SYLLABUS

BASIC FLUID MECHANICS
20-AEEM-383-001
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Time: Monday, Wednesday and Friday, 3:00PM-3:50PM
Room: 757 Baldwin
Notes: Available online at http://gtsl.ase.uc.edu/BFM
Grading: 25% Homework and Quizzes NO MAKEUP QUIZZES
25% Exam 1
25% Exam 2
25% Final Exam (Wednesday June 9, 2:15-4:15PM)
90-100 A range, 80-89 B range, 70-79 C range, 60-69 D range, 59 and below F
Office Hour: Wednesday 1:00-2:00PM
By Appointment
TA: TBD
Policies: Late Homework - Not accepted without excuse prior to deadline.
Missed Tests - Zero grade without excuse prior to test date.

Outline

● Introduction, Fluid Properties
● Hydrostatics
● Conservation of Mass and Newton’s Second Law
● Bernoulli Equation
● Similitude
● Viscous Flow

Homework Due Date Schedule

1. 4/2 Basic Properties/Shear
2. 4/9 Standard Atmosphere
3. 4/16 Hydrostatics
4. 4/28 Conservation of Mass
5. 5/12 Momentum Equation/Newton’s Second Law
6. 5/21 Bernoulli Equation
7. 6/2 Similitude/Viscous Flow
Goals

1. Understand the concept of a fluid, related properties and definitions.
2. Understand streamlines and be able to compute them from given velocity field information.
3. Understand and be able to derive the governing equations for inviscid incompressible flows.
4. Understand the conservation principles.
5. Understand and be able to apply the concepts of hydrostatics.
6. Understand and be able to apply Newton’s second law to fluid mechanics problems.
7. Understand, be able to derive, and be able to apply the various forms of the Bernoulli equation.
8. Understand and be able to apply the Buckingham Pi Theorem and related similitude ideas.
9. Understand and be able to apply the concepts related to viscous fluids.

Expectations of Students

1. Attend each class.
2. Read ahead in text and notes.
3. Read and correct notes.
4. Do worked problems in a timely manner.
5. Complete assignments on time or early.
6. Present professional quality assignments.
7. Ask/answer questions raised in class.
8. Contribute to the classroom discussion.
9. Be prepared to work problems on the board.
10. Seek out additional study material from external sources (library, etc.).
11. Interact with other students.
12. Consult other information sources (library, Schaum’s outline).

Assignment Preparation Rules

1. Regurgitate the problem.
2. Include a drawing (when appropriate).
3. Do not economize on paper at the expense of clarity. Work downwards or indicate direction.
4. State all assumptions!