

Dr. Riggins
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AE 5535

Spring 2021

On-line/CANVAS (zoom classes)

Office hours: 12:30-2:00 pm Mon, Tue, Wed

Aerospace Propulsion Systems

THIS IS A NOTE-INTENSIVE COURSE! MUCH OF THE MATERIAL IS (DIRECTLY) GIVEN ONLY IN THE COURSE NOTES! (I.E. VIEW THE TEXTBOOK AS 'SUPPLEMENTARY' TO THE NOTES – BUT STILL REQUIRED).

NOTES FOR VARIOUS TOPICS COVERED IN THE COURSE WILL BE UPLOADED ON CANVAS AS PDF'S THROUGHOUT THE SEMESTER, PRIOR TO BEING COVERED IN CLASSES.

I APOLOGIZE IN ADVANCE FOR MY HANDWRITING!

YOU ARE RESPONSIBLE FOR ATTENDING CLASS AND TAKING ANY ADDITIONAL NOTES ON THE MATERIAL AS I GO THROUGH THE UPLOADED NOTES RELEVANT TO THAT MATERIAL.

Text: Aerothermodynamics of Gas Turbines and Rocket Propulsion: Gordon Oates
(**Recommended/not required**); mainly strong in jet engine analysis, light on rockets

Other good texts: Mechanics and Thermodynamics of Propulsion, Hill and Peterson (mainly rockets/jet engine components/ no jet engine off-design material covered)
(mainly jet engines, light on rockets)
Elements of Propulsion: Gas Turbines and Rockets; Mattingly (mainly strong in jet engine analysis, light on rockets)
Rocket Propulsion Elements: Sutton (only rockets)

Course Topics:

Non-Ideal Engines	Notes, Chapter 7
Engine Off-Design Performance and Component Matching	Notes; Chapter 8
Turbo-Machinery Aerodynamics	Notes; Chapter 9
Chemical Rockets	Chapter 3; handouts, notes
Non-Chemical Rockets and Space Missions	Chapter 3; handouts, notes
Turboprop Analysis	Chapter 7; notes
Power Generation in Space	handouts, notes
Ramjet/Scramjet Engine Design	handouts, notes

Innovative Hybrid & Combined-Cycle (Rocket-Airbreather) Aerospace Engines	handouts, notes
Rocket Nozzles/Aero-Spike and Plug Nozzle Analysis	handouts, notes
Introduction to Computational Fluid Dynamics	handouts, notes
Homework/Projects	60%
Test	20%
Final Exam	20%

COURSE PROCEDURE

As noted, CANVAS will be used to post instructor notes, prior to material being covered in class. You are responsible for downloading these notes (if you wish).

Homework:

- 1) All assignments will be uploaded to CANVAS and announced/described in class. Complete solutions to these assignments (see 'Regarding work submitted on CANVAS' below) will be collected as SINGLE pdf submissions on CANVAS (NOT EMAILED TO ME). Grading of homework will usually be done on CANVAS.
- 2) **LATE WORK OR EMAILED WORK WILL NOT BE ACCEPTED.**

Regarding work submitted on CANVAS:

Scanned work uploaded to CANVAS **MUST** be legible AND complete, when it is submitted. **An assignment submission MUST be a SINGLE pdf!** It is your own responsibility to make sure you have adequate technical knowledge/capability to produce pdf's of your work and to review your own work prior to submission. If portions of work are illegible or difficult to decipher, that material will not be considered as being properly submitted. (IF IT CANNOT BE READ, IT WILL NOT BE GRADED.)

When preparing work, make sure the writing is legible and neat, with clear formulation and good organization.

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Contact: equity@mst.edu (Equity and Title IX Office for Missouri S&T)