

# AME 511 Syllabus - Spring 2016

[Last updated: October 12, 2015]

Thursdays 6:40-9:20 pm in OHE 132.

**Instructor:** Prof. Veronica Eliasson, [eliasson@usc.edu](mailto:eliasson@usc.edu).

**Office hours:** Tue/Thu 2-4pm

**Office phone:** 213-740-7182

**TA:** TBA

**Textbook:** John D. Anderson, Modern Compressible Flow, 3rd Ed. McGraw-Hill, Inc.

## Grading:

20% Homework

35% Midterm

45% Final Exam

All exams are open book, open notes.

**Homework policy:** Late homework will only be accepted in reasonable situations (i.e. ask if you are unsure). Otherwise, no late homework will be accepted. However, at the end of the course, the homework with the lowest score will be dropped from grading. Note, only **one** HW will be dropped from the grading.

*Note: You are allowed to discuss the homework assignment with other students, but you should write it down on your own in your own words. You should not hand in a copy of somebody else's assignment.*

## 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](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.

## 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://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us>. This is important for the safety 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 [sarc@usc.edu](mailto:sarc@usc.edu) describes reporting options and other resources.

Lecture	Day	Suggested Reading	Homework
1	01/14	Continuity equation; Euler equation; principles of classical thermodynamics. Ch: 1.1-1.7, 2.1-2.5	
2	01/21	Energy equation; enthalpy and entropy equation; adiabatic and isentropic processes. Ch: 1.4.2-1.4.6, 2.6-2.8	
3	01/28	One-dimensional compressible flow; speed of sound; Mach number critical and stagnation conditions; normal shock relations Ch: 3.1-3.6, 3.10, 3.11	HW1 Due
4	02/04	Oblique shocks; reflections of shocks at rigid boundaries and shock interactions. Ch: 4.1-4.11	HW2 Due
5	02/11	Expansion waves; Prandtl-Meyer relation; shock-expansion procedure. Quasi-one-dimensional flows in converging-diverging ducts. Nozzles; choked flow; overexpanded and underexpanded nozzles. Ch: 4.14-4.17, 5.1-5.10,	HW3 Due
6	02/18	Nozzle example continued. Moving shocks. Ch 5, 7.1-7.3	HW4 Due
7	02/25	Reflected shocks, shock tube relations. Ch 7	HW5 Due
8	03/03	Midterm: 6:40-8:40pm (Location: TBA)	
9	03/10	Differential form of conservation equations, Velocity potential equation. Ch: 6, Ch8	
10		Spring break!	
11	03/24	Linearized flow; Method of characteristics 3-week project: to be announced. Ch: 9, 11	
12	03/31	Transonic flow, Physical properties of hypersonic flow; hypersonic shock relations Ch 14, Ch: 15	
13	04/07	Physical properties of hypersonic flow; hypersonic shock relations Forces on bodies in hypersonic Ch 14-15	
14	04/14	Statistical thermodynamics of high-temperature gases; translational, rotational, vibrational degrees of freedom; dissociation. Ch: 11, 15, 16	Project Due
15	04/21	Chemical reactions; gases in statistical nonequilibrium. Ch: 16	HW6 Due
16	04/28	Flows of high temperature gases Ch. 17 + Review	HW7 Due
17		Final date/time: TBA, Location: TBA	