



## ENGR 3343.02 – Fluid Mechanics

<u>Instructor Details</u>		<u>Course Details</u>	
<b>Instructor:</b>	Amy Borello Gruss, Ph.D.	<b>Term:</b>	Fall 2017
<b>Office:</b>	L-158	<b>Classroom:</b>	Q-311
<b>Office Hrs:</b>	M/W: 1:15-2:00; & T/Th: 12:15-2:00 pm or by appointment	<b>Time:</b>	MW 2:00-3:15 pm
<b>Email address:</b>	<a href="mailto:agruss@kennesaw.edu">agruss@kennesaw.edu</a>	<b>Credit Hours:</b>	3-0-3 (Lecture-Lab-Total)
		<b>Prerequisite:</b>	ENGR 2214 (Statics)

**COURSE DESCRIPTION:** Study of force vectors, equilibrium of particles, equilibrium of rigid bodies in two and three dimensions; trusses, friction, centroids, and moments of inertia.

**REQUIRED or ELECTIVE:** Required

**REQUIRED TEXT:** **Mechanics of Fluids** by Merle C. Potter, David C. Wiggert, Bassem H. Ramadan, Cengage Learning, 5th Edition, 2016, ISBN-10: 1305635175, ISBN-13: 9781305635173.

**NCEES: FE Reference Handbook.** This text can also be downloaded for FREE in the provided link below (<http://ncees.org/exams/study-materials/download-fe-supplied-reference-handbook/>).

**OTHER MATERIALS:** Handouts may be provided as needed. **Kennesaw email** and **GeorgiaView Desire 2 Learn (D2L)** systems will be used for messages and part of the content delivery. Students should access these sites on a daily basis. *Disclaimer: Please do NOT email me through D2L as I will not be checking these regularly. To contact me, please email me at my **KSU email: agruss@kennesaw.edu.***

**ELECTRONIC COMMUNICATIONS:** The University provides all KSU students with an “official” email account with the address “students.kennesaw.edu.” As a result of federal laws protecting educational information and other data, **this is the sole email account you should use to communicate with your instructor or other University officials.**

**COURSE LEARNING OUTCOMES:** Upon successful completion of this course, students shall be able to:

1. Apply Archimedes principle to fluid static problems
2. Determine the stability of objects
3. Solve manometer problems
4. Determine resultant forces on submerged surfaces
5. Solve impulse and momentum problems using conservation principles
6. Apply the general energy equation to fluid flow systems
7. Analyze normal flow using the Manning equation
8. Analyze pumping systems

## COURSE REQUIREMENTS:

- 1. Communications, Grading, and Response Timeframe:** The best way to communicate with me is by **KSU email**. Please do not send emails through D2L as it will not be checked regularly. Grading of homeworks/assignments may take up to a week. I will try to respond to any discussions/comments/questions **by the close of the following business day.**
- 2. Homework:** All problem assignments must be submitted in the next class/week following the class in which the topic is discussed or finished, or any other date assigned by the instructor.
  - A physical copy of the homework is due at the **START** of class on the due date.
  - Homework turned in one class period late will lose 25% of the possible score.
  - Assignments **WILL NOT be accepted more than one class late** without prior instructor consent. Exceptions may be considered in case of illness, serious emergencies, or other university sponsored activities. However, appropriate evidence must be presented in order to qualify for exceptions.
  - All homework must be submitted on 8½"x11" white paper, engineering graph paper, or on the assigned printed worksheet.
  - Fold the assignment in half (the long way), and on the outside of the folded sheet write your (1) name, (2) course number, (3) assignment number (i.e, HW1, HW2...), and (4) date submitted.
  - If calculations are required, show all your work for full credit.
  - Box or Underline your answers. Illegible handwriting will not be graded.
  - Graded homework will be returned to students; however, students need to preserve them until the grades are finalized and show them to the instructor if there is any dispute in final grades.
- 3. Exams/Quizzes:** All exams/quizzes are closed books and notes. However, **NCEES FE Handbook can be used** during the Exams and Quizzes. **NO make-up** exams/quizzes will be given. Exceptions may be considered in case of illness, serious emergencies, or other university sponsored activities. However, appropriate evidence must be presented in order to qualify for exceptions. Graded exams/quizzes will be returned to students; however, students need to preserve them until the grades are finalized and show them to the instructor if there are any disputes in final grades. Typically, quizzes will be in class the date assigned by the instructor. Exam dates will be confirmed in class and posted on D2L Brightspace on the D2L calendar.
- 4. Attendance Policy:** Students are required to attend classes. Advance notice of an absence should be provided whenever possible. The instructor will randomly take attendance during the semester. Students with more than 2 unexcused absence will get points deducted from their overall attendance grade (more than 2 unexcused absences will receive a 0.5/3 point deduction for each absence). Makeup exams, quizzes, and acceptance of late assignments will be considered only for documented medical reasons, emergency circumstances, or other university sponsored activities.
- 5. What is Plagiarism?:** KSU defines Plagiarism as the practice of taking someone else's work or ideas and passing them off as one's own. When unaware or uncertain on how to properly cite a particular source, please do not neglect to add the citation — KSU considers not doing so as plagiarism. If you have questions on how to cite your work, please contact me immediately! For more information, please refer to the "Plagiarism Policy" under the *Policies* section of this syllabus.
- 6. Plagiarism Policy:** KSU considers committing plagiarism as an act of academic dishonesty, and takes all occurrences very seriously. Any instances where academic dishonesty is suspected will result in

an automatic grade of a zero for all students involved. The instructor reserves the right to remove any student from the class if the student's behavior is of a disruptive nature or if there is an evidence of academic dishonesty. Further disciplinary action may be taken such as suspension or expulsion from the University.

7. **FERPA:** The Family Education Rights and Privacy Act (FERPA) is a federal law designed to protect the privacy of educational records by limiting access to these records, and precludes Southern Polytechnic State University from providing information regarding the student to anyone without written authorization. Examples of records not released are grades; grade point average; the specific number of hours/credits enrolled, passed, or failed; Social Security Number; student ID number; name of parents or next of kin; and/or residency status.
8. **Ethics and Sexual Harassment Policy:** Sexual harassment in any situation is reprehensible. It subverts the mission of the University, and threatens the careers of students, faculty, and staff. It is viewed as a violation of Title VII of the 1964 Civil Rights Act as amended by the 1991 Civil Rights Act. Sexual harassment will not be tolerated at KSU. KSU is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, religion, color, sex, national origin, disability, age, sexual orientation, or veteran status. In adhering to this policy, the University abides by the requirements of Title IX of the Education Amendments of 1972; by Title VII of the Civil Rights Act of 1964, as amended by the Civil Rights Acts of 1991; by Sections 504 and 504 of Rehabilitation Act of 1973; by Executive Order 11246, as amended by 38 U.S.C. 2012; the Vietnam Era Veterans Readjustment Assistance Act of 1972, as amended; and by other applicable statutes and regulations relating to equality of opportunity. This policy on sexual harassment applies to the entire University and to the conduct of students, faculty, and staff alike.
9. **Student Rights and Responsibilities:** Students of KSU are entitled to an environment that is conducive to learning and individual growth. To this end, students enrolling at KSU assume a responsibility to abide by the policies and regulations expressed in this section. By doing so, students may fulfill their responsibilities and enjoy the exercise of their own rights while also respecting the rights of others. Information about the student rights and responsibilities can be found at <http://catalog.kennesaw.edu/content.php?catoid=27&navoid=2263>
10. **Project & Presentation:** There will be no project in the course or presentation in this course.
11. **Academic Honesty/Integrity:** KSU has an academic honesty/integrity and a procedure for handling cases when academic misconduct is alleged. All students should be aware of them. Information about the academic honesty/integrity and the misconduct procedure can be found at <https://web.kennesaw.edu/scai/content/ksu-student-code-conduct>.
12. **ADA Provisions:** Students with disabilities, as defined by the Americans with Disabilities Act (ADA) of 1990, should contact the instructor during the first week of the semester regarding the accommodations necessary to complete the requirements of this course. The instructor, with the help of KSU, will make reasonable adjustments to take into consideration the specific handicap of each student covered under the ADA." The students can also contact KSU Marietta Campus ADA coordinator at 678-915-7244 for additional help.  
[http://www.kennesaw.edu/stu\\_dev/dsss/policies.shtml](http://www.kennesaw.edu/stu_dev/dsss/policies.shtml).

13. **Grade Dispute/Appeal:** Final grade dispute/appeal must be submitted within a week of the final exam. The procedure has been outlined in the KSU website that can be accessed via the link at [http://www.kennesaw.edu/registrar/policies/grade\\_appeals.php](http://www.kennesaw.edu/registrar/policies/grade_appeals.php).

14. **Useful Resource:** The KSU Writing Center helps students in all majors improve their writing. Experienced, friendly writing assistants help with topic development, revision, research, documentation, grammar, and more. For more information or to make an appointment, visit [writingcenter.kennesaw.edu](http://writingcenter.kennesaw.edu) or stop by English Building, Room 242 (Kennesaw campus) or Johnson Library, Room 121 (Marietta campus).

**15. Additional Resources:**

- D2L Technical Support, go to <https://d2lhelp.view.usg.edu/> or call 678-915-HELP
- D2L Brightspace website at <https://kennesaw.view.usg.edu/d2l/login>
- KSU Help Desk Phone Number: (678) 915-HELP (4357).
- KSU Distance Learning at <http://distancelearning.kennesaw.edu/support/content-tools.php>
- KSU UITS at <http://uits.kennesaw.edu/>
- Accessibility policy of all technologies:  
<https://softchalkcloud.com/lesson/serve/jV10GKPftZwQn/html>

**GRADING POLICY:** All exams, quizzes, and assignments must be completed satisfactorily in order to pass the course. The evaluation process described below is subject to change by the instructor. Changes will be announced in class. Please visit <http://catalog.kennesaw.edu/content.php?catoid=24&navoid=2170> for KSU's detailed grading policy.

**Class Grade Components:**

Homework	15%
Quiz	18%
Mid Term 1	22%
Mid Term 2	22%
Final Exam	20%
<u>Attendance</u>	<u>3%</u>
Total	100%

**Class Grading scale and letter grade**

>90.0	A
89.9 – 80.0	B
79.9 – 70.0	C
69.9 – 60.0	D
<59.9	F
Withdrawal after deadline	WF

**TENTATIVE LECTURE TOPIC/OUTLINE:** The following lecture topic/outline is subject to change by the instructor. Changes will be announced in class.

Class/Week	Tentative Lecture Topic/Outline	Homework	Textbook Sections
Week 1	Topic 1: Introduction	HW # 1: 1.16, 1.26, 1.28, 1.29 (a) & (c), 1.30	1.1 – 1.4
Week 2	Topic 2: Fluid Properties	HW # 2: 1.35, 1.46, 1.53, 1.62, 1.68, 1.75	1.5 – 1.8
Week 3 – 4	Topic 3: Fluid Statics – Pressure, Manometer, Submerged Surfaces, Buoyancy, and Stability (L.O. #1-4)	HW # 3: 2.32, 2.38, 2.56, 2.62, 2.79, 2.94	2.4.3 – 2.4.7
	Labor Day – Monday, Sept. 4 <sup>th</sup>	No Class	
Week 4	Mid Term Exam 1	---	---
Week 5	Topic 4: Fluid Dynamics – Fluid Kinematics and The Bernoulli Equation	HW # 4: 3.12, 3.65, 3.70, 3.73	Chapter 3
Week 6	Topic 5: Control Volume Approach – Reynolds Transport Theorem and Continuity Equation	HW # 5: 4.34, 4.35, 4.36	4.4
Week 7	Topic 6: Control Volume Approach – Momentum Equation (L.O. #5)	HW # 6: 4.119, 4.120(a), 4.129, 4.135(a)	4.6
Week 8 - 9	Topic 7: Control Volume Approach – Energy Equation (L.O. #6)	HW # 7: 4.71, 4.74, 4.77, 7.120, 7.122, 7.129(a)	4.5 and 7.6.3 – 7.6.7
Week 9	Mid Term Exam 2	---	---
Week 10	Topic 8: Dimensional Analysis and Similitude	HW # 8: 6.14, 6.45, 6.52	6.2.3 and 6.3
Week 11 -12	Topic 9: Open Channel Flow (L.O. #7)	HW # 9: 7.144, 7.146, 10.7, 10.9 (a)	7.7 and 10.1 – 10.3
Week 13 - 14	Topic 10: Pump and Turbine (L.O. #8)	HW # 10: 12.13 12.21, TBD	12.3.3
Week 15	FALL BREAK	No Classes	--
Week 16	Topic 11: Drag and Lift	HW # 11: TBD	8.3.1 and 8.4
Week 17	Final Exam – Comprehensive	DECEMBER 6 <sup>th</sup> 1:00 – 3:00 pm	