University of Cincinnati

Department of Civil and Environmental Engineering
20 CEE 493 Hydraulic Systems

Spring Quarter 2007
TR 11:00 AM – 12:15 PM
643 Baldwin

Prof. Dominic Boccelli
742 ERC
556-2770

Lecture and Reading Schedule

Date–Class	Day	Brief Outline of Topics	Textbook Readings
Mar 27	1	Course Outline, Concept Hieracrchy	1 & 2
Mar 29	2	Pipe flow, Reynolds Number,	3.1–3.4
		Forces and Energy Head in Pipe Flow	
Apr 3	3	Loss of head due to friction, Laminar Flow	3.5
Apr 5	4	Loss of head due to turbulent flow, Moody Diagram	3.5–3.6
Apr 10	5	Minor losses	3.7–3.10
Apr 12	6	Pipelines connecting two reservoirs, Series and parallel flow	4.1–4.2
Apr 17	7	Pipe Networks	4.4
Apr 19	8	Measurements of Fluid Property and Phenomena	9.1–9.2
Apr 24	9	Discharge Measurements	9.3–9.4
Apr 26	10	Classification of open channel flow,	6.1–6.3
		Uniform flow in open channels	
May 1	11	**MID-TERM EXAM**	
May 3	12	Energy Principles in Open Channel Flow	6.4
May 8	13	Hydraulic Jump	6.5
May 10	14	Gradually Varied Flow, Classifications	6.6–6.7
May 15	15	Computation of water surface profiles	6.8
May 17	16	Dimensional Homogeneity, Principles of Hydraulic Similitude	10.1–10.2
May 22	17	Reynolds Number, Froude Number, Pi Theorem	10.3, 10.4
		Open Channel Models	10.8, 10.9
May 24	18	Water Pump	5.1–5.2
May 29	19	Similarity Laws and Dimensional Analysis Selection of a Pump,	5.4–5.5
		Pumps in Series and Parallel	
May 31	20	Overflow, Review	
		FINAL EXAM	

Description: This course provides an overview of fundamental topics in engineering hydraulics. It builds on the concepts and material learned in Fluid Mechanics to provide a broad coverage of topics ranging from pipe flows to open channel flow and design. This course is intended to bridge the gap between fundamental understanding of basic fluid principles and hydraulic engineering design.

Lectures: Lectures will meet Tuesdays and Thursdays at 11:00 AM in 643 Baldwin Hall. We will closely follow the textbook and other reference material as outlined in the schedule above. The course content is defined by the material presented in lectures, so regular attendance is advisable.

The scheduled office hours will be between 1:00 PM and 2:00 PM on Monday and Wednesday [subject to change] or by appointment.

Text: Fundamentals of Hydraulic Engineering Systems, Hwang and Houghtalen, 3^{rd} ed.

References: Fluid Mechanics with Engineering Applications, Franzini and Finnemore, 9^{th} ed. [on reserve at Engineering Library; TA357.F73 1997]

Homework: Problem sets will be distributed throughout the quarter. There will be a total of six to eight problem sets. Problem sets will be due one to one-and-a-half weeks after being distributed. The solution sets will be kept in reserve in the Engineering Library and/or provided electronically.

Exams: There will be a mid-term and a final exam. The final exam will cover the entire course material. During the exams, you may bring in a one page (letter size) summary [subject to change].

Grades: Class attendance and participation (5%), Homework (25%), Mid-Term (30%), Final Exam (40%)