ASEN 1400 / ASTR 2500

Syllabus, Spring 2019

Summary

Gateway to Space is a course designed to grant students experience in designing, building, and flying a small payload on a weather balloon. This course will demand teamwork, and many hours building, programming, testing and analyzing data collected during a weather balloon flight. Students should expect multiple required extra classroom sessions to support reviews, launch and specialty skill workshops. At the end of the semester, the students should be able to; apply the engineering process to future projects, evaluate a balloonsat design and performance, and analyze and explain collected data from the balloon flight.

Lecture:

ITLL 1B50 Tues. and Thur. 9:30 - 10:45 AM

Instructor:

Geoffrey Lake
Email: geoffrey.lake@colorado.edu
Office Hours: Tues 11AM - 12PM, Location: Seebass Forum Room (ECAE 153)
Thurs 8:15 – 9:15AM, Location: Seebass Forum Room (ECAE 153)

Course Assistants:

The course assistants are a great resource for your class. Each has taken the class before and is familiar with the building of a balloonsat, as well as being on teams. Students are expected to utilize their knowledge. Course assistants will provide 1 hour a week in scheduled office hours. They are also available for an additional hour per week to meet by appointment, or answer email.

Shannon Chott
Email: shch2534@colorado.edu
Office Hours: 1:00pm - 2:00pm
Location: ITLL Mezzanine

Sara Reitz
Email: Sara.Reitz@colorado.edu
Office Hours: Mon 10:00am – 11:00am

Location: Aerospace Breakout Room

Alexis Sotomayor
Email: Alexis.Sotomayor@colorado.edu
Office Hours: Wed 3:00pm - 4:00pm
Location: TBD

Internet Information

Class website on Canvas (canvas.colorado.edu) will be used to post and submit assignments.

Email List: The course email list provided through Canvas will be utilized for the course email list. Make sure you enable email notifications from Canvas.

Prerequisites

There are no prerequisites for this class.

Learning Goals

The goals of this class are to prepare you for a career in engineering and science through an introduction to the engineering process, and common lifecycle phases of a space program. This course will require that you understand and utilize the engineering process and program lifecycle as well as develop the necessary skills to design, build, test, launch and analyze a balloonsat. In addition, the course intends to introduce all students to the complexity of effective teaming through the project-based course. Finally, the course intends to develop the necessary presentation and communication skills necessary to work effectively in a team and with stakeholders.

Course Calendar

Refer to Schedule 2019 document posted on Canvas (https://canvas.colorado.edu).

Required Hardware

As part of the course you will design, build, and fly a balloonsat. The Aerospace Engineering Sciences (AES) department has invested in many components which will make up your balloonsat, including data loggers, Arduino computers, goPro cameras, and other commonly used components.

The course will **loan** you equipment that includes, but is not limited to; Arduino, GoPro, accelerometers, temperature sensors, soldering irons, etc…The equipment is the property of the AES department and you are responsible for treating all the hardware appropriately and will be held responsible for fixing or replacing the hardware. ALWAYS place the hardware in the provided padded anti-static bags and cases when not in use, and do not expose to excessive heat (i.e. do not leave in your car!).

Some equipment is consumable (replaced every semester) and is your responsibility to acquire and bring to class. Many of these items are used by your team and can be cost shared. ***Some*** items that you will need to acquire through the semester are:

9-Volt batteries (to power your balloonsat)

Dry ice (for thermal testing of balloonsat)

More details will be presented throughout the semester. Your program will require the purchase, integration and analysis of an additional payload. Your team will get up to a $200 budget to purchase all required sensors and hardware to complete that payload.

Overview

Workshops will be held to instruct students in Arduino coding, and soldering. These will begin for the entire class in the scheduled time slot, with additional instruction for a subset of the teams at a later time. All students are expected to attend the scheduled time workshop and teams will designate attendees for the detailed workshops.

Reviews will be held throughout the semester, where each team will present the progress and results of their balloonsat development to the instructor, course assistants and fellow classmates. Reviews consist of a team presenting their material and then answering questions

d. All students on a team will present a minimum of 2 times within the semester. Teams may sort who speaks at their discretion.

3. **In class team time**
   a. Teams are expected to utilize in-class team time to assemble their satellite with teacher supervision. All students are expected to attend at the beginning and may break up into smaller teams and leave after attendance is taken and announcements are made.
4. **Inter-team Collaboration**
   a. Teams are allowed to collaborate between each other, **but may not share code that is not provided by the instructor unless explicitly approved by the instructor.** Approval may be granted if program managers from 2 groups formulates an agreement and presents it to the instructor. Sharing of code between teams without approval from the instructor will result in disciplinary action.

Course Grading

The course is graded half on an individual basis, and half on a team basis. Figure 1 summaries the percentages of your grade.

Attendance will be taken every day. Sign only for yourself and no other students. Signing for another student will be considered cheating and a violation 0.2 (de)r 0 1 14Tf -0.2 4TfH

If you have taken and passed this test in the past and can provide proof to the professor, you will get credit for this portion of the assignment without re-taking it.

Throughout the semester there will be some individual homework and some team homework. Each student on a team will turn in the same homework as well as a factor sheet. The factor sheet is an assessment of the level of effort of your peers. Your individual grade will be the product of the team grade and the average of the factor from your fellow team members. For example, if the team grade is 89/100, and your team members have given you the following LOE factors (.2, .5, .6, 1, 1, 1, 1), then your total grade would be .89*AVG(LOE) = 67/100.

Peer reviews will be given out to teams 2 times during the semester. Each student will grade and comment on their teammates. These reviews will require justification of assigned grades and specific examples where a reviewed team member excelled, or did not meet expectations.

Team grades will be assigned based on completed documentation as well as presentation. Reviews shall be graded by course assistants and instructor both from presentation material, presentation quality and question and answer phases. During reviews, a subset of the team will present, though all team members may be available to answer questions.

Grading Disputes

If you feel that a homework, exam, or review has been graded incorrectly you must submit your complaint in writing to the instructor. All complaints must be filed within 1 week after the assignment has been returned to the class. Your written request must clearly state your complaint. Be aware the entire assignment may be re-graded during the re-assessment process.

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