MAE 122: Flow and Transport in the Environment
Fall Quarter, 2018

Instructor: Geno Pawlak
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Teaching Assistant: Andre Amador
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Class Schedule:
MW 9:00-9:50am PCYNH 122
F 8:00-9:50am PCYNH 122

Office Hours (tentative):
W F 10:00-11:00am EBU II 579 (Pawlak)
M 10:00-11:00am, location TBD (Amador)
T: 12:00-1:00pm EBU2 305 (Amador)
Th: 4:00-5:00pm EBU2 305 (Amador)

Course Website:
https://sites.google.com/a/eng.ucsd.edu/ucsd-mae-122
https://tritoned.ucsd.edu (assignment submission)

Course Description:
Introduction to the air and aquatic environments. Buoyancy, stratification, and rotation.
Introduction to the atmospheric boundary layer. Advection and diffusion. Turbulent diffusion and dispersion in rivers and in the atmospheric boundary layer. Surface waves and internal gravity waves.

Primary References:
Course notes (class webpage: https://sites.google.com/a/eng.ucsd.edu/ucsd-mae-122/)
Cushman-Roisin, B., Environmental Fluid Mechanics
online at: http://engineering.dartmouth.edu/~d30345d/books/EFM.html
Socolofsky, S. A. and Jirka, G. H., Environmental Fluid Mechanics 1: Mixing and Transport Processes in the Environment
online at: https://ceprofs.tamu.edu/ssocolofsky/CVEN489/Book/Book.htm

Other References:
Fox, R.W., McDonald, A.T. and Pritchard, P.J., Introduction to Fluid Mechanics, Wiley & Sons
Grading:

- Homework 25%
- 2 x Midterms 35%
- Final Exam 40%

Midterms (tentative!):
- F 10/26, 8:00am
- F 11/16, 8:00am

Final:
- W 12/12, 8:00-11:00am (Location TBD)

Course Outline:

Intro and Review of Fluid Mechanics (~3 weeks)
- Intro to EFD
- Equations of Motion
- Diffusion
- Advection/Diffusion
- Intro to Turbulence: Reynolds averaging

Environmental Processes (~7 weeks)
- Surface waves
- Stratification in the Ocean/Atmosphere
- Thermals/Plumes/Jets
- Boundary Layers: Friction/Drag/Wind stress
- Open Channel Flow, Hydraulics, Hydraulic Jumps
- Environmental Applications

Students requesting accommodations for this course due to a disability must provide a current Authorization for Accommodation (AFA) letter issued by the Office for Students with Disabilities (OSD) which is located in University Center 202 behind Center Hall. Students should present their AFA letters to me (please make arrangements to contact me privately) and to the OSD Liaison (Sandra de Sousa - EBU2-Rm.169) in the department at least two weeks prior to an exam to ensure that accommodations may be arranged.

Contact the OSD for further information:

T: 858.534.4382
E: osd@ucsd.edu
W: http://disabilities.ucsd.edu