ATM 345: Atmospheric Thermodynamics and Dynamics

Instructor:
- Sultan
- Office Hours: Upon appointment via email or phone

Course Description:
- A quantitative introduction to the thermodynamical and dynamical processes of Earth's atmosphere. Topics include moist and dry thermodynamical processes, hydrostatic stability, external forces of atmospheric motion, equations of atmospheric motions on a rotating planet, coordinate transformations, and horizontal motions under balanced forces.

- Material will cover the basics of atmospheric thermodynamics, both dry and moist; review the basic mathematics needed for study of atmospheric dynamics; and finally some of the basics of atmospheric dynamics. This will provide the needed preparation to proceed on to more advanced courses in atmospheric physics, dynamics, and weather analysis.

  - Prerequisites: ATM 205; MAT 203 or MAT 205 or AMS 261; PHY 126/PHY 127 or PHY 132/PHY 134 or PHY 142; CSE 130 or ESG 111 or PHY 277
- 3 credits

Course Learning Objectives:
- Understand basics of atmospheric thermodynamics
- Learn how to distinguish between stable, unstable and neutral atmospheres.
- Practice with vector methods and differential equations applicable to atmospheric processes.
- Learn about the forces that determine wind speed and direction at various levels in the atmosphere

Course Requirements:
- Read assigned text material.
- Turn in assigned homework on time.
- Takes scheduled quizzes and final examination.

Texts:
- Atmospheric Science – An Introductory Survey (2nd edition) by J. M. Wallace and P. V. Hobbs
  Publisher: Academic Press
  ISBN 13: 978-0-12-732951-2 (hardcover)
  ISBN 10: 0-12-732951-X (softcover)
Class Material:
- Wallace and Hobbs
  Chapters 1 and 3
- Martin
  Chapters 1-4

Grading
- Homework 30%
- Two classroom quizzes 40%
- Comprehensive Final Exam 30%

Class Resources:
- Blackboard

Academic Integrity: Each student must pursue his or her academic goals honestly, and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Any suspected instance of academic dishonesty will be reported to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at http://www.stonybrook.edu/uaa/academicjudiciary/.

Critical Incident Management: Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures.

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Students who require assistance during emergency evacuation are encouraged to discuss their needs with teaching staff and Disability Support Services. For procedures and information go to the following website: http://www.sunysb.edu/ehs/fire/disabilities.shtml.