

ENVE 4820 Hydraulic Engineering, Spring Semester 2018
Dept. of Civil and Environmental Engineering
University of Connecticut

Instructor: Visiting Professor William Clarkson, Ph.D., P.E. (ret.)
Office: Castleman Room 203
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Lecture Time/Place: MWF 10:10-11:00, Castleman 201

Text: *Hydraulic Engineering*, 2nd edition, by Roberson, Cassidy, and Chaudhry
John Wiley and Sons, ISBN 0-471-12466-4

Ref: *Fundamentals of Fluid Mechanics*, 7th edition, by Munson, Okiishi, Huebsch, and Rothmeyer
John Wiley and Sons, ISBN 978-1-11811613-5...or...

Munson, Young, and Okiishi's *Fundamentals of Fluid Mechanics*, 8th edition, by Gerhart *et al.*
John Wiley and Sons, ISBN 978-1-118-84713-8

Plus handouts and other material (posted on HuskyCT)

Office Hours: MWF by appointment or anytime via e-mail

Course Objectives: To acquire fundamental knowledge and computational skills relating to the design and analysis of open channels, water and wastewater conveyance systems, turbomachinery, and associated hydraulic structures. Research and report on topics of interest related to the course.

Grading:	Two Exams @ 25%	50%
	Design Project Presentation and Report	25%
	<u>Homework and Lab Experiments</u>	<u>25%</u>
	TOTAL	100%

Homework will be collected and graded. Due dates will be enforced for full credit. Late homework will be accepted up to one class period past due date for up to 75% of full credit unless other arrangements are made. Class attendance and cooperative work on labs (as assigned) and projects will be expected of all students.

Final Grade Scale:	A+	doesn't exist	A	92 and above	A-	89
	B+	86	B	82	B-	79
	C+	76	C	72	C-	69
	D+	66	D	62	D-	59
	F	58.49 and below				

This grade scale is guaranteed. The instructor reserves the right to bump students up to the next-higher grade when deemed appropriate (as determined by the instructor). PLEASE NOTE: There will be no extra assignments to make up students' perceived grade deficiencies, and the instructor does not respond favorably to whining and begging (a.k.a. "grade grubbing" or "brown nosing").

Tentative Course Schedule:

<u>Week:Dates</u>	<u>Topics</u>	<u>Text References*</u>
1 : 1/17-19	Course Introduction / Begin Open Channel Flow (review)	HE Ch.1/4.1 FM Ch. 10
2 : 1/22-26	Steady Open Channel Flow	HE Ch. 4.2 FM Ch. 10.1, 10.4
3 : 1/29-2/2	Open Channel Flow Measurement / Weirs, Parshall Flumes, etc.	HE Ch. 4.4 FM Ch. 10.6
4 : 2/5-9	Gradually Varied Flow and Downstream Effects	HE Ch. 4.3 FM Ch. 10.2, 10.5
5 : 2/12-16	Rapidly Varied Flow / Hydraulic Jump and Energy Dissipation	HE Ch. 4.3 FM Ch. 10.3, 10.6
6 : 2/19-23	Hydraulic Structures	HE Ch. 7
7 : 2/26-3/2	EXAM 1 / Discuss Potential Project Topics and Assign Design Groups**	
8 : 3/5-9	Review Basic Confined (Pipe) Flow / Measurement	HE Ch. 5.1-3 FM Ch. 8
9 : 3/12-16	SPRING BREAK	
10 : 3/19-23	Appurtenances / Water Hammer and Surge Protection	HE Ch. 11
11 : 3/26-30	Dimensional Analysis, Similitude, and Model Studies	HE Ch. 7.7 FM Ch. 7
12 : 4/2-6	Turbomachinery (Pumps and Turbines) / Pump Types and Selection / Pump Curves and Efficiency	HE Ch. 8 FM Ch. 12
13 : 4/9-13	Branching Pipes and Pipe Systems / Flow Balancing and Network Analysis	HE Ch. 5.5 FM Ch. 8.5
14 : 4/16-20	EXAM 2 / Design Project Work or Makeup Class Sessions	
15 : 4/23-27	PROJECT PRESENTATIONS	
16 : (date TBD)	EXAM WEEK / Project Reports Due (No Final Exam - alternate date for EXAM 2)	

* HE = *Hydraulic Engineering* by Roberson *et al.*

FM = *Fundamentals of Fluid Mechanics* by Munson *et al.*

Other sources will be identified, posted to HuskyCT, and/or handed out in class.

Labs may be scheduled at various times and will be counted as part of the homework course component.

**** Group Design Projects** will be chosen from among topics that will supplement the in-class coverage of hydraulic engineering. The class will be split into design teams who will research and prepare presentations and written reports on a topic of their choosing from among a list of potential projects that will be handed out at the time of the assignment.

Homework Format:

- always use engineering paper
- reasonable spacing and readability of problem solutions
- name on each page
- staple pages together and turn in flat (not folded)

Exam Policies:

- open notes (including review sheets prepared by students for the exam)
- any information required from textbook or other sources will be provided
- all work to be graded will be submitted on the exam papers, using backs of pages if necessary
- evidence of collaboration on exams will result in a failing grade