ASEN 5148 Spacecraft Design

Syllabus Spring 2019

Instructors   Dr. Daniel Kubitschek
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by appointment

oom (https://cuboulder.zoom.us/j/7379984488)

2L/Canvas

pacecraft Systems Engineering – Fortescue, Swinerd & Stark

930-1045 Monday and Wednesday
lassroom ECCS 1B12
Zoom Meeting ID: **258-156-979**

Recorded lectures: Canvas

Course Description

1. This course will study the fundamental concepts of Spacecraft Design with emphasis on the important aspects of systems and subsystems engineering
2. A preliminary design for three missions will be developed and presented at a Preliminary/Critical Design Review (PDR/CDR) at the end of the semester
3. Design teams (3 teams per project) will compete for the winning design to be selected, following the PDR, by the Principal Investigator (Blue Sun Enterprises, Inc. & LASP)

Distances student taking the course for CU academic credit will participate as distributed team members, requiring each team to accommodate and coordinate with their distance team member(s) as necessary.

Curriculum

This is a lecture and discussion course centered on developing and presenting the spacecraft preliminary design for a spaceflight mission. Individual lectures cover the spacecraft systems and subsystems. The course assumes the student has no previous experience in spacecraft design.

Course Objectives

1. To convey the important aspects of systems and subsystems engineering
2. To simulate a realistic spacecraft design process
3. To develop the preliminary design for a small spacecraft

Content

MISSION DESIGN

SYSTEMS ENGINEERING

COMMAND & DATA HANDLING SUBSYSTEMS

POWER & ELECTRICAL SUBSYSTEMS

THERMAL SUBSYSTEMS

TELECOMMUNICATION SUBSYSTEMS

FLIGHT & SIMULATION SOFTWARE SUBSYSTEMS

ATTITUDE DETERMINATION & CONTROL SUBSYSTEMS

GUIDANCE, NAVIGATION & CONTROL SUBSYSTEMS

PROPULSION SUBSYSTEMS

STRUCTURES & MECHANISMS SUBSYSTEMS

FAULT PROTECTION

ASSEMBLY, INTEGRATION & TEST

OPERATIONS

Grading

The course grade will be based on homework, Conceptual Design Review (CoDR) Presentation, Preliminary/Critical Design Review (PDR/CDR) Presentation, Design Documentation and Customer Assessment

Homework	20%	Late homework submission requires instructor consent
CoDR Presentation	20%	All team members shall present
PDR Presentation	40%	All team members shall present
Customer Evaluation	20%	
Bonus	5 pts	Winning team for each Project

Accommodation for Disabilities

All faculty assume responsibility for ensuring that their individual courses and content are accessible to all students. Please utilize principles of Universal Design when creating new

with an Access Coordinator, contact Disability Services at dsinfo@colorado.edu or 303-492-8671

Disabilities syllabus statement:

If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the [Disability Services website](). Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance. If you have a temporary medical condition or injury, see [Temporary Medical Conditions]() under the Students tab on the Disability Services website.

Classroom Behavior

Faculty and students should be aware of the campus [Classroom and Course-Related Behavior policy]() which describes examples of unacceptable classroom behavior and provides information on how to handle such circumstances should they arise. Faculty are encouraged to address the issue of classroom behavior in the syllabus, and to understand their [professional rights and duties]().

Classroom behavior syllabus statement:

Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early

in the semester so that I may make appropriate changes to my records. For more information, see the policies on [classroom behavior](#) and the [Student Code of Conduct](#).

Honor Code

The Boulder campus has an [Academic Integrity Policy](#) and a [student Honor Code](#); individual faculty members are expected to familiarize themselves with its tenets and follow the approved procedures should violations be perceived. The campus has been working diligently to make this process work better and to provide guidance on 'gray areas' at the [Honor Code website](#).

Honor Code syllabus statement:

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code. Violations of the policy may include: plagiarism, cheating,

Individuals who believe they have been subject to misconduct or retaliatory actions for reporting a concern should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127 or cureport@colorado.edu. Information about the OIEC, university policies, anonymous reporting, and the campus resources can be found on the OIEC website.

Please know that faculty and instructors have a responsibility to inform OIEC when made aware of incidents of sexual misconduct, discrimination, harassment and/or related retaliation, to ensure that individuals impacted receive information about options for reporting and support resources.

Religious Holidays

See the [campus policy regarding religious observances](#) for full details.