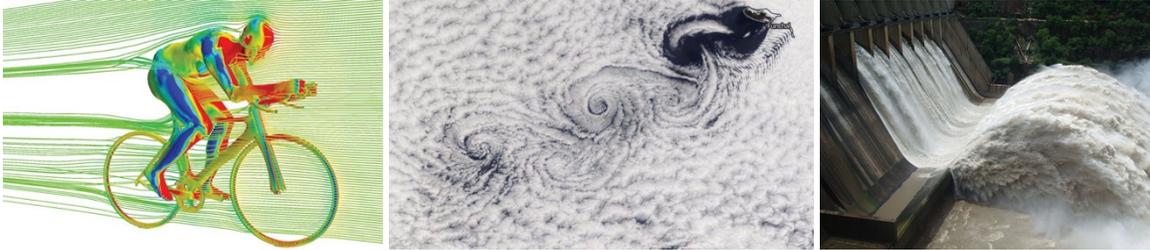


**Instructor:** Roger (Ruo-Qian) Wang  
**Office Hours:** 12-1pm on Thu, Weeks Hall Office 328E  
**Email:** [rj.wang@rutgers.edu](mailto:rj.wang@rutgers.edu)

**Grader:**  
**Email:**

### Welcome to Fluid Mechanics (14:180:387)!



#### Text:

1. "A brief introduction to fluid mechanics" 5th edition by Young, Munson, Okiishi, Huebsch (Wiley) Access to online supplements is recommended but not required so you can learn from the videos and try the FE exam questions. The international edition and earlier editions are not recommended because the problem numbers do not match – please be prepared to ‘translate’ the differences should you purchase this type of text. A copy of the text is on reserve at the Library of Science and Medicine.
2. Kundu, Pijush K., Ira M. Cohen, and D. R. Dowling. "Fluid Mechanics" (2008). Available from the Rutgers Library. Online version is free to view (<https://ebookcentral.proquest.com/lib/rutgers-ebooks/detail.action?docID=534929>, **login required**).

#### Grading

10% Homework, 30% Exam #1, 30% Exam #2, 30% Final

**Homework:** Students are encouraged to discuss HW problems in teams. To facilitate timely grading and to encourage students to stay on schedule, late homework will not be graded. The lowest homework grade will be dropped. HW problems should be turned in *scanned or electronic version*, in order, with work shown (list knowns, write out equations before substituting, include units). *Be sure to write your name, date, assignment number, and the names of any students with whom you discussed the assignment on ALL pages you submit. As a general rule, the (4/5) majority of homework points will be given for neatness and approach/logic, and 1/5 for reaching the correct solution.*

A sincere effort will be made to grade and return all assignments in a timely manner. In the event that graded homework cannot be returned before an exam, solutions will be posted on Canvas such that you can check your work. *Thus, it may be a good idea to make a copy/scan your homework before submitting it. It is the student's responsibility to use the answer keys to check any un-graded problems and to seek help from the instructor as needed.*

**Exams and Final:** To assess individual learning, exams are **likely** open book. The exam must be completely individually without discussion with classmates. Accessing cell phones or other portable electronic devices is not permitted during examinations, and any associated activity will be assumed to be inappropriate, resulting in immediate ending of one's examination.

**Accommodations:** Students requiring special accommodations should contact the instructor by Oct 8<sup>th</sup> to discuss arrangements (<http://disabilityservices.rutgers.edu/request.html>). Excused absences/exam conflicts will be handled following the guidelines provided by the OAA (<http://www.soe.rutgers.edu/oa/exams>).

**Community:** As a Rutgers student, you are a member of a community of learners, as such students are expected to follow the RU code of conduct (<http://studentconduct.rutgers.edu/university-code-of-student-conduct>).

**Ethics:** The RU code of Academic Integrity applies to this course and will be enforced ([http://studentconduct.rutgers.edu/files/documents/AI\\_Policy\\_9\\_01\\_2011.pdf](http://studentconduct.rutgers.edu/files/documents/AI_Policy_9_01_2011.pdf)). Students are encouraged to discuss study problems, but individual assignments and exams must reflect the work of the student receiving the grade. To protect students performing honest work, I seek the harshest possible punishment for all students suspected of cheating.

***In this class, cheating is considered to include (but is not limited to):***

1. Copying or letting someone copy your assignment or exam
2. Sharing a calculator during an exam
3. Having another student representing you or representing another student in class or during an exam
- 4. Using solutions manuals or solutions websites to complete assignments**
5. Changing an exam grade or solution and submitting for a re-grade
6. Lying about or falsifying paperwork used to arrange for alternate submission of assignments or rescheduled exams
- 7. Posting course materials or solutions online**
8. Switching an exam or answer sheet with another student during an exam
9. Speaking with any other student while the exam is in progress
10. Submitting assignments with work that does not logically match the solutions
11. Accessing notes, assignments, or exams from previous semesters
12. Submitting assignments from previous semesters
13. Continuing to work on an exam once time has been called

**Conduct.** The lectures provide supplemental material to the readings and review the more difficult topics in depth, so it is in your best interest to not only attend class but to remain engaged in lectures/discussions/activities. If you miss a class, it is your responsibility to make sure you are aware of any announcements that have been made and that you are familiar with the material covered in class and homework assignments. This year, the class is planned to be delivered online in real-time. No class recording will be posted online. The class format might be subject to change depending on the class progress.

**Grading.** Your grade is important and I encourage you to bring substantial errors (> 3%) in grading to my attention. Written requests for re-grading will be considered if submitted promptly (within 1 week after

an assignment is returned). Your written request must be accompanied by the original *unaltered* work under contention. (We photocopy select assignments and exams. Students caught submitting altered assignments will be written up for a violation of the RU Academic Integrity policy.) Please note, *regrading can result in adding, subtracting, or no change in points*, raising, lowering, or resulting in no change to the grade. All sections on an assignment submitted for regrading will be regraded. Emailed requests for regrades will not be granted.

**Masks:** In order to protect the health and well-being of all members of the University community, masks must be worn by all persons on campus when in the presence of others (within six feet) and in buildings in non-private enclosed settings (e.g., common workspaces, workstations, meeting rooms, classrooms, etc.). Masks must be worn during class meetings; any student not wearing a mask will be asked to leave. Masks should conform to CDC guidelines and should completely cover the nose and mouth: <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/about-facecoverings.html> Each day before you arrive on campus or leave your residence hall, you must complete the brief survey on the My Campus Pass symptom checker self-screening app.

**Absence:** Students who have been told to quarantine, or are experiencing symptoms of any transmittable disease, are encouraged to remain at home and not attend in-person class meetings. Alternate assignments or other accommodations to students who cannot attend class because of their own illness or their need to quarantine after having been exposed to someone with Covid-19. Please email the instructor for a specific arrangement. A student who is quarantined, and not themselves ill, is allowed to participate in the class through Zoom meetings (the classroom settings need to be doublechecked).

**Recording.** Audio, video, or photographic recording of class is not allowed without the instructor’s written permission.

*Rutgers University Copyright Policy states that “Faculty, teaching assistants, and graduate assistants also own copyright to pedagogical materials, including materials in electronic format or posted to a website, that they develop in the regular course of their teaching duties using resources ordinarily available to all or most faculty members (as described in the section of this policy concerning Use of Substantial University Resources).*

**The following is the *non-negotiable* final grading rubric. Further, the amount of partial credit awarded on assignments is also *non-negotiable*.**

**There will NOT be extra credit assignments in this course. The grade cut-offs are listed below and are unlikely to significantly change.**

Typical Characteristic of Students in Each Category Range	Overall Average	Letter Grade
Willing to go beyond the minimum requirements, volunteers and is actively engaged in class and is willing and capable of helping others in learning material. Demonstrates excellent understanding of material on all homework and exams, and rarely makes conceptual or algebraic mistakes. Strong team member. An overall exceptional effort.	90-100	A
	80-84.9	B

Demonstrates a good understanding of material needed for future environmental engineering course work. Completes all assignments with very few conceptual and algebraic mistakes. Very good team member. Attends and remains actively engaged in class.	85-89.9	B+
Very few absences, is almost always engaged during class, completes nearly all HW. A satisfactory and solid effort. Makes few conceptual and algebraic mistakes on coursework.	60-74.9	C
	75-79.9	C+
	54.5-59.9	D
Several absences and/or has difficulty regularly engaging during class. More prone to conceptual errors, usually due to poor attendance and/or failure to complete most HW assignments. Could apply material to engineering practice with substantial supervision.	< 54.5	F
Often absent, frequently skips assignments, poor team member. Could not reasonably apply material without endangering the public.		

**By staying enrolled in this course after the syllabus is distributed, you are agreeing to the course policies described in the syllabus.**

## Tips for success:

**-Come to class!** Fall 2013 students who were in class the day Exam 1 was returned averaged 15% higher than students who were absent the day the exam was returned.

**-Remain engaged in class!** Class will include activities and problems you will try on your own and/or in groups. These are a great way to 'test' yourself on concepts. Following along with a solution is part of learning, but frequently the 'why' and 'how' of problem solving are not fully understood until you try solving on your own. ***Simply showing up is not enough!***

**-Stop multitasking during class!** You're not only distracting yourself when you check email, watch tv, surf the web, etc. during class, you're also distracting every classmate within view of your screen and behavior. Evidence: Students within view of others multitasking during class scored 17 points below those not in view of others multitasking: <http://www.npr.org/blogs/13.7/2013/08/19/213439794/stop-multitasking-it-s-for-other-people-s-good>

**-Ask questions during class!** *If you have a question it is likely several of your classmates do too.* Help everyone by letting the professor know *in real-time* when lecture is moving too fast, you can't read a variable on the board, you don't understand why a problem is being solved a certain way, etc. Your feedback is critical to improving class.

**-Ask questions and come to office hours. Contacting me after taking an exam or after final grades are submitted is too late!** I'm happy to work with students working on all levels to improve understanding of class concepts, study skills, and/or test taking strategies, but **it is your responsibility to seek help in a timely manner.**

-If you have a life event, illness, etc. that prevents you from being fully engaged in class, follow the rules for submitting excuses **before** assignments are due or seating for exams occurs so you are not penalized.

-**Form a study group** or contact me to help find one. Your classmates are amazing teachers and are usually quite excited to help you. Teaching others is a great way to solidify your understanding of a subject.

-**Do all the homework!** Students who try all the homework not only receive higher homework grades, they are also better prepared for the exams. A good strategy for homework is to try it on your own, check your solutions in a group, and come see me to fill in any gaps. Google is not a good study partner.

-Make sure you're **studying effectively**. 'Quiz' yourself on the in-class examples, homework, key definitions, and concepts. You should understand and be able to explain the 'how' and 'why' of the approach you're using to solve problems. Note: reading and re-reading the notes/chapters is part of a good studying strategy – but re-reading the book or class notes is unlikely to be effective for many students for long term learning. (<http://www.wnyc.org/story/science-smart/> Start @ 28:47; <http://www.washingtonpost.com/blogs/answer-sheet/wp/2013/08/27/study-techniques-that-work-and-surprisingly-dont/>).

-**Have Academic Integrity**. Once you leave RU you'll likely be designing projects that affect people's lives. Developing ethical work habits now is essential. Once you leave here performing unethical work can result in endangering lives, job loss, and/or legal penalties: [http://www.nj.gov/dep/newsrel/2013/13\\_0101.htm](http://www.nj.gov/dep/newsrel/2013/13_0101.htm). At RU, the consequences for violating AI policy are serious. If that isn't discouraging enough, please note that going through the AI process is time consuming and unpleasant.

-**Treat your classmates with respect** and make an effort to **make positive connections** now. The engineering world is quite small, it is likely you will run into one another professionally after graduation.

-**Use proper etiquette, grammar, and headings** in your email messages. As an upper level you should have and be demonstrating professional communication skills. Even if you send an email from a mobile device, you should be able to punctuate, capitalize, write a proper greeting, and sign your name.

### Intended Class Schedule

Week	Topic	Notes
1	Introduction and Fluid Property	
2	Static Pressure	
3	Buoyancy and Pressure Measurement	HW1 out
4	Hydrostatic Forces on Flat Surfaces	HW 1 in, HW 2 out
5	Hydrostatic Forces on Curved Surfaces	HW 2 in
6	Description of Fluid Motion	
7	Summary I	<b>Midterm 1</b>

8	Conservation of Mass, Momentum Principle	HW 3 out
9	Bernoulli Equation, Review of Midterm 1	
10	Energy Equation	HW 3 in
11	Summary II	<b>Midterm 2</b>
12	Viscosity	HW 4 out
13	Dimensional Analysis	HW 4 in, HW 5 out
14	Pipe Flow I	
15	Pipe Flow II	HW 5 in
16	Summary III	<b>Final Exam</b>