UNIVERSITY OF CENTRAL FLORIDA
Mechanical & Aerospace Engineering

EAS 4300 Aerothermodynamics of Propulsion Systems
Spring 2013

Instructor: Dr. Subith Vasu
Office: Engr 1, 216
Email: subith@ucf.edu (preferred contact method)
Office hours: 2.45-5.30 PM Tuesdays

Description: Fundamental analysis and design considerations of propulsion systems. Turbojets, ramjets, and rockets.

Goals: To familiarize the student with the methods for analysis and design of both air-breathing and rocket propulsion systems.

Units: 3

Prerequisite EAS 4134 High-speed Aerodynamics
Thermodynamics, compressible flow, aerodynamics, fluids

Lecture Times: Tu & Th 1:30-2.45 pm **Room:** Class Room 1, 320

Required Texts: Phillip Hill & Carl Peterson, "Mechanics and Thermodynamics of Propulsion," 2nd ed., Addison Wesley, 1992.
Additional notes will be distributed.

References: John & Keith, Gasdynamics, 3rd Edn
Cengel & Boles, Theromodynamics, 7th Edn
Other reference materials will be mentioned during lectures.

Grading: General guideline is:
≥ 90: A 80-89: B 70-79: C 60-69: D 0-59: F
Grade curving, Pluses and minuses, and any other changes to the grading policies will be at the discretion of the instructor.

2 Exams	20% each, Feb 19 & March 19
HW & project	20%, due on Tuesdays
Final Exam	40%, April 30, 1-3:50 PM

TA/Grader Fuad Ismayilo, fuad_ism@knights.ucf.edu

Exams:
The Exams may include conceptual questions and numerical calculations. Any cheating in exams, in any form, will result in an automatic F for semester grade. Medical emergencies will be accepted for absence in exams only with a supporting letter from your physician. No make-up exams will be given for midterms, but final exam score will be scaled accordingly.

Homework:
Homework is an important part of the learning process. Homework problems will be assigned and solutions will be posted. Homework problems are the best way to apply your concepts. ***Note that mastering homework problems may help performance in exams.*** HW will normally be assigned on Tuesdays and due the following Tuesday in class. Late homework will not be graded. Instructor may choose not to grade all homework problems.

Course Outline
The topics covered during this course are as follows.

1. Fundamentals
    - Jet propulsion principles
    - Mechanics and thermodynamics of fluid flow
    - Steady 1-D flow of perfect gases
    - Boundary layer mechanics and heat transfer
2. Air breathing engines
    - Thermodynamics of aircraft jet engines
    - Inlets
    - Combustors
    - Nozzles
    - Axial compressors
    - Axial turbines
    - Centrifugal compressors
3. Rockets
    - Rocket performance
    - Chemical rockets
    - Electric rockets