CE 361 WATER RESOURCES ENGINEERING
Tu-Th 11:15a-12:30p in 207S Henderson-South

INSTRUCTOR: Dr. Patrick Reed
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OFFICE HOURS: Dr. Reed's---TU 3-5pm, TH 8-10am, or by appointment
Lauren Webber (Teaching Intern)---Evening help session(s) TBA.

REQUIRED TEXT:

GRADING:		
	Participation	10%
	Homework	40%
	Bi-Weekly Quizzes	50%

Letter grades will be based on the weighted average specified above and assigned as follows:

- A = 94-100%
- A- = 90-93%
- B+ = 87-89%
- B = 84-86%
- B- = 80-83%
- C+ = 76-79%
- C = 70-75%
- D = 60-69%
- F < 60%

I reserve the right to adjust your grades. Your grade will only improve if adjustments are necessary. Feel free to contact me during office hours or by appointment if you have grade-related questions or concerns.

COURSE DESCRIPTION:

This course offers a quantitative introduction to water resources engineering based on a sound background in fluid mechanics applied to understanding hydrologic and hydraulic processes. Hydrologic processes include rainfall, evapotranspiration, infiltration, groundwater flow, surface runoff and routing. This knowledge is applied to the analysis of the natural water-cycle, mass transport, man-made water systems including flood and stormwater control, reservoirs, risk/reliability analysis and investigations into hydrologic extremes (floods and droughts).

IN CLASS PARTICIPATION:

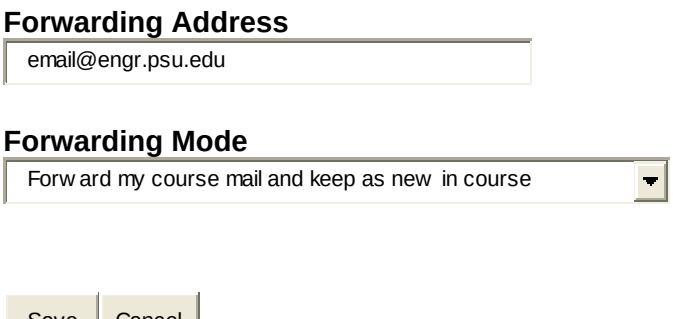
Please bring your text, a calculator, and scrap paper to each class. You will be participating in the solution and discussion of in-class example problems. You will work in small groups while solving these problems. Each group will hand in their attempt to solve the problem with each member's signature on the paper. Simply attempting the solution will result in full participation credit for the day. These in-class exercises will require that you **complete the assigned readings** prior to the beginning of each class.

ON-LINE CLASS PARTICIPATION:

All course emails and web postings will be made using the ANGEL course management software. You will need to regularly login (**https://cms.psu.edu/frameIndex.htm**) to check course announcements, download in-class example solutions, and access posted homework solutions.

Important: When you 1st login into the system you must configure "My Settings" to forward course emails to your primary email account as follows:

Step 1: Login into system
Step 2: Click "My Settings"
Step 3: Click "System Settings"
Step 4: Type your PSU Email under "Forwarding Address" and set "Forwarding Mode" as shown below:



Step 5: Click "Save". You now should receive all course announcements in your primary email account as well as your ANGEL account.

HOMEWORK:

Homework will be assigned bi-weekly and is due at the **beginning of class** on the Thursday of the subsequent week. Late homework **will not** be accepted. Feel free to work on the assignments in groups of 2 or 3. If you are doing group work, hand in 1 copy with everyone's name.

Each assignment requires:

- Your name(s) on each page of **stapled** solutions
- A legible step-by-step presentation (**in pencil**) of the solutions (**include problem diagrams**)
- Boxed answers presented in proper units

Solutions will be made available after your assignments have been collected.

QUIZZES:

This class has no exams. Bi-weekly quizzes will be used to assess your understanding of the course material. Make up quizzes will not be given. In extreme cases, a quiz grade will be replaced by the average of your grades on the remaining quizzes (proof of illness or emergency will be required).

EXTRA CREDIT:

This course introduces you to the importance of water resources engineering. I will increase your score on each homework assignment by 10%, if you find examples in newspapers, magazines, or the internet of real-world problems where the topics covered in this course play a vital role. Submit a 1-paragraph (<300 words), well written synopsis that provides:

- A summary of the problem (in your own words)
- A brief discussion of how the problem relates to this class (what principles covered in class are important in solving the problem?)
- A reference for where you found the story

ACADEMIC INTEGRITY

The University's statement on academic integrity, from which the following statement is drawn, is available at **http://www.psu.edu/dept/oue/aappm/G-9.html**

Academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner. Academic integrity is a basic guiding principle for all academic activity at The Pennsylvania State University, and all members of the University community are expected to act in accordance with this principle. Consistent with this expectation, the University's Code of Conduct states that all students should act with personal integrity, respect other students' dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their efforts.

All students are expected to act with civility, personal integrity; respect other students' dignity, rights and property; and help create and maintain an environment in which all can succeed through the fruits of their own efforts. An environment of academic integrity is requisite to respect for self and others and a civil community.

Academic integrity includes a commitment to not engage in or tolerate acts of falsification, misrepresentation or deception. Such acts of dishonesty include cheating or copying, plagiarizing, submitting another persons' work as one's own, using Internet sources without citation, fabricating field data or citations, "ghosting" (taking or having another student take an exam), stealing examinations, tampering with the academic work of another student, facilitating other students' acts of academic dishonesty, etc.

Students charged with a breach of academic integrity will receive due process and, if the charge is found valid, academic sanctions may range, depending on the severity of the offense, from F for the assignment to F for the course.

COURSE SCHEDULE (subject to change, if topics require more lecture time)

WEEK/DATE	TOPIC	LEC	READING	QUIZ
1 / Aug. 30	Course Introduction	1	Ch. 1	
1 / Sept. 1	Principles of Flow	2	Ch. 2	
2 / Sept. 6	Control Vol & Continuity	3	3.1-3.2	
2 / Sept. 8	Energy	4	3.3	Quiz 1 (Lec 1-3)
3 / Sept. 13	Momentum/Pressure Forces	5	3.4-3.5	
3 / Sept. 15	Hydrostatics/Vel. Dist.	6	3.6	Assignment 1 Due
4 / Sept. 20	Hydrologic Cycle/Precipitation	7	7.1-7.2.2	
4 / Sept. 22	Design Storms/Limiting Storms	8	7.2.3-7.2.5	Quiz 2 (Lec 4-7)
5 / Sept. 27	Evaporation/Energy Balance	9	7.3-7.3.1	
5 / Sept. 29	Evaporation/Other Methods	10	7.3.2-7.3.3	Assignment 2 Due
6 / Oct. 4	Infiltration/Unsaturated Flow	11	7.4-7.4.1	
6 / Oct. 6	Infiltration/Unsaturated Flow	12	7.4.2	Quiz 3 (Lec 8-11)
7 / Oct. 11	Groundwater Flow Eqns	13	6.1-6.2.1	
7 / Oct. 13	Steady 1-D GW Flow	14	6.2.1, 6.3	Assignment 3 Due
8 / Oct. 18	Surface Runoff—Basins/Losses	15	8.1-8.2	
8 / Oct. 20	Unit Hydrograph	16	8.3	Quiz 4 (Lec 12-15)
9 / Oct. 25	Unit Hydrograph, Overland Flow	17	8.4-8.5	
9 / Oct. 27	Reservoir and Stream Routing	18	9.1-9.3	Assignment 4 Due
10 / Nov. 1	Saint-Venant Equations	19	9.4	
10 / Nov. 3	Probability Concepts	20	10.1	Quiz 5 (Lec 16-19)
11 / Nov. 8	Common Distributions	21	10.2	
11 / Nov. 10	Water Excess Mgmt	22	10.3	Assignment 5 Due
12 / Nov. 15	Hydrologic Frequency Analysis	23	10.4	
12 / Nov. 17	Flood Frequency Analysis	24	10.5	Quiz 6 (Lec 20-23)
13 / Nov. 22	**NO CLASS ☺**			
13 / Nov. 24	**NO CLASS ☺**			
14 / Nov. 29	Flood Control	25	14.1-14.3	
14 / Dec. 1	Flood Damage Estimation	26	14.4	Assignment 6 Due
15 / Dec. 6	Flood Damage Reduction	27	14.5	
15 / Dec. 8	None	28		Quiz 7 (Lec 24-27)
	LATE DROP NOV 16			