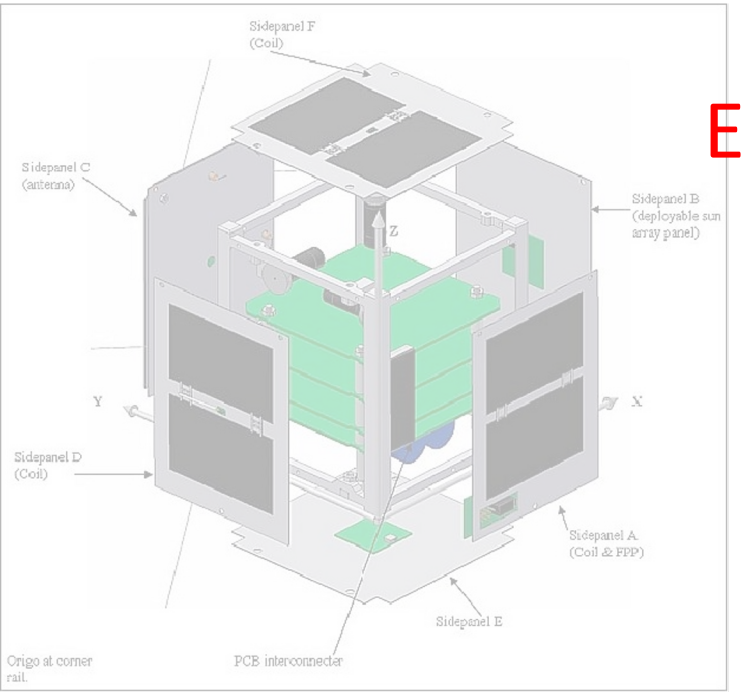
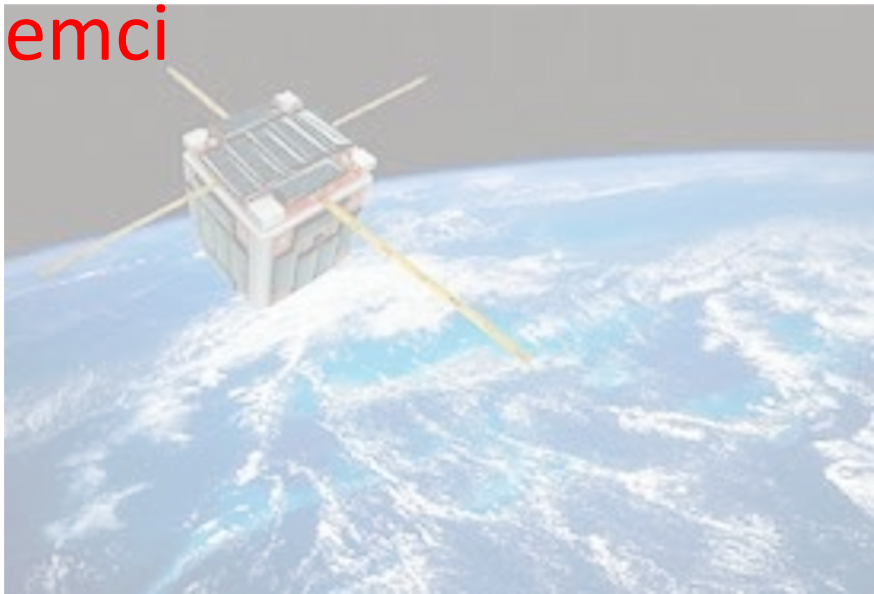
ENS 303
Introduction to Space Technology
Syllabus

Emrah Kalemci



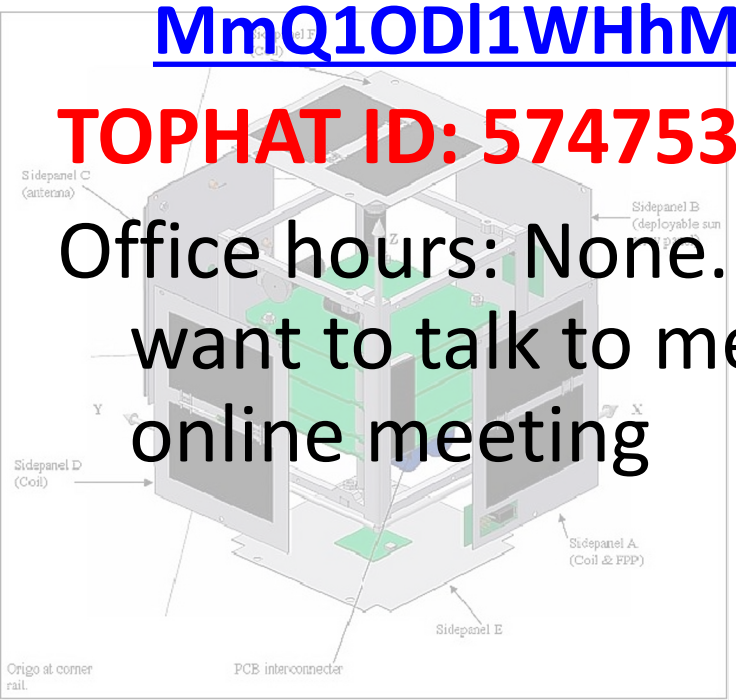


General Information

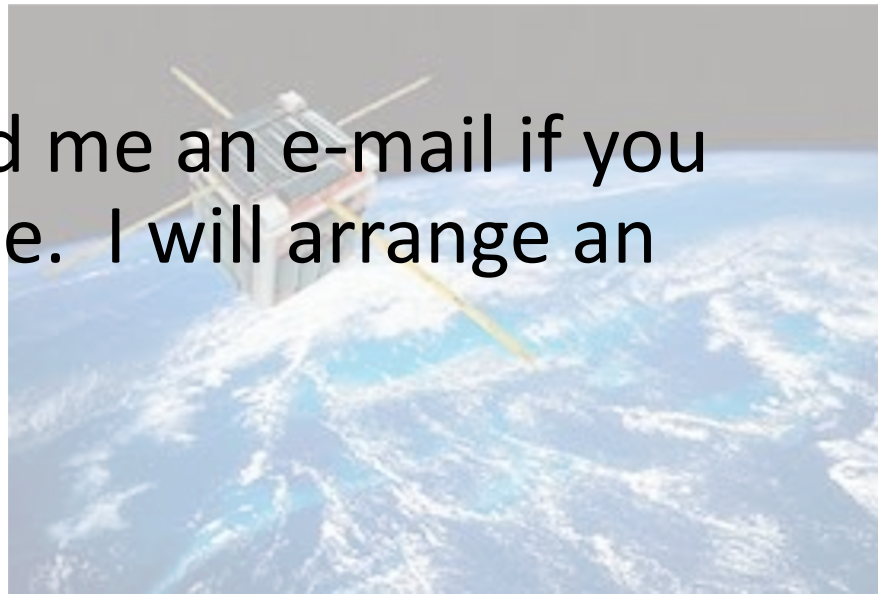
- **Lecture hours:**
  - **Tuesday 10:40-11:30 – FENS L030**
  - **Thursday 8:40 – 10:30 – FENSL062**

  https://sabanciuniv.zoom.us/j/92454311872?pwd=MmQ1ODl1WHhMRUVnbFd3K0M2aHZxdz09

TOPHAT ID: 574753



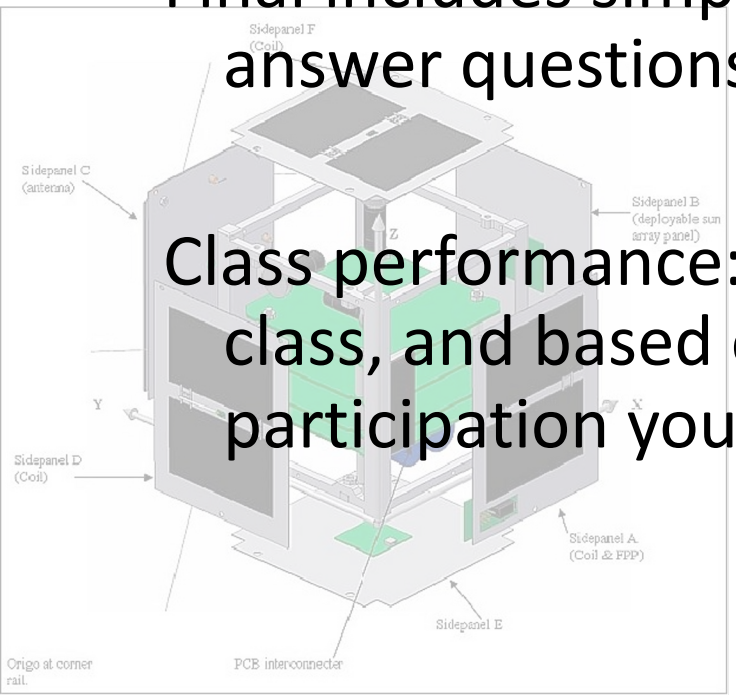
Office hours: None. Just send me an e-mail if you want to talk to me, anytime. I will arrange an online meeting



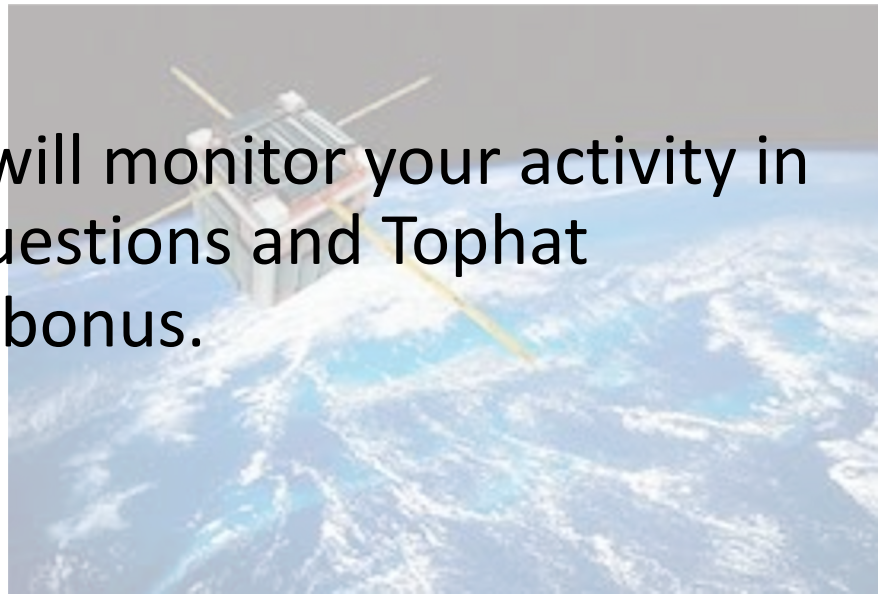
Grading

- Project : 60 pts
- Final : 30 pts
- Class + Tophat performance : 20 pts

Final includes simple problems from lectures, and short answer questions from the course material.



Class performance: I or a TA will monitor your activity in class, and based on your questions and Tophat participation you will get a bonus.

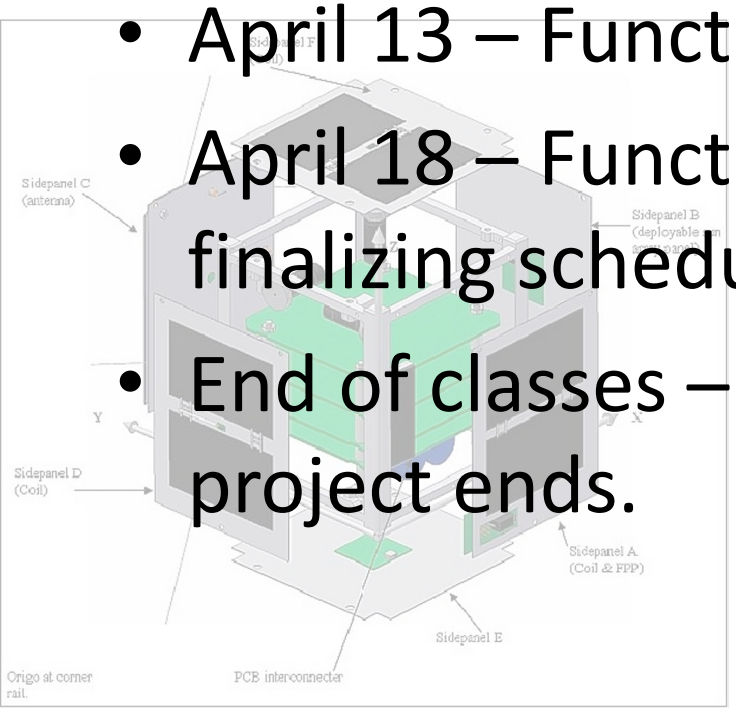


Project

- You will decide on a CubeSat project, or work on a project I suggest.
- You will design the CubeSat as a team. I will be your systems engineer/manager/PI.
- After determining the mission objectives and functional requirements, you will create the first version of the functional block diagram.
- You will produce engineering tasks related to the functional block diagram, and then create a Gannt Chart. I determine the milestones for timely execution of the project. Your schedule must fit into the milestones.
- Each of you will lead a specific task in the schedule. The project will be managed by a software called **dotproject**. Every time you work on the project, you will enter a log. I expect at least one log every week, if not more.
- Your project grade will be based on these logs, and your adherence to milestones and deadlines set in the project.
- Monday lectures (except the first 2) will be to discuss the progress in the project. **I WILL TAKE ATTENDANCE**. We will try to solve problems together and decide on trade-offs. If I feel that you have done enough on a task, I will stop it (as some tasks may require more experience and skills than you may have)
- The end-product should be a complete set of tasks that could in principle lead to an actual cubesat system, and a preliminary design review that discusses feasibility issues. While the aim is to understand how it is done, rather than actually doing it, some components you worked on may be part of the actual cubesat. **IF THE PROJECT is GOOD ENOUGH, WE WILL AIM for MI CONTEST!**

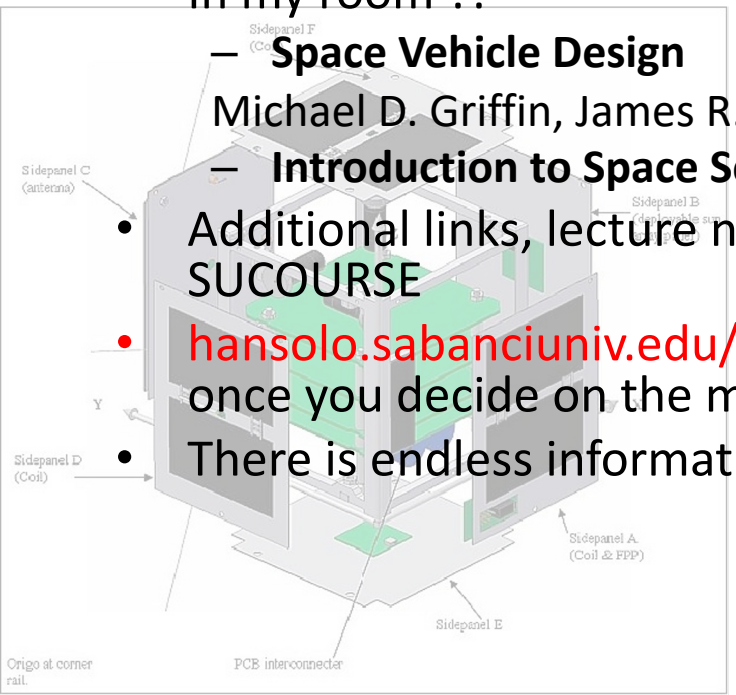
General Milestones

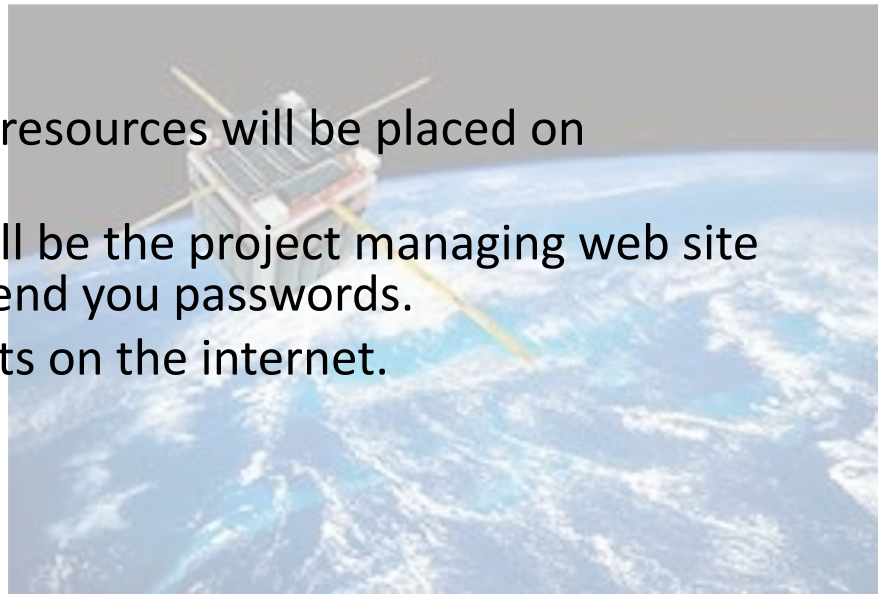
- March 16 - Brainstorming on cubesat idea
- March 23 – Cubesat idea finalized
- March 28 – Teams established
- April 13 – Functional Requirements
- April 18 – Functional block diagram and finalizing schedule and tasks.
- End of classes – Preliminary Design Review – project ends.



Resources

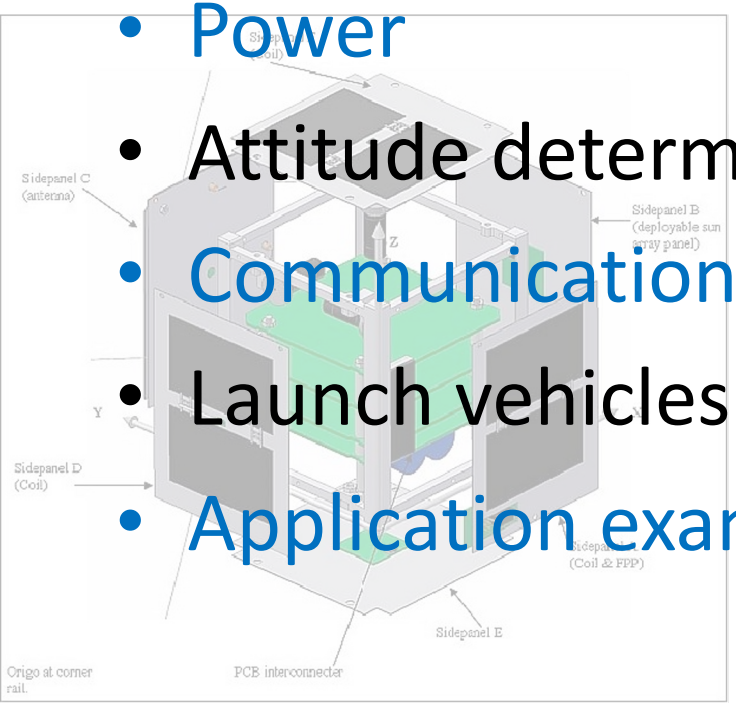
- Lecture notes will be placed on SUCOURSE, lecture videos will be shared
- Books on reserve:
  - **The Space Environment: Implications for Spacecraft Design**
    Alan C. Tribble
  - **Space Mission Analysis and Design, 3rd edition**
    Wiley J. Larson (Editor), James R. Wertz (Editor)
  - **Spacecraft Systems Engineering**
    Peter Fortescue (Editor), Graham Swinerd (Editor), John Stark (Editor)
- In my room ?:
  - **Space Vehicle Design**
    Michael D. Griffin, James R. French
  - **Introduction to Space Science**
- Additional links, lecture notes and web resources will be placed on SUCOURSE
- hansolo.sabanciuniv.edu/dotproject will be the project managing web site once you decide on the mission. I will send you passwords.
- There is endless information on Cubesats on the internet.





Lecture subjects

- Introduction to space system design
- Orbits
- Space and spacecraft environment
- Power
- Attitude determination and control
- Communications and telemetry
- Launch vehicles and orbital dynamics
- Application examples



TOPHAT and Class Participation

- Many of the lectures are already on record from 2020 spring. All lectures will be recorded. Some lectures will be ”flipped” as you will first watch the lecture and answer Tophat questions in class.
- **JOIN CODE: 574753**