

**Fluid Mechanics**  
EGN 3353C Section 28C5  
**Class Periods:** MWF | Period 5 (11:45 AM - 12:35 PM)  
**Location:** PSY0130  
**Academic Term:** Spring 2026

**Instructor:**

Dr. Sunjae Kim

Email: [sunjae.kim1@ufl.edu](mailto:sunjae.kim1@ufl.edu) (please contact me through Canvas only for class)

Office Hours: MF 10:30 – 11:30 AM, NEB 527

**Teaching Assistant/Peer Mentor/Supervised Teaching Student:**

TA1: Sanketh Challagulla - Email: [schallagulla1@ufl.edu](mailto:schallagulla1@ufl.edu) / Office Hours: 10:30 am – 12:00 pm (Th)

TA2: TBD

**Course Description**

Statics and dynamics of incompressible fluids. Application to viscous and inviscid flows. Dimensional analysis. Compressible flow. Credits: 3

**Course Pre-Requisites / Co-Requisites**

MAC 2313, EGM 2511 and EML 3100, or EML 3007

**Materials and Supply Fees:**

none

**Course Objectives**

This course provides an introduction to fluid mechanics. It stresses fundamental engineering science principles applied to fluid mechanical systems. Students will learn the governing integral and differential equations for viscous and inviscid fluids and will apply these equations to internal and external flows. Upon completion of this course, students are expected to have developed a working understanding of the basic theory of incompressible fluid mechanics. Students will learn problem-solving techniques and have the opportunity to apply these techniques to a variety of problems.

**Relation to Program Outcomes (ABET):**

This course utilizes fundamentals of mathematics, physics, and chemistry to develop analytical methodologies for engineers to utilize for design and analysis work of fluid machines and systems.

Outcome	Coverage*
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	High
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	Medium
3. An ability to communicate effectively with a range of audiences	
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	

### **Required Textbooks and Software**

Philip Gerhart, Andrew Gerhart, John Hochstein, "Munson, Young, and Okishii's Fundamentals of Fluid Mechanics," 9th Edition, Wiley, ISBN-9781119598114

- This course is participating in UF All Access, which is a program designed to provide the most affordable option for students: <https://www.bsd.ufl.edu/allaccess>. The required course material is delivered digitally through WileyPlus, containing a fully searchable e-text and the required homework for this course. You purchase an access code at a discounted price through UF All Access.
- This link authorizes the cost of the access code to be charged directly to your student financials account.

### **Recommended Materials**

*Fox and McDonald's, Fluid Mechanics, 10<sup>th</sup> Edition, Wiley*

### **Required Computer**

It is important that you have your own computer. Details are provided on both the department and college websites:

- <https://www.eng.ufl.edu/students/resources/computer-requirements/>
- <https://mae.ufl.edu/academics/prospective/undergraduate/computer-requirements/>

### **Course Schedule**

See table at the end of this syllabus.

### **Attendance Policy, Class Expectations, and Make-Up Policy**

Regular class attendance is expected as it will improve your performance in the course. Late HW and makeup exams are only allowed for students with documented circumstances consistent with UF policy. Students must contact the instructor as soon as possible to provide documentation and request a make-up exam. Excused absences must be consistent with university policies in the undergraduate catalog and require appropriate documentation. For more information on UF policies see [https://catalog.ufl.edu/UGRD/academic regulations/attendance-policies/](https://catalog.ufl.edu/UGRD/academic%20regulations/attendance-policies/)

### **Evaluation of Grades**

Assignment	Percentage of Final Grade
Homework Sets	20%
Exam 1*	25%
Exam 2*	25%
Final Exam	30%
<b>Total</b>	<b>100%</b>

### **Homework**

HW assignments will be posted to Canvas and you will have one week to submit electronically via the Canvas assignment portal. No email or hard copy submissions will be accepted. Answers should be clearly marked and all writings should be legible. All problem solutions and grades will be posted on Canvas. Late submission policies are: (i) if late within 24 hours, your maximum score will be 80%, (ii) if late by more than 24 hours but less than 48 hours, your maximum score will be 60%, and (iii) if late by more than 48 hours, you will get a zero.

See the last page for an example homework solution format.

### **Exams**

Exams are closed-book but you are allowed to use one sheet of letter-sized paper (8.5" by 11.5") with your **hand-written** notes on **one side** for the midterm exams and **two sides** for the final exam. If you cannot attend the scheduled exams due to non-emergency events (e.g., conflicts with official university activities), you must contact Dr. Kim 1 week prior to the exam and provide documentation. Make-up exams will only be given in very rare instances (e.g., medical and family emergencies) with documentation and/or pre-approval by Dr. Kim.

### ***Grading Policy***

The following grade scale represents the minimum grade. Effort and monotonic exam progress may be taken into account.

Percent	Grade	Grade Points
93.4 - 100	A	4.00
90.0 - 93.3	A-	3.67
86.7 - 89.9	B+	3.33
83.4 - 86.6	B	3.00
80.0 - 83.3	B-	2.67
76.7 - 79.9	C+	2.33
73.4 - 76.6	C	2.00
70.0 - 73.3	C-	1.67
66.7 - 69.9	D+	1.33
63.4 - 66.6	D	1.00
60.0 - 63.3	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

### ***Notice of Copyright***

Materials in this course – unless otherwise indicated – are protected by United States copyright law [Title 17, U.S. Code]. Materials are presented in an educational context for personal use and study and should not be shared, distributed or sold in print – or digitally – outside the course without permission.

### ***Students Requiring Accommodations***

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

### ***Course Evaluation***

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluer.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

### ***In-Class Recording***

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

### ***University Honesty Policy***

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<https://sccr.dso.ufl.edu/process/student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

### ***Commitment to a Safe and Inclusive Learning Environment***

The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our community and is committed to supporting the University’s core values, including the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information, and veteran status.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- HWCoe Human Resources, 352-392-0904, [student-support-hr@eng.ufl.edu](mailto:student-support-hr@eng.ufl.edu)
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, [taylor@eng.ufl.edu](mailto:taylor@eng.ufl.edu)
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, [nishida@eng.ufl.edu](mailto:nishida@eng.ufl.edu)

### ***Software Use***

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

### ***Student Privacy***

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <https://registrar.ufl.edu/ferpa.html>

### ***Campus Resources:***

#### ***Health and Wellness***

##### **U Matter, We Care:**

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu) so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing

staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

**Counseling and Wellness Center:** <https://counseling.ufl.edu>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

**Sexual Discrimination, Harassment, Assault, or Violence**

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, [title-ix@ufl.edu](mailto:title-ix@ufl.edu)

**Sexual Assault Recovery Services (SARS)**

Student Health Care Center, 392-1161.

**University Police Department** at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

Academic Resources

**E-learning technical support**, 352-392-4357 (select option 2) or e-mail to [Learning-support@ufl.edu](mailto:Learning-support@ufl.edu).  
<https://lss.at.ufl.edu/help.shtml>.

**Career Connections Center**, Reitz Union, 392-1601. Career assistance and counseling; <https://career.ufl.edu>.

**Library Support**, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

**Teaching Center**, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.  
<https://teachingcenter.ufl.edu/>.

**Writing Studio, 302 Tigert Hall**, 846-1138. Help brainstorming, formatting, and writing papers.  
<https://writing.ufl.edu/writing-studio/>.

**Student Complaints Campus:** <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>; <https://care.dso.ufl.edu>.

**On-Line Students Complaints:** <https://distance.ufl.edu/getting-help/>; <https://distance.ufl.edu/state-authorization-status/#student-complaint>.

# EGN 3353C Fluid Mechanics – Tentative Course Schedule Spring 2026

#			Lecture Topic	HW Schedule
1	M	1/12	Lecture 1: Course Intro (Syllabus), Continuum concept, Properties	
2	W	1/14	Lecture 2: Velocity Field, Flow Visualization	
3	F	1/16	Lecture 3: Viscosity, Stress field in flow	
-	M	1/19	Holiday – No class	
4	W	1/21	Lecture 4: Pressure, Pressure variation, Manometry (Ch.2.1-2.7)	
5	F	1/23	Lecture 5: Hydrostatic Force, Buoyancy Force (Ch. 2.8-2.11)	HW1
6	M	1/26	Lecture 6: Basic Laws for control volume; Reynolds Transport Theorem (Ch. 4.3-4.4)	
7	W	1/28	Lecture 7: Basic Laws for control volume; Conservation of mass (Ch. 5.1)	
8	F	1/30	Lecture 8: Basic Laws for control volume; Conservation of momentum I (Ch. 5.2)	HW2
9	M	2/2	Lecture 9: Bernoulli Equation (Ch. 3.1-3.6)	
10	W	2/4	Lecture 10: Basic Laws for control volume; Conservation of momentum II (Ch. 5.2)	
11	F	2/6	Lecture 11: Basic Laws for control volume; Conservation of momentum III (Ch. 5.2)	
12	M	2/9	Lecture 12: Basic Laws for control volume; Conservation of Energy (Ch. 5.3)	HW3
13	W	2/11	Lecture 13: <i>Review and Practice</i>	
-	F	2/13	<b>Exam 1 : Exam 1 (In-class)</b>	
14	M	2/16	Lecture 14: Differential Formulations, Acceleration Field (Ch. 6.1)	
15	W	2/18	Lecture 15: Differential Form Mass Conservation (Ch. 6.2)	HW4
16	F	2/20	Lecture 16: Differential Form Linear Momentum Conservation (Ch. 6.3)	
17	M	2/23	Lecture 17: Couette Flow (Ch. 6.9.2)	
18	W	2/25	Lecture 18: Poiseuille Flow (Ch. 6.9.3)	
19	F	2/27	Lecture 19: CFD simulations– Guest Lecture - Microgravity Fluid physics (TBD)	HW5
20	M	3/2	Lecture 20: Revisit to Bernoulli Equation, Potential flow	
21	W	3/4	Lecture 21: Dimensional analysis, Pi-Theorem (Ch. 7.1-7.3)	
22	F	3/6	Lecture 22: Dimensional analysis, Similarity and Scaling (Ch. 7.1-7.3)	
23	M	3/9	Lecture 23: <i>Review and Practice</i>	HW6
-	W	3/11	<b>Exam 2 : Exam 2 (In-class)</b>	
24	F	3/13	Lecture 24: Intro to Boundary layer, Boundary layer thickness (Ch. 9.2)	
-	M	3/16	Spring Break – No class	
-	W	3/18	Spring Break – No class	
-	F	3/20	Spring Break – No class	
25	M	3/23	Lecture 25: Boundary layer thickness (Ch. 9.2)	
26	W	3/25	Lecture 26: Momentum integral equation; Laminar boundary layer (Ch. 9.2)	
27	F	3/27	Lecture 27: Turbulent boundary layer (Ch. 9.2)	HW7
28	M	3/30	Lecture 28: Pressure gradient effects; Boundary layer separation (Ch. 9.2)	
29	W	4/1	Lecture 29: Flow over immersed bodies; Drag (Ch. 9.3)	
30	F	4/3	Lecture 30: Flow over immersed bodies; Lift (Ch. 9.4)	
31	M	4/6	Lecture 31: Pipe flow I: Intro (Ch. 8.1-8.3)	HW8
32	W	4/8	Lecture 32: Pipe flow II: Head loss calculations (Ch. 8.1-8.3)	
33	F	4/10	Lecture 33: Pipe flow III: Major, Minor, Charts (Ch. 8.4)	
34	M	4/13	Lecture 34: Solving pipe flows (Ch. 8.5)	
35	W	4/15	Lecture 35: Fluid Machinery; (Ch.12.4)	HW9
36	F	4/17	Lecture 36: Performance Characteristics	
37	M	4/20	Lecture 37: Net positive suction head	
38	W	4/22	Lecture 38: Final Review	HW10
-	M	4/29	<b>Final Exam (10:00 – 12:00 PM)</b>	

## HOMEWORK SUBMISSION EXAMPLE FORMAT

**Find**: State concisely what the problem is asking for.

**Schematic**: Draw a schematic of the problem. Label important variables. Be sure to identify and show appropriate control volume and surfaces, if applicable.

**Given**: Properties known. What is given in the problem?

**Assumptions**: Assumptions are the start of your analysis process to simplify the problem. State all the assumptions you are making.

**Analysis**: Show clear logical process to finding the answer to the problem. It helps to write down your plan on how you are going to solve it. Then, show each step.

**Answer**: Clearly mark your answer.