Haroon Stephen, Engineering, UNLV

My teaching goal is to encourage a passion to learn in my students by engaging them through in-class demonstrations and lively discussions. I have progressed towards my teaching goal through various efforts of curriculum development and use of innovative methods in teaching and learning. I have succeeded in facilitating student learning by defining clear course objectives, creating an effective course plan, and evaluating student learning as well as my own teaching through effective assessment tools. I have succeeded in improving student learning using in-class demonstrative experiments, cyber-based contents delivery, and utilizing social media. I am passionate about teaching through hands-on training and have developed many apparatuses to teach engineering principles. Moreover, I have created many video tutorials to elaborate on the course material. These videos are posted on YouTube (Rebels Cybergogy Channel) and links are available on WebCampus and class websites. I have created Facebook pages for my classes which provide a platform for students to interact with each other outside the classroom. Facebook pages are used as a forum for open discussions. Selected evidence of my curriculum development efforts is provided in the following pages.

Three Representative Pages of Example Syllabus

CEE 367 Fluid Mechanics

Syllabus Fall 2015

Time: 8:30 AM – 9:45 AM T/R
Room: TBE B174

Coreqs: CEE 367L
Prereq: ME 242 and MATH 283

Instructor: Dr. Haroon Stephen ▤: SEB 3247, ☎: 774-1463, ✉: haroon.stephen@unlv.edu
🖱: http://faculty.unlv.edu/wpmu/hstephen/

Office Hours: MTWRF 3:00 pm – 4:00 pm or by appointment

TA: Roshan Poudel ▤: SEB 3248, ☎: 774-1413, ✉: pouder1@unlv.nevada.edu
Office Hours: MWF 11:00 am – 12:00 pm or by appointment

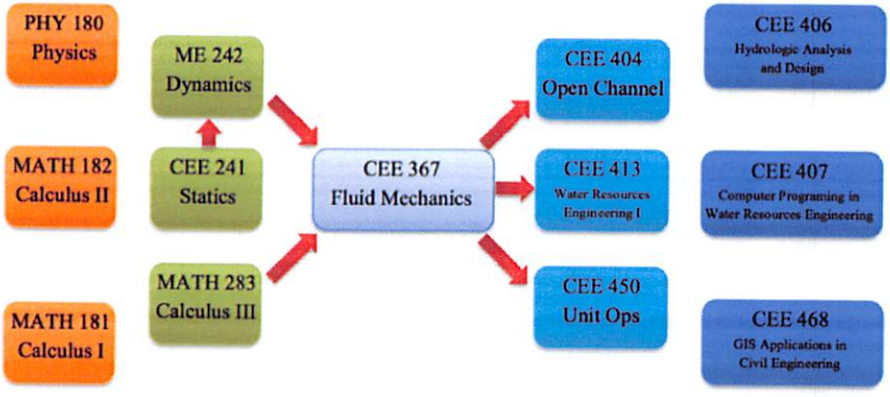
Grader: Kazi Tamaddun ▤: SEB 4215, ☎: 774-1415, ✉: tamaddun@unlv.nevada.edu
Office Hours: MW 11:00 am – 12:00 pm or by appointment

Textbook

Fundamentals of Fluid Mechanics 7th edition by Munson, Okiishi, Huebsch, and Rothmayer
John Wiley & Sons Inc., ISBN: 978-1-11811613-5

Course Overview

Fluid mechanics course provides an understanding and experience about *fluids and their behavior* under various physical conditions. It builds upon knowledge learned in prerequisite courses and prepares for many more advanced courses as depicted in the flowchart below.



The course starts by introducing fluid properties and how fluids behave at rest (fluid statics). Then the course gets into the development of fundamental equations that govern flow or fluids in motion (fluid dynamics). Later, the fundamental equations of fluid statics and dynamics will be applied to study fluid motion inside pipes and channels (internal flow), around solid submerged objects such as submarine and airplane wings (external flow). The course will also teach about pumps and turbines (turbomachinery) and how to use models (dimensional analysis and similitude) to learn about hydraulic behavior. Throughout the course, you will also learn about instruments and structures used for measurements in fluid mechanics. In the co-requisite lab exercise, you will gain hands-on experience about several of the above-mentioned concepts.

Course Objectives

In particular, the successful students will be able to

1. Describe the various fluid properties and their units and how they vary with temperature and pressure.
2. Calculate pressure of any fluid at rest and its force on plane surfaces.
3. Compute buoyant force on a rigid body placed in a fluid and determine its stability.
4. Apply governing equations of fluid flow (Bernoulli, continuity, energy, and momentum equations) to solve engineering problems.
5. Classify fluid flow as steady or unsteady; uniform or non-uniform; viscous or inviscid; laminar or turbulent; subcritical or supercritical; compressible or incompressible; and internal or external flow.
6. Calculate pressure drop due to friction in any pipe network for laminar and turbulent flow
7. Compute discharge in an open channel using Manning's equation
8. Estimate drag and lift forces on moving objects submerged in a fluid and define cavitation
9. Determine a functional relationship between dimensionless terms of a physical model using Buckingham π-method.
10. Determine dynamic characteristics of a prototype from a model using similarity analysis
11. Identify instruments and structures used to measure fluid properties and fluid flow characteristics.

Learning Activities

In-class lessons with active learning exercises: Every lesson includes active learning activities and exercises. Lessons often deal with additional material not discussed in the textbook. **Attending the class and punctuality is required.** There will be no makeup classes.

Assignment problems covering all course modules: Homework assignments will be due at the beginning of class on due dates. Late assignment grade will be reduced by 5% for every day of delay. Neatness, organization, and correct answer are essential parts of a good solution. Please, use "*Engineering Graphing Paper*", and box in your answers. Students are encouraged to form homework-study groups but each student must turn in their own solution and show their own work and effort. This class has zero tolerance to plagiarism. **Students missing more than 2 assignments will receive incomplete (I) on their final grade.**

Quizzes: Announced and pop quizzes are designed to assess student learning. There is no makeup for quizzes. Quizzes will usually involve a problem or a concept related to the material covered on the last homework assignment. You have to attend class to receive credit. **Working on homework assignments will prepare you for quiz problems.**

Examinations: All examinations will be given through webcampus. Guidelines will be provided during in-class review sessions. **Final exam will be comprehensive.** You are responsible to know and understand all material presented in the course. In case of scheduling conflict, please notify in advance for special accommodation.

Laboratory exercises (CEE 367L): The lab work is 25% of the overall grade in CEE 367. **Students missing any lab or showing unsatisfactory performance in the lab will receive fail (F) on their final grade.** Your laboratory grade will be based on the lab activities i.e., conducting the experiment, making needed observations, and preparing the lab report.

Suggested Strategy:

This course has been planned so that you can build up your grade step-by-step with the homework assignments and quizzes. Thus, every homework is important because it contributes to your grade and prepares you for the quizzes and exams. Do not wait until the last minute to clarify things. ASK QUESTIONS IN CLASS! Take advantage of the office hours.

Grading

Final grade will be determined from total score, which will be calculated from the following class activities weighted by percentages as below.

Assignments	10%	Missing 2 assignments gets **Incomplete (I)** on final grade
Quizzes	10%	
Midterm Exam 1	15%	
Midterm Exam 2	15%	
Final Exam	25%	
Laboratory	25%	Failing CEE 367L gets **Fail (F)** on final overall grade
Total	100 %	

The A B C D F plus/minus system will be used for grading and the ranges are as follows.

Score ≥ 94%	A	73% ≤ Score < 77%	C
90% ≤ Score < 94%	A-	70% ≤ Score < 73%	C-
87% ≤ Score < 90%	B+	67% ≤ Score < 70%	D+
83% ≤ Score < 87%	B	63% ≤ Score < 67%	D
80% ≤ Score < 83%	B-	60% ≤ Score < 63%	D-
77% ≤ Score < 80%	C+	Score < 60%	F

Course Schedule, Learning Objectives, and Important Dates

Week 1	**Chapter 1 - Introduction** **08/25 - Lesson #1: Fundamentals** ☐ Define fluid and fluid mechanics ☐ Differentiate dimensions and units ☐ Convert dimensions between M-L-T and F-L-T systems ☐ Convert units between SI, BG, and EE systems ☐ Define pressure and convert between gage- and absolute-pressure ☐ Determine properties of standard atmosphere at various elevations **08/27 - Lesson #2: Fluid Properties** ☐ Define and calculate specific weight and specific gravity ☐ Define viscosity and relate it to shear stress and fluid deformation ☐ Define compressibility and calculate speed of sound in fluids and gases ☐ Define surface tension and calculate it from capillary rise ☐ Define vapor pressure and relate it to boiling point of a fluid ☐ Determine fluid properties of water, air, other common fluids HW-1 due on 09/03/2015
Week 2	**Chapter 2 - Fluid Statics** **09/01 - Lesson #3: Pressure and Force of Fluid at Rest** ☐ Define fluid statics and identify forces in a fluid at rest ☐ Define Pascal's Law of fluid pressure ☐ Calculate pressure in a fluid at a given depth ☐ Determine fluid pressure in a pipe or a container using a manometer

Note: Table is truncated but follows the same theme for the remaining weeks of the semester.