

**Aerospace Propulsion**  
**MECH 5335 (CRN 17411)**  
**Course Syllabus**  
**Fall 2022**

**COURSE OBJECTIVES:** The goal of this course is to provide the student with a foundation in aerospace propulsion. The objectives are to develop the student's ability to:

- Understand basic principles of various air-breathing and rocket propulsion systems;
- Analyze the performance of aerospace propulsion systems and their components;
- Understand and apply main principles of propulsion system design.

**TIME:** TR 9:00 am – 10:20 am

**LOCATION:** LART 211

**INSTRUCTOR:** Dr. Evgeny Shafirovich

**E-MAIL:** [eshafirovich2@utep.edu](mailto:eshafirovich2@utep.edu)

**OFFICE:** A112

**OFFICE HOURS:** TR 11:00 am – 12:00 pm, 1:00 pm – 2:00 pm

**TEXTBOOK**

T.A. Ward, *Aerospace Propulsion Systems*, Wiley, 2010, ISBN 978-0-470-82497-9

**RECOMMENDED BOOKS**

S.D. Heister, W.E. Anderson, T.L. Pourpoint, and R.J. Cassady, *Rocket Propulsion*

P. Hill and C. Peterson, *Mechanics and Thermodynamics of Propulsion*, 2<sup>nd</sup> ed.

J.D. Mattingly and K.M. Boye, *Elements of Propulsion: Gas Turbines and Rockets*, 2<sup>nd</sup> ed.

G.P. Sutton and O. Biblarz, *Rocket Propulsion Elements*, 9<sup>th</sup> ed.

**BLACKBOARD:** Instructor will use Blackboard for uploading lectures, updating the syllabus (if necessary), and communicating with students via “Announcements” and email.

**EXAMINATIONS:** There are two exams. All exams are open book and open notes.

**DESIGN PROJECT:** The number of students in the project: two or three (or one under certain circumstances). Each project is a conceptual design of a specific aerospace propulsion system, selected by students and approved by the instructor. Students will meet with the instructor regularly to report their progress on the project and discuss further work. The final report (a Word document) is due at the end of the semester. Each project will be presented by students to class as two progress reports during the semester and final report at the end of the semester.

**GRADING:**

Exam 1	25%
Exam 2	25%
Design Project	50%

**COURSE CALENDAR**

<b>Week</b>	<b>Day</b>	<b>Date</b>	<b>Topic</b>	<b>Assigned Reading</b>
1	T	8/23	Introduction and fundamentals	1.1
1	R	8/25	Fundamentals	1.2 – 1.4
2	T	8/30	Fundamentals	1.5
2	R	9/1	Fundamentals	1.6 – 1.7
3	T	9/6	Fundamentals. Review of problems	
3	R	9/8	Review of problems. <b>Project topic assigned.</b>	
4	T	9/13	Rocket engines	2.1 – 2.2
4	R	9/15	Rocket engines	2.3
5	T	9/20	Rocket engines. Review of problems	2.4 – 2.9
5	R	9/22	Rocket engines	2.4 – 2.9
6	T	9/27	Rocket engines. Review of problems	2.10 – 2.11
6	R	9/29	Review	Chs. 1 and 2
7	T	10/4	<b>Project progress presentations 1</b>	
7	R	10/6	<b>Project progress presentations 1</b>	
8	T	10/11	<b>Exam 1</b>	<b>Chs. 1 and 2</b>
8	R	10/13	Review of Exam 1. Gas turbine engines	4.1 – 4.3
9	T	10/18	Gas turbine engines	4.4 – 4.5
9	R	10/20	Gas turbine engines. Review of problems	4.6
10	T	10/25	Gas turbine engines. Review of problems	4.7 – 4.8
10	R	10/27	Gas turbine engines	4.8 – 4.10
11	T	11/1	<b>Project progress presentations 2</b>	
11	R	11/3	<b>Project progress presentations 2</b>	
12	T	11/8	Ramjet engines	5.1 – 5.2
12	R	11/10	Ramjet engines. Review of problems	5.2 – 5.4
13	T	11/15	Review	Chs. 4 and 5
13	R	11/17	<b>Exam 2</b>	<b>Chs. 4 and 5</b>
14	T	11/22	Review of Exam 2	
14	R	11/24	<i>Thanksgiving Day</i>	
15	T	11/29	<b>Project final presentations. Final report is due.</b>	
15	R	12/1	<b>Project final presentations</b>	

No Final Exam

## **SCHOLASTIC INTEGRITY**

Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another as ones' own. Collusion involves collaborating with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. All suspected violations of academic integrity at The University of Texas at El Paso must be reported to the Office of Student Conduct and Conflict Resolution (OSCCR) for possible disciplinary action. To learn more, please visit [HOOP: Student Conduct and Discipline](#).

## **ACCOMODATIONS POLICY**

The University is committed to providing reasonable accommodations and auxiliary services to students, staff, faculty, job applicants, applicants for admissions, and other beneficiaries of University programs, services and activities with documented disabilities in order to provide them with equal opportunities to participate in programs, services, and activities in compliance with sections 503 and 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA) of 1990 and the Americans with Disabilities Act Amendments Act (ADAAA) of 2008. Reasonable accommodations will be made unless it is determined that doing so would cause undue hardship on the University. Students requesting an accommodation based on a disability must register with the [UTEP Center for Accommodations and Support Services](#) (CASS). Contact the Center for Accommodations and Support Services at 915-747-5148, or email them at [cass@utep.edu](mailto:cass@utep.edu), or apply for accommodations online via the [CASS portal](#).

## **COVID-19 PRECAUTIONS**

Please stay home if you have been diagnosed with COVID-19 or are experiencing COVID-19 symptoms. If you are feeling unwell, please let me know as soon as possible, so that we can work on appropriate accommodations. If you have tested positive for COVID-19, you are encouraged to report your results to [covidaction@utep.edu](mailto:covidaction@utep.edu), so that the Dean of Students Office can provide you with support and help with communication with your professors. The Student Health Center is equipped to provide COVID 19 testing.

The Center for Disease Control and Prevention recommends that people in areas of substantial or high COVID-19 transmission wear face masks when indoors in groups of people. The best way that Miners can take care of Miners is to get the vaccine. If you still need the vaccine, it is widely available in the El Paso area, and will be available at no charge on campus during the first week of classes. For more information about the current rates, testing, and vaccinations, please visit [epstrong.org](http://epstrong.org)