

ENG EK131, M3, Introduction to Rocket Science
Professor Brian Walsh
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Fall 2019

Lecture: Mondays, 10:10am-11:55am

Office Hours: Thursday 10am-12pm or by appointment.

Description: As society becomes increasingly reliant on space-born assets, reliable rockets to deliver those assets safely to space are becoming more and more critical. Introduction to Rocket Science is a hands-on introduction to rocket dynamics and propulsion. The course will cover modeling tools to simulate the dynamics of rockets as well as different propulsion methods such as chemical, compressed gas, as well as electromagnetic propulsion. Areas of focus will include, mechanics, fluids, orbital dynamics, electronics, and manufacturing.

Website: The course website is on BlackBoard (learn.bu.edu). Electronic materials will be posted periodically throughout the semester, so check the website often for updates. **Note** that while grade assignments will be posted for your review, we do NOT use the Blackboard Grade Center to calculate semester grades. Ignore any interpretation of your grade based on whatever Blackboard-reported “points” that are displayed.

Required	Grade Fraction
Quizzes	25%
Project/Report	40%
In Class Participation	20%
Final Presentation	15%

Grades: All course grades will be posted to Blackboard. The final grade will be based on the grades from blackboard applied to the weighting above.

Due Dates: All projects reports and HW are due at the beginning of the designated lecture as a printed document. Reports handed in after the beginning of the class time will not be accepted and will receive a grade of zero.

Projects Reports: Project reports are designed to describe the experiment conducted. It should 1) briefly summarize the background of the experiment, 2) describe the experimental procedure conducted, and 3) present the results. If plots are included, they must follow “Brian’s Rules of Data Visualization” posted on blackboard. The length of a project report should be between 1.75 and 2.25 pages.

Accommodations for students with documented disabilities: If you are a student with a disability or believe you might have a disability that requires

accommodations, please contact the Office for Disability Services (ODS) at (617) 353-3658 to coordinate any reasonable accommodation requests. ODS is located at 19 Deerfield St, on the second floor. I will make every effort to accommodate such requests but (a) please notify me at the beginning of the semester if you've received approved accommodations in previous semesters (even if you haven't received your paperwork for this semester yet!) and (b) my policy is that I need at least one week's notification prior to each exam so we can make the necessary arrangements.

Ethical Responsibilities

Cheating on quizzes or project reports, or any form of assignment, may be a form of plagiarism and is an infringement of every code of engineering ethics. Plagiarism is a serious academic offense and should not be taken lightly. Understanding your ethical responsibilities is an integral part of becoming a professional. A copy of the Code of Ethics of engineers, promulgated by the Accreditation Board for Engineering and Technology (ABET) and the National Society of Professional Engineers, can be found on the main course web site.

Please recall that when you enrolled at Boston University, you agreed to an Academic Honesty Pledge. The Academic Conduct Code details your responsibilities as well as the results of code violations, and is posted at:

<https://www.bu.edu/academics/policies/academic-conduct-code/>

Schedule

Lec	Date	Topic	HW	
1	9 Sept	Timeline, human use of space.		
2	16 Sept	Mechanics I: Rocket equation		
3	23 Sept	Mechanics II: Orbits		
4	30 Sept	Chemical engines		Quiz 1
5	7 Oct	<i>Project 1 – Chemical thrust</i>		
6	15 Oct	Electromagnetic engines	Chemical thrust report	
7	21 Oct	Attitude dynamics I		Quiz 2
8	28 Oct	<i>Project 2 – Fin design</i>		
9	4 Nov	Attitude dynamics II	Fin design and manufacturing report	
10	11 Nov	Launch simulation I		Quiz 3
11	18 Nov	Launch simulation II	Launch model	
12	25 Nov	<i>Project 3 - Launch day</i>	Go/No Go study	
13	2 Dec	<i>Project 3 - Launch day – make up</i>		
14	9 Dec	Off - Teams work on final presentations	Launch results report	

Final group presentations will occur during the exam block.