Natural Environments: The Atmosphere
GE 101 – Spring 2007
Boston University

Dated January 5, 2007

Professor: **Ranga B. Myneni**
Office: Room 449 Stone Science Building (675 Commonwealth Avenue)
Phone: 617-353-5742
e-mail: rmyneni@bu.edu

Office Hours	
Tuesday	10:00-11:00 AM
Wednesday	02:00-03:00 PM
Thursday	11:00-12:00 Noon
Or by appointment	

Class (Lecture) Information		
Class Room	Kenmore Class Building (KCB) 101	
Class Times	Monday	11:00-12:00 Noon
	Wednesday	11:00-12:00 Noon
	Friday	11:00-12:00 Noon

Textbook: **Strahler and Strahler, Physical Geography: Science and Systems of the Human Environment, 3rd Edition**. The textbook is a special abridged version for GE101 (Available at the BU Bookstore). If you have a longer version, that is okay.

Course Description: This course provides an introduction to weather and climate. Topics to be covered include: controls of weather and climate, day-to-day variations in weather, severe storms, climates of the world, and climate change. The course is comprised of three lectures and one lab per week. There are no prerequisites. Attached is a detailed schedule outlining the lecture topics, readings, and other important dates. There will be nine lab exercises assigned over the course of the term that will serve to illustrate many of the concepts discussed in the lectures. Lab sessions will be held in STO 453. These exercises constitute an important component of the class (and your grade). **Attendance and timely submission of lab assignments is required.**

The course content consists of three main topical areas. In the first section we will cover the basic astronomical relationship between the Earth and the Sun, and examine how this relationship controls weather and climate systems. In the second section of the course, we will learn about the structure, properties, and functioning of the atmosphere emphasizing atmospheric circulation and weather phenomena. In the final section of the course, we will examine the nature of climate and the geographic variability of climates (globally), and discuss climate change and the key scientific issues relevant to this complex and

topical subject. At the end of the semester, you should have a basic understanding of how the atmosphere functions, what factors control day-to-day weather patterns, and the nature of climate change and global warming.

Exams: The ten quizzes will be randomly given in class, but usually no more than one quiz per week. Dates for the two midterms and the final are fixed. The midterms and the final are multiple choice type exams. Grades may be curved. The grading is as follows:

Grading	
Midterm 1	15%
Midterm 2	15%
Final	30%
Lab Exercises	30%
Quizzes	10%

Midterm 01 is on Part 01 (Lectures 02 through 11)
Midterm 02 is on Part 02 (Lectures 12 through 23)
Final is cumulative, that is, Parts 01, 02 and 03 (Lectures 02 through 32)

Teaching Fellows: Jingyun Wang (wjy@bu.edu) and Amy Sullivan (amsull@bu.edu or Sullivan.am@comcast.net)

Web Site: All important announcements, handouts, reading assignments, PowerPoint presentations, and quiz answers will be available on the internet at the following URL:

http://courseinfo.bu.edu/courses/07sprgcasge101_a1

This site also contains a Discussion Board and Chat Room where you can post questions and answers for your fellow students (as well as the TFs and myself). You can also send e-mail to myself, the TFs, or other students. In addition, you can submit home-work assignments via the web-site. **You should certainly check the web-site 3-4 times a week to keep abreast of any new class information.**

An alternate web site of this class for use by high school students is located at

http://cliveg.bu.edu/courses/ge101spring07/main.html

Prof. Myneni's web site is at http://cybele.bu.edu/

Important Policies:

1. All exams must be taken at the scheduled times. Makeup exams will only be given with a doctor's note or a note from the Dean. **No Exceptions**.

2. Attendance in lectures and in labs is required. You will need to produce a Doctor's note to justify absences from lectures and/or labs.

3. Labs will be due one week after assignment, except when special cases such as when holidays fall on lab days. Labs will be accepted up to one week late with a 50% penalty. **No exceptions**.

4. Policies regarding incomplete grades are dictated by the College. All aspects of College policy on academic conduct are described in the College Academic Code (handbooks are available in room CAS 105). All cases of suspected academic misconduct will be referred to the Dean's office.

5. The syllabus, course descriptions, and handouts created by Professor Myneni and the Teaching Fellows, and all class lectures and lab materials, are copyrighted by Boston University and Professor Myneni. Except with respect to enrolled students as set forth below, the materials and lectures may not be reproduced in any form or otherwise copied, displayed or distributed, nor should works derived from them be reproduced, copied, displayed, distributed without the written permission of Professor Myneni. Infringement of the copyright in these materials, including any sale or commercial use of notes, summaries, outlines or other reproductions of lectures, constitutes a violation of the copyright laws and is prohibited. Students enrolled in the course are allowed to share with other enrolled students course materials, notes, and other writings based on the course materials and lectures, but may not do so on a commercial basis or otherwise for payment of any kind. Please note in particular that selling or buying class notes, lecture notes or summaries, or similar materials both violates copyright and interferes with the academic mission of the College, and is therefore prohibited in this class and will be considered a violation of the student code of responsibility that is subject to academic sanctions.

Lecture/Lab/Exam Schedule for Spring 2007
(Jan-05-2007)

Week	Dates	Topic	Readings	Lab
1	Jan 17, 19	Class Overview Introduction	Chapters 1, 2	No Lab
2	Jan 22, 24, 26	Rotating Sphere Orbiting Sphere Energy and Radiation	Chapter 3, 4	Lab 1 Units & Conversions
3	Jan 29, 31, Feb 2	Radiation and Temperature Atmos-Surf-Energy Budget Patterns of Radiation	Chapter 4	Lab 2 Earth-Sun Relationships
4	Feb 5, 7, 9	Remote Sensing Temperature Regimes-01 Temperature Regimes-02	Chapter 4, 5	Lab 3 Earth's Radiation Balance
5	Feb 12, 14, 16	Feb 12: Review Feb 14: Midterm #1 Feb 16: Guest Lecture	-	No Labs
6	Feb 20, 21, 23	Moisture and Precipitation Lapse Rates Stability	Chapter 6	No Labs
7	Feb 26, 28, Mar 2	Clouds Pressure and Winds Atmospheric Circulation	Chapter 6, 7	Lab 4 Energy & Temperature
8	Mar 5, 7, 9	Winds Aloft Ocean Circulation ENSO	Chapter 7	Lab 5 Humidity & Clouds
9	**Mar 12, 14, 16**	**Spring Break**	**Spring Break**	**Spring Break**
10	Mar 19, 21, 23	ENSO Impacts Air Masses and Fronts Hurricanes and Tornadoes	Chapter 7, 8	Lab 6 Pressure & Stability
11	Mar 26, 28, 30	Mar 26: Review Mar 28: Midterm #2 Guest Lecture	-	None
12	Apr 2, 4, 6	Climate Classification Low Latitude Climates Mid Latitude Climates	Chapter 9, 10, 11	Lab 7 Weather Forecasting
13	Apr 9, 11, 13	High Latitude Climates Rad Forcing of Climate Chng Observed Chng & Variability	Chapter 11, Handouts	Lab 8 Paleoclimate
14	Apr 18, 20	Detection & Attribution Clim Change Projections	Handouts	None
15	Apr 23, 25, 27	Impacts and Adaptations Review Part-01 Review Part-02	Handouts	Lab 9 Global Change
16	Apr 30, May 02	Review Part-03 Guest Lecture	-	No Lab

Laboratory Section

Lab Packet:
Key, Friedl, and Anderson. 2005. GE101 Laboratory Manual. Available for purchase at the BU Bookstore.

Objectives:
The labs are designed to enhance understanding of concepts discussed in lecture. The format of the lab is typically a short talk/explanation by the TF, followed by a time period to complete the lab assignment. This is the students' opportunity to ask questions about the exercises. Working in groups is encouraged.

Lab Materials:
Each student should bring his/her lab packet and a calculator. It is helpful to bring to laboratory your textbook as a reference.

Laboratory Schedule:
The course syllabus outlines which weeks laboratory is held. Consult the syllabus and read the lab exercise prior to coming to laboratory.

Assignments:
Laboratory procedures and assignments are both outlined in the lab packet. Assignments are due one week after the lab session exercise, unless otherwise indicated by your TF.

Grading:
Each of nine lab assignments is weighted equally to comprise a final laboratory grade. This grade contributes 30% to your overall course average.

Late Policy:
Lab assignments will be collected at the beginning of the lab section. Assignments handed in at the end of class are considered one day late. Assignments may be handed in up to one week (7 days) late with a 50% penalty. That is, an assignment handed in one day late and one handed in 6 days late would both receive a 50% penalty. Labs handed in more than one week late will not be graded and will receive a grade of 0**. Note students must hand in lab assignments on the assigned due date at the beginning of the lab section.** In special cases where the due date has been changed (i.e. to accommodate holidays or other special circumstances), the change will be announced in lab and it is the responsibility of the student to be aware of these changes.

Attendance:
It is your responsibility to attend your assigned laboratory section. You may not attend another lab section without prior permission from the TF. Attendance is mandatory in order to collect important data/observations, and assignments will not be accepted from students who did not attend the session. Laboratory cannot be made-up, unless under the following extenuating circumstances:

1) Absence due to religious holidays. Notify your TF **PRIOR** to the holiday. **That week's assignment is still due at the normal time**, and it is the student's responsibility to arrange to have the assignment turned in on time. Arrangements will be made to attend another laboratory section.

2) Absence due to sickness. A medical note must accompany your assignment to avoid a late penalty. Arrangements will be made to attend another laboratory section.

3) Absence due to other extenuating circumstances. (e.g. jury duty, family emergency) will only be accepted with written documentation AND a note from the Dean's office. Every effort must be made by the student to inform your TF before the absence. Arrangements will be made to attend another laboratory section.

Academic Honesty:
All students are expected to complete assignments individually. We recognize that similar answers will arise when working in groups; **however identical assignments will be given a grade of zero** and reported to the department. All cases of academic misconduct will be referred to the Dean's Office. Data/observations handed in by students who miss laboratory are considered dishonest.