1 (3 credits) - FALL 2020
***** Syllabus (a.k.a. our contract for the semester) *****

COURSE INSTRUCTORS:

Dr. Ting Dong. Office hours: Email: dting0603@ufl.edu TBD (online until directed otherwise).

Mr. Michael Generale. Email: Mgenerale@ufl.edu. Office Hours: By appointment (online until directed otherwise).

CLASS WEBSITE: CANVAS

CLASS MEETS: M, W, periods 9-10 (4:05pm-6:00pm), ON LINE ONLY (LAR 330 in the event it is safe to meet in person).

GRADING ASSISTANT: Mr. Jacob Reichhardt. Email: JReichhardt@ufl.edu .

PRE-REQUISITES: EAS4510 and EML4312 with at least D grade. Working knowledge of MATLAB, Simulink, and a CAD program is required. Student will have to learn tools as they go.

COURSE OBJECTIVES: By the end of this course, you should be able to do the following:

1. Prepare technical documents in aerospace industry in a timely fashion.
2. Give technical presentations, develop communication skills.
3. Work in team / lead a team environment to develop design alternatives, and select the best aircraft design.
4. Find and apply technical knowledge you need to solve new problems using a systems engineering approach.
5. Understand the concepts of Systems Engineering and Project Management.

COURSE DESCRIPTION: This course introduces all elements of the spacecraft design process. Students are organized into design teams and associated with different subsystems and tasks, to develop a solution to a space vehicle system's problem of practical interest, by drawing on their background in aerospace engineering science, machine design, and manufacturing methods. Topics include problem definition and requirement analysis, design specifications, concept development, reliability, consideration of alternative solutions, materials considerations, engineering prototyping, mission analysis, costs, and presentation skills. This is a communication-intensive and writing-intensive course.

For this semester, a set of design requirements for an uncrewed suborbital lunar transport. See document at the end of the syllabus. The table below provides a tentative

schedule for this course. See the class CANVAS site for latest information. The teams will meet around 26 times, and most of the meetings will be design work time.

TEXTBOOK/SOFTWARE:

Suggested texts are:

1. Space Mission Analysis and Design, 3rd edition, by James Wertz
2. Human Spaceflight Mission Analysis and Design, Second Edition, by Larson, Pranke and McQuade

You must have access to MATLAB and a CAD program such as SolidWorks. It is suggested you have STK installed on individual machines, with running license. More requirements may arise during the semester.

PRESENTATIONS AND REPORT:

Midterm (**Week of Oct. 12 2020, scheduled as needed**) and final (**Week of Dec. 7, 2020, scheduled as needed**) presentations will be given to the instructor and customer, **20% each**. A final report, in the format of a student competition conference paper for the small satellite conference will be due **Dec. 7, 2020, 40%** (conference website: <https://www.smallsat.org/> , paper template: <https://smallsat.org/downloads/paper-template.pdf>).

Each member of each team will evaluate his/her peers. **This peer evaluation is 20% of the grade.**

MIDTERM SURVEY: A voluntary mid-term survey will be provided, **due Oct 16**. To incentivize your participation, the survey will be valued as 5% **bonus**.

GRADING POLICY: The grading scale is as follows:

A: 94 to 100
A-: 90 to 93.99
B+: 85 to 89.99
B: 80 to 84.99
B-: 75 to 79.99
C+: 70 to 74.99
C: 65 to 69.99
C-: 60 to 64.99
D+: 55 to 59.99
D: 50 to 54.99
D-: 45 to 49.99
E: Less Than 45

COURSE ASSESSMENT MEASURES FOR ABET:

The following table shows which ABET Student Learning Outcomes (SLO) are targeted by this course.

Outcome	Coverage*
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	High
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	High
3. An ability to communicate effectively with a range of audiences	High
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	High
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	High
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	High
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Medium

*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not covered or assessed in the course.

The following table maps assignments to SLOs. It shows how each SLO is assessed.

Assessment	Student Learning Outcomes
Final Report	1,2,3,4,5,6,7
Presentations	1,2,3,4,5,6,7
Peer grading	3,4,5

REFERENCE CANVAS FOR CURRENT CALENDAR

Week No.	Mod. No.	Topic	Date
1	1	<i>Introduction, Syllabus Review, Introduction to Project Management/Vehicle Design Requirements Vehicle Design Review</i>	08/31/20
1	2	<i>Team Assignments / Requirements Development and Verification/ Schedules Development</i>	09/02/20
2	-	LABOR DAY HOLIDAY – NO CLASS	09/07/20
2	3	<i>Assessing Risk: Problem Analysis-Decision Analysis / Concept of Operation/Elements of a Design Review</i>	09/09/20
3	4	<i>Designing for Manufacture & Maintenance / Team work time</i>	09/14/20
3	5	Team work time	09/16/20
4	6	Team work time	09/21/20
4	7	Team work time	09/23/20
5	8	Team work time	09/28/20
5	9	Team work time	09/30/20
6	10	Team work time	10/05/20
6	11	Team work time	10/07/20
PDR SESSION 1			
7	12	Presentations turned in to CANVAS NLT 11:59 PM 10/11/20 ++ NO EXCEPTIONS++	10/12/20
PDR SESSION 2			
7	13	Presentations turned in to CANVAS NLT 11:59 PM 10/13/20 ++ NO EXCEPTIONS++	10/14/20
8	14	Team work time	10/19/20
8	15	Team work time	10/21/20
9	16	Team work time	10/26/20
9	17	Team work time	10/28/20
10	18	Team work time	11/02/20
10	19	Team work time	11/04/20
11	20	Team work time	11/09/20
11	-	VETERANS' DAY – NO CLASS	11/11/20
12	21	Team work time	11/16/20
12	22	Team work time	11/18/20
CDR Session 2			
13	23	Presentations turned in to CANVAS NLT 11:59 PM 11/22/20 ++ NO EXCEPTIONS++	11/23/20
CDR Session 1			
13	24	Presentations turned in to CANVAS NLT 11:59 PM 11/24/20 ++ NO EXCEPTIONS++	11/25/20
14	25	Team work time	11/30/20
14	26	Team work time	12/02/20
Final Report Due			
15	27	Final Report turned in to CANVAS NLT 11:59 PM ++ NO EXCEPTIONS++	12/07/20
15	28	FINALS WEEK	12/14/20

Online Course Recording: Due to the COVID-19 pandemic, this course will be presented 100% online. As a result, the following needs to be understood by all students:

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

CLASS ATTENDANCE AND MAKE UP POLICY

Students are expected to attend all meetings. There will be no early/late exams. Please make your travel arrangements according to the exam dates specified in the syllabus. The general rule is no make-up exams and no rescheduling of exams to other times.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

The students remain completely responsible for timely communications with the instructor.

STUDENTS WITH DISABILITIES

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. **Students with disabilities should follow this procedure as early as possible in the semester. In other words: immediately at the beginning.**

CHEATING POLICY

There is absolutely zero tolerance for cheating. Your examinations must be completed completely independently. If anyone is caught having worked together on an exam or having used an unauthorized source, the penalty is an automatic failure of the course. Cheating breaks the mutual trust between instructor and student. Cheating will invariably result in an automatic "E" grade and the incident will be reported to the University.

Familiarize with the concept of plagiarism as well – plagiarized work is cheating.

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Students should also familiarize with the Code of Ethics for Engineers: <http://www.nspe.org/resources/ethics/code-ethics>

ONLINE STUDENTS COURSE EVALUATION

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

The instructors will also provide a midterm evaluation form to the students, to monitor the development of the class, and make necessary adjustments, when possible. We value your input, and that is why we are giving you an incentive to complete this optional survey at mid-semester. See also grading policy for points assigned to this survey.

CLASS DEMEANOR EXPECTED BY THE INSTRUCTORS

We have little tolerance for students who are repeatedly late to class, cell phone ringing, text messages beeps, and any behavior that may be distracting both students and instructor. You are expected to mute your microphones for ZOOM meeting class sessions. Offenders will be asked to either mute their microphones or leave the meeting, and the lecture will not resume until they comply. If they do not comply, the lecture will be given for granted and the instructors will move on.

Also, we will not be eating while teaching (obviously!), and we expect you not to eat in class.

CONTACT INFORMATION FOR THE COUNSELING AND WELLNESS CENTER

We live in stressful times. If you feel like you need help, you are not alone. Help is available <http://www.counseling.ufl.edu/cwc/Default.aspx>, 392-1575; and the **University Police Department**: 392-1111 or 9-1-1 for emergencies.