ASEN 5063
AIRCRAFT PROPULSION

Tuesdays and Thursdays 10:05 AM to 11:20 AM

Course Description:

This course is designed to teach the principles and practice of modern aircraft propulsion. It builds on the principles taught in ASEN 4013 (Fundamentals of Aerospace Propulsion). Gas turbine engines, principally turbofans, form an overwhelming fraction of modern aircraft engines. So the focus will be on turbofans, especially for commercial aircraft, although turboprops and military turbofans will also be considered-87 (be) -87red urs, aruthe cu

ines. After a brief overview of the Brayton cycle and a review of the principles of gas turbine engines, we will deal with analysis and design of various components: centrifugal and axial compressors, axial and radial flow turbines, inlets and nozzles, and burners. Compressor-turbine matching will be discussed, followed by analysis of off-design performance of gas turbine engines. Finally, environmental aspects of modern gas turbine engines, noise and emissions, will be dealt with.

We will be following an extensive set of notes I have prepared over the years. These notes will be made available on Canvas and will be supplemented by material from a recent textbook on *Aircraft Propulsion* by Farokhi, and a monograph on *Jet Propulsion* by Cumpsty, as needed.

Instructor:

Dr. Lakshmi Kantha
Professor
Department of Smead Aerospace Engineering Sciences
Office: Aerospace Building Room 463. Cell phone: 720-891-1775 (Please note that because of Covid-19 impact, I will be teaching from home. So it is best to e-mail me. Call me only if you need to contact me on an urgent matter).
E-mail: kantha@colorado.edu.

Office Hours: Tuesdays 3:00 PM to 5:00 PM

In addition, you can e-

Prerequisites: ASEN 4013 Undergraduate Course on Propulsion or Instructor's consent

Grading: Homework (8) – 40%, Quizzes (5) – 10%, Mid-Term Exam (1) – 20%, Final Project (or Exam) – 30%

Course Outline:

1. Introd

Campus-mandated Syllabus Statements

Classroom Behavior

Both students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote or online. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. For more information, see the policies on classroom behavior and the Student Code of Conduct.

Requirements for COVID-19

In this class, if you are sick or quarantined, please let me know about your absence by e-mail. Because of FERPA student privacy laws, students are not required to state the nature of their illness when alerting me.

Accommodation for Disabilities

If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the Disability Services website. Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance. If you have a temporary medical condition, see Temporary Medical Conditions on the Disability Services website.

Preferred Student Names and Pronouns

CU Boulder recognizes that students' legal information doesn't always align with how they identify. Students may update their preferred names and pronouns via the student portal; those preferred names and pronouns are listed on
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