EAS 4132/EML5714: Compressible Flow/Intro to Compressible Flow Syllabus -- Fall 2025

(Modifications to this syllabus may be required during the semester. Any changes to the syllabus will be posted on the course web site and announced in class.)

1. **Catalog Description**: One-dimensional and quasi one-dimensional compressible fluid flows. Includes Mach waves, normal shocks, oblique shocks, Prandtl-Meyer expansions, isentropic flow with area change, Fanno flow and Rayleigh flow. Credits: 3

2. **Pre-requisites**: *EAS 4101 and EGN 3353C.*

3. **Course Objectives:** This course provides an introduction level coverage of compressible flow. At the end of this course, the student will be able to analyze one-dimensional and quasi-one-dimensional compressible flows and to study phenomena including Mach waves, normal shocks, oblique shocks, Prandtl-Meyer expansions, isentropic flow with area change, Fanno flow and Rayleigh flow.

4. **Contribution of course to meeting the professional component**: This course is designed primarily for students of mechanical and aerospace disciplines. The course content is 100% engineering science.

5. **Student Outcomes (for ABET purposes):** 1 - H, 3 – L (H-Strong support, L-Minimal support)

6. **Instructor:**
   Corin Segal.
   Office location: 437 NEB
   Telephone: 392-6132
   Web site: http://elearning.ufl.edu (e-learning in canvas system)
   Office hours: MWF 1:30 – 2:30 pm

   E-mail is an inefficient means of communication for our purpose; therefore, we shall not use it.

7. **Meeting Times and Location:**
   - MWF 9 Period (4:05 – 4:55) in NEB 100.

8. **Textbooks Required**: *Gas Dynamics* by John and Keith, Prentice Hall; 3rd Edition.
   Notes: 1. This text book is required; other editions may not have the same problems on the same pages, therefore, cannot be used as substitutes.
   2. NACA Report 1135. It contains the shock wave functions required to solve compressible flow problems. It will be required every time we solve compressible flow problems. It can be downloaded free at:
   https://www.grc.nasa.gov/www/k-12/airplane/Images/naca1135.pdf

9. **Course Outline**:
   - Basic Equations of Compressible Flow (Chapter 1)
   - Wave Propagation, Isentropic Flow, Normal and Oblique Shocks, Expansion Waves (Chapters 2-7)
   - Applications involving Shocks and Expansion Waves (Chapter 8)
   - Fanno flow (Chapter 9)
   - Rayleigh flow (Chapter 10)
   - Special topic: Characteristics (Chapter 14)

10. **Attendance and Expectations**: Lecture attendance is imperative. Although attendance will not be taken or used in assigning grades, students will be held responsible for knowing all changes made to scheduling and all class announcements.

Note: although information will be posted on the website, class announcement prevails in case there are discrepancies.

11. **Assessment Methods and Grading**:
    a. Homework will be assigned periodically during the semester. Homework will not be graded. Selected solutions will be posted online. PLEASE REGARD THE ASSIGNED HOMEWORK AS MINIMUM NECESSARY TO PREPARE YOU FOR EXAMINATION. ADDITIONAL PROBLEMS FROM THE BOOK OR OTHER SOURCES ARE RECOMMENDED.

    Please submit your solutions ONLY via Canvas. Late assignments will not be accepted. The lowest grade for the HW problems will be dropped.

    b. There will be three exams during the semester in class. Exams will emphasize the most recently covered material. The exams will take place during the regular class period. Exam dates are listed below:

    Exam dates: Exam 1: September 26
    Exam 2: October 29
    Exam 3: November 19

    If a student feels that there is an error in the grading, please bring it to the instructor attention within a week after the graded material is handed back. Scores will not be reconsidered beyond the one-week period. The relative weighting of the HW Problems and Exams in the final grade will be:

    a. HW average 25%
    b. Exams average 75%

12. **Grading Scale**:

93 – 100: A	87 – 89.9: B+	77 – 79.9: C+	60 – 69.9: D	0 – 59.9: E
90 – 92.9: A-	83 – 86.9: B	73 – 76.9: C		
	80 – 82.9: B-	70 – 72.9: C-		

13. **Honesty Policy and Ethical Considerations**: All students admitted to the University of Florida have signed a statement of academic honesty committing to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.

14. **Accommodation for Students with Disabilities:** Students requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

15. **UF Counseling Services**: Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:
    - UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.
    - Career Resource Center, Reitz Union, 392-1601, career and job search services.

    If I can help at any time let me know.

16. **Software Use**: All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

17. **In-Class Recording:**
    Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil

proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session. Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.