**16.821 Flight Vehicle Development**

Phaeton

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Prof. Jon How

# Course Overview

- Follow-on to first term work
  - Complete systems development, systems integration

    → Finish systems testing

    → Flight tests
- Plan parallel effort on research projects by small groups
  - Projects that integrate back into the overall design
- Incorporate “lessons learned”
  - Students, faculty, staff

# Goals For This Term

- Complete project goals
- Professional experience in systems development, systems engineering, systems test
- Increased lateral communication between teams and team members
- Greater student role for planning and execution

# Spring Course Framework

- Combination of:
  - "16.62x-like" tasks and tests by sub-groups
    - 2-3 person teams, fast-moving tasks
    - ½ semester timeline
    - Progress documented in memos to teammates (~ every 3 weeks)
  - "Capstone-like" integrated tests and analyses
    - Combined efforts of multiple teams
- Common to both:
  - Pre-planning, documented procedures, post-test write-ups
    - Designed to be memos to other students
  - Post-test analysis memos of the four major tests will count towards the CIM grade.

# Class Meeting Format

- Thursday classes:
  - Individual student to be designated to brief top-level project status to project team, faculty, and staff
    - Technical summary briefing giving overall progress and plans
      - "Stop light" status - green, orange, red
      - Focus on major issues: possible impacts, resolutions, and overall schedule progress
    - 45 minutes max ➔ then discuss next steps
  - Lead role will be pre-assigned on rotating basis
  - Responsibilities of others: provide subsystem status internal coordination, assist as needed

- **Goal**: Increased "horizontal communication"

- **Note**: These shorter in class presentations do not count towards the CIM grade, but student participation/contributions to all class meetings will be graded (scale of 1 - 3)

# Class Meeting Format

- Tuesday class - focus on the sub-group projects
  - **Goal**: have sub-groups provide periodic information summaries to the overall team
    - Not a designated CI activity, but presentation should be clear
    - Technical summary briefing giving subsystem progress and plans
      - “Stop light” status - green, orange, red
      - Focus on major issues: possible impacts, resolutions, and overall schedule progress
  - 10-15 min for each sub-group

# Major Deliverables

- Lab notebook (~ every 2 weeks) [not CI]
- Subsystem memos (2-5 pages every 3 weeks) [CI]
  - group effort, with annotations to identify the author
- Test plans [not CI] and post-test reports [CI]
  - group effort, with annotations to identify the author
- Final oral presentation [CI]
  - Discuss flight results & overview of subsystems results
- Final report: Operating and software manual [CI]
  - group effort, with annotations to identify the author
- Flying prototype
  - All performance predictions verified/validated/documented

# Course Grade

- Course credit split: 25 % CI, 75% technical
- CI:
  - Sub-group memos (3): 40%
  - Final oral presentation: 20%
  - Reports (Post-analysis (4) and final): 40%
- Technical:
  - Notebooks: 20%
  - In-class participation: 20%
  - Sub-group memos (3): 20%
  - Final oral presentation: 15%
  - Reports (Post-analysis (4) and final): 25%

# Faculty and Staff Support

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|---|---|---|---|
| Prof Jon How | jhow@mit.edu | x3-3267 | 33-328 |
| Prof Mark Drela | drela@mit.edu | x3-0067 | 37-475 |
| Peter Young | pwyoung@mit.edu | x3-5340 | 33-240 |
| Jennifer Craig | jcraig@mit.edu | x2-3841 | 37-441 |
| Dave Robertson | droberts@mit.edu | x3-7216 | 33-017A |