DETAILED COURSE DESCRIPTION

COURSE: FCH 399 – Introduction to Atmospheric Sciences
3 Credit Hours – Fall Semester
3 Hours Lecture Per Week
Prerequisite(s): General physics I, 1 year each of general chemistry and calculus
Co-requisite(s): General physics II

SCOPE:

1. Level of Instruction:
   a. FCH 399 is an undergraduate-level course intended to fulfill requirements for ESF undergraduate students

2. Relation to curriculum or to other ESF or Syracuse University courses:
   a. Satisfies elective requirements in atmospheric sciences for undergraduate students
   b. Satisfies the air quality subject area for the proposed Environmental Health curriculum.
   c. Satisfies the Earth and Atmospheric Systems Science curriculum.
   d. There is no comparable course at SU, and this course may enroll SU undergraduate students.

CATALOG DESCRIPTION

CATALOG DESCRIPTION (Please provide using the precise format to be included in the ESF catalog, please do not exceed 50 words)

FCH 399. Introduction to Atmospheric Sciences (3)

Atmospheric composition, mass and structure; solar radiation and the global energy budget; atmospheric moisture budget, cloud and precipitation; photolysis, gas-phase oxidation, aqueous chemistry, and gas-to-particle conversion; physical and chemical mechanisms driving environment phenomena such as acid rain, the greenhouse effect, the ozone hole, remote and urban air pollution, and haze.

Prerequisite(s): General physics I, 1 year each of general chemistry and calculus.
Co-requisite(s): General physics II

STUDENT LEARNING OUTCOMES:

Upon successful completion of this course the student should be able to:

1. Explain governing equations for mass, energy, entropy, and momentum.
2. Identify key chemical reactions that can change atmospheric chemical composition.
3. Explain physical and chemical driving mechanisms behind atmospheric phenomena.
4. Discuss issues of air pollution and climate change in a learned and scientific manner and
5. Gain basic knowledge for studies in atmospheric sciences.

MAJOR CONCEPTS OR METHODOLOGIES:

1. Atmospheric composition, mass and structure
2. Fundamental physics and chemistry governing the atmospheric composition and structure
3. Application of the fundamentals in explaining atmospheric phenomenon
RELATION TO CURRICULUM OR TO OTHER ESF OR SYRACUSE UNIVERSITY COURSES:

FCH 399 fulfills undergraduate general elective requirements. There is no comparable course at SU.

COURSE HISTORY:

This course has never been taught at ESF.
Last approved: never.
Date: April 25, 2011
Course Number: FCH399
Course Title: Introduction to Atmospheric Sciences

☑ New Course □ Changes in existing course (check all that apply):

☐ Prefix ☐ Description ☐ Shared Resources
☐ Number ☐ Pre-requisite(s) ☐ Course Format
☐ Credits ☑ Co-requisite(s) ☐ Content
☐ Title

This course meets the General Education standards in the following knowledge and skills area (check all that apply):

☐ American History ☐ Humanities ☐ Other World Civilizations
☐ The Arts ☐ Mathematics ☐ Social Sciences
☐ Basic Communication ☑ Natural Sciences ☐ Western Civilization

Prerequisites or co-requisite requirements:

☑ Prerequisites: General Physics I, 1 year each of General Chemistry and Calculus
☑ Co-requisites: General Physics II
Institutional Impact:

Anticipated Enrollment: 10 - 20 per semester

Technology and Classroom Resource Demands:

Electronic Multimedia Enabled Classroom

Computing Resources:

Library Resources:

Desk copies on reserve

Transportation Requirements:

Forest Properties or Field Practicum Facilities Required:
Health and Safety Considerations:

Conditions or situations present in association with the course? Yes / No

1. Will substances with any of the following properties be used during instruction: flammability, toxicity, corrosivity, reactivity, registered pesticide, legally controlled, or other characteristics with the potential to cause harm or injury? Yes / No

2. Will any physical hazards be present during instruction? (e.g., machines that need safety guards; razor blades or syringes; compressed gases, etc.). No

3. Will any biological hazards be present during instruction? (e.g., handling animals (rabies or hantavirus); cultures or stocks of infectious agents (fungal spores, viruses, bacteria, etc.). No

4. Will any radiation hazards be present during instruction? (e.g., radioisotopes, X-rays, ultraviolet rays, lasers, etc.). No

5. Will any electrical equipment that, due to its design, location, or method of use, pose any threat to safety during instruction? (Give considerable thought to electrical use outdoors, or any potentially wet location.). No

6. Will there be any personal safety issues related to the class? (e.g., due to time of day or location, at the end of any organized class exercise, will students be in danger of physical assault, etc.). No

7. Will any students be driving official state or research sponsored land or water vehicles during any class or instructional exercise? No

8. Will any type of personal protective equipment be necessary during class exercises? (e.g., hard-hats, eye/face protection, hearing protection, hand/foot protection, lab coat, visibility clothing, etc.) No

If the answer was “Yes” to any of the HEALTH AND SAFETY questions, please explain:

CATALOG DESCRIPTION (Please provide using the precise format currently used in the ESF catalog, please do not exceed 1000 characters):

FCH399: Introduction to Atmospheric Sciences (3)

Atmospheric composition, mass and structure; solar radiation and the global energy budget; atmospheric moisture budget, cloud and precipitation; photolysis, gas-phase oxidation, aqueous chemistry, and gas-to-particle conversion; physical and chemical mechanisms driving environment phenomena such as acid rain, the greenhouse effect, the ozone hole, remote and urban air pollution, and haze.