Syllabus
Creative Inquiry: Meteorological Impacts on the Energy Budget of the Thermosphere
(Physics 4990H)
Spring Semester 2014

Instructor
Prof. Jens Oberheide, 102B Kinard Lab, Dept. of Physics and Astronomy, Clemson University, Tel. 864-656-5163, Email: joberhe@clemson.edu

Class Hours
Hours Arranged.

Office Hours
Friday, 1:00 – 2:00 or on an as needed basis.

Prerequisite
None.

Required Text
Scientific literature provided by the instructor.

Course Outline
It is by now accepted by the atmospheric physics community that atmospheric tides originating from global-scale weather systems have a tremendous impact on the dynamics of Earth's thermosphere and ionosphere. This creative inquiry course will address a much less understood problem: How do the tides modulate volume emission rates of energy in the thermosphere and, consequently, how do tropospheric weather systems impact the energy budget of Earth's upper atmosphere? Towards this goal, photochemical modeling will be applied and compared to satellite observations, in order to identify and quantify the major coupling terms as a function of solar activity. Honors students will become familiar with the underlying theory, apply it to the real world problem by setting up a working computer code, and interpret the results at a scientific level. The course is organized along the principle that science and programming go hand in hand and should enhance each other.

Course Objectives
1. Advance to a general understanding of photochemical modeling in Earth's thermosphere.
2. Advance to a general understanding of tidal phenomena in the atmosphere.
3. Advance to a practical application by producing a working computer code.
4. Advance to a conceptual understanding how tropospheric weather impacts the space weather of the upper atmosphere.

Expectations
The student is expected to work hard on the problem and to spend the necessary hours to read the background literature and to get the model running.

Course Grades
At the discretion of the instructor depending on the progress made (33%). The student is expected to give a presentation about his/her results in the weekly atmospheric and space physics seminar (33%) and to turn in a write-up of his/her work at the end of the semester (33%).

Attendance Policy
See expectations.

Class Web Page
None.

Academic Integrity Policy
The Clemson University statement on academic integrity applies, as posted in the Graduate Announcements.

Disability Access Statement
It is University policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have disabilities. Students are encouraged to contact Student Disability Services to discuss their individual needs for accommodation.