

AME 309 – Dynamics of Fluids

Fall 2017

Units: 3.0

Lecture hours: Tuesday and Thursday, 12:00-1:50pm, MHP B7B

Instructor: Prof. Iván Bermejo-Moreno (email: bermejom@usc.edu)

Office hours: Monday 4-5pm, Friday, 3-5pm; RRB 215

Teaching Assistant: Jonathan Hoy (hoyj@usc.edu)

Office hours: Monday & Wednesday, 1-3pm, VHE

Textbook: Frank White, Fluid Mechanics, 8th Ed, McGraw-Hill, Inc. (recommended)

Grade breakdown:

- Homework: 15% of final grade.
- Project: 15% of final grade.
- Midterm exams: $2 \times 20\%$ of final grade.
- Final exam: 30% of final grade.

Discussion board

Piazza (<https://piazza.com>) will be used for all electronic discussions. Please post your questions (regarding homework assignments, class logistics, exams, etc.) on Piazza instead of using email. You can access Piazza through the Blackboard page for this course.

Assignment Submission Policy

- No late homework will be accepted.
- Discussion of homework assignments with your classmates is allowed but each student should develop and write their own original solution.
- Assignments should be submitted in stapled US letter-sized paper, with legible and logically organized solutions that explicitly include all necessary steps and assumptions (if any) made.
- Course grading policy and letter grade equivalence:
<http://arr.usc.edu/services/grades/gradinghandbook/gradingpolicies.html>

Academic Conduct

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Section 11, Behavior Violating University Standards <https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions>. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the Office of Equity and Diversity <http://equity.usc.edu> or to the Department of Public Safety <http://adminopsnet.usc.edu/departments/departments-public-safety>. This is important for the safety of the whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. The Center for Women and Men <http://www.usc.edu/student-affairs/cwm/> provides 24/7 confidential support, and the sexual assault resource center webpage <http://sarc.usc.edu> describes reporting options and other resources.

Support Systems

A number of USC’s schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the American Language Institute <http://dornsife.usc.edu/ali>, which sponsors courses and workshops specifically for international graduate students. The Office of Disability Services and Programs http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, USC Emergency Information <http://emergency.usc.edu> will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.

Course schedule – Weekly breakdown (HW = homework, PR = Project report)

W	Date	Topics	Assignment
1	Aug 22	Introduction to fluids; continuum hypothesis; dimensions	
	Aug 24	Kinematics	
2	Aug 29	Fluid statics	HW1 due
	Aug 31		
3	Sep 5	Analysis methods; systems and control volumes; fluxes	HW2 due
	Sep 7	Reynolds' transport theorem; conservation of mass	
4	Sep 12	Conservation of momentum	HW3 due
	Sep 14		
5	Sep 19	Bernoulli's equation	HW4 due
	Sep 21	Conservation of energy	
6	Sep 26	Differential analysis of fluid motion	
	Sep 28		
7	Oct 3	Stream function, vorticity, irrotationality, velocity potential	HW5 due
	Oct 5	Midterm 1	
8	Oct 10	Dimensional analysis and similarity & Project kick-off meeting	
	Oct 12		
9	Oct 17	Duct flow & Project discussion on methodology	PR1 due
	Oct 19		
10	Oct 24	Boundary layers	HW6 due
	Oct 26		
11	Oct 31	Flow past immersed bodies	PR2 due
	Nov 2	Potential flow	HW7 due
12	Nov 7	Midterm 2	PR3 due (optional)
	Nov 9	Introduction to compressible flow of perfect gases	
	Nov 10	Rocket Day	
13	Nov 14	Isentropic steady flow; smoothly varying cross-sectional area	
	Nov 16	Normal shock waves	
14	Nov 21	Nozzle flow	
15	Nov 28	Oblique shocks	HW8 due
	Nov 30	Prandtl-Meyer expansions	Final PR due
16	Dec 12	Final exam 11 am-1 pm	

Academic Dishonesty Sanction Guidelines

Violation	USC – Recommended sanction	AME – Recommended sanction
Copying answers from other students on any course work **	F for course	First offense: F on assignment Second offense: F for course
One person allowing another to cheat from his/her exam or assignment	F for course for both persons	If assignment: First offense: F on assignment Second offense: F for course If exam: F for course
Possessing or using material during exam (crib sheets, notes, books, etc.) which is not expressly permitted by the instructor.	F for course.	First offense: F on exam. Second offense: F for course.
Continuing to write after exam has ended.	F for course.	F on exam
Taking exam from room and later claiming that the instructor lost it.	F for course and recommendation for further disciplinary action (possible suspension).	F for course
Changing answers after exam has been returned.	F for course and recommendation for further disciplinary action (possible suspension).	F for course
Fraudulent possession of exam prior to administration.	F for course and recommendation for suspension.	F for course
Obtaining a copy of an exam or answer key prior to administration.	Suspension or expulsion from the university; F for course.	F for course
Having someone else complete course work for oneself.	Suspension or expulsion from the university for both students; F for course.	F for course
Plagiarism — Submitting other’s work as one’s own or giving an improper citation.	F for course.	First offense: F on assignment. Second offense: F for course.
Submission of purchased term papers or papers done by others.	F for course and recommendation for further disciplinary action (possible suspension).	F for course
Submission of the same assignment to more than one instructor, where no previous approval has been given.	F for both courses.	F for both courses
Unauthorized collaboration on an assignment.	F for the course for both students.	First offense: F on assignment. Second offense: F for course.
Falsification of information in admission applications (including supporting documentation).	Revocation of university admission without opportunity to reapply.	Revocation of university admission without opportunity to reapply.
Documentary falsification (e.g., petitions and supporting materials; medical documentation.)	Suspension or expulsion from the university; F for course when related to a specific course.	Suspension or expulsion from the university; F for course when related to a specific course.
Plagiarism in a graduate thesis or dissertation.	Expulsion from the university when discovered prior to graduation; revocation of degree when discovered subsequent to graduation.***	Expulsion from the university when discovered prior to graduation; revocation of degree when discovered subsequent to graduation.***

*Assuming first offense; **Exam, quiz, tests, assignments or other course work; ***Applies to graduate students