PGEOG 250 – Fall 2018
EARTH SYSTEMS SCIENCE I
Syllabus
Lecture and Laboratory
Lecture Instructor: Professor Randye Rutberg
Lab Instructor: Ms. Angelika Winner

CLASS SCHEDULE:
LECTURES: M/Th, 11:10 PM – 12:25 PM, Room 1022 Hunter North
LABS: Section 1: Monday, 10:10 AM – 11:00 AM, Room 1090B Hunter North
Section 2: Thursday, 9:10 AM – 10:00 AM, Room 1090B Hunter North

PROFESSOR RUTBERG CONTACT INFORMATION:
Office Department of Geography, Room1041 Hunter North
E-mail rrutberg@hunter.cuny.edu (*)
Tel. 212-772-5326
Office Hours: M/Th 11:10-12:10 & by appointment ***please make an appointment if possible***

Ms. Angelika Winner
Email: aw495@hunter.cuny.edu
Office: 1032 Hunter North
Office hours: by appointment

* **Note**: the best way to contact us is via email – (1) You must include the course name or number in your subject line (2) You must include your entire name in your email (3)We will try to answer all emails within 24 hours. Allow for a 48 hour delay on the weekends.

> ***Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice. Updates will be posted regularly on BlackBoard.***

COURSE DESCRIPTION AND OBJECTIVES
In this course we learn to think of our planet as a system. A system consists of several components that interact with each other, sometimes in very complicated fashions. The components of the earth system that we will consider include the atmosphere, the hydrosphere, the lithosphere, and the biosphere. While each of these components can, and should, be studied in more detail in separate courses, here we focus on interactions between them.

Broad Course Objectives

1. To introduce students to "systems thinking" in the context of the earth system. Systems-thinking is critical in all areas of study, and particularly in the fields of environmental studies and earth sciences.

2. To introduce students to quantitative analysis. In the lab portion of this course we will be introduced to some of the concepts necessary to study environmental systems in a quantitative

fashion. Labs are meant to provide students with a number of identifiable skills that can be applied in other courses as well as in work environments.

3. To provide students with a sufficiently broad, yet integrated, understanding of the earth system to identify particular areas or sub-disciplines that they would like to pursue in more detail.

EXPECTED LEARNING OUTCOMES

1. *Theory*

At the end of the semester, students would be expected to:

- Describe and calculate the Earth's energy balance
- Describe the circulation and properties of the solid and fluid components of the Earth System
- Explain how various Earth processes function together to determine and regulate Earth's climate
- Describe the role of the carbon cycle in the Earth's climate system.
- Experience how these processes are incorporated into numerical models to investigate how the Earth system may respond to a given forcing

2. *Skills*

At the end of the semester, students would be expected to have acquired basic quantitative skills that will allow them to

- use basic mathematical calculations to quantify physical processes under study
- understand the importance of data visualization and explain graphs and charts in detail
- use basic computer software such as EXCEL to perform calculations and generate charts
- gain a basic appreciation of modeling environmental systems through the use of the STELLA software

COMPUTER LABS

Computer labs will be held once per week in room 1090B Hunter North. Labs will consist of exercises designed to introduce students to some of the concepts and skills necessary to study environmental systems in a quantitative fashion. These include basic mathematical concepts, as well as using computer simulations, or models, to understand the earth from a "systems dynamics" perspective. STELLA® modeling software will be used in modeling exercises. No previous experience in computer modeling or STELLA software is expected, although basic familiarity with the Windows operating system, MS WORD and MS EXCEL, is expected. Computer labs will be provided to you.

Most labs take two weeks. Labs must be emailed to the professor before the beginning of the next lab.

Group work – is allowed for labs when specified by the instructor. For these labs, discussions and consultations are allowed but the work MUST be individual. If students choose to work in groups, students must: (1) inform the professor which students are working together; and (2) hand in INDIVIDUAL lab reports, written in the student's own words and style.

Group work is strongly encouraged for the PS #1 and other problem sets as specified by the instructor.

PREREQUISITES
Each student must have passed at least one 100-level science course, or have permission of the instructor. Basic familiarity with the Windows operating system, and Microsoft Word and EXCEL, are assumed. Students will be taught to use additional software for running computer simulations in the laboratory.

REQUIRED TEXT BOOKS
Students must obtain their own copies of:
Kump, Kasting, and Crane, 2009 *The Earth System*, ***[IBNS-10: 0-32-159779-6; IBNS-13: 978-0-32-159779-3]*** (either 2nd edition or 3rd edition is acceptable), Pearson / Prentice Hall Publishers. This book has been posted on the new online Hunter Bookstore.

Bryson, Bill, *A Short History of Nearly Everything*, Broadway Books, 2004,
ISBN10: 076790818X

ADDITIONAL READINGS AND LAB MATERIAL will be provided, including lab exercises that have been designed specifically for this course

GRADES
Grades are based on lab work, two midterm exams, one final exam, and four low-impact assignments (two labs and two written).

Labs	30%
Exams	50% (2 midterms (@15%e each) & a final (@20%)
Assignments	20%

Class participation up to 1/3 letter grade extra credit.

Attendance in lecture and lab is required. If you miss lecture or lab it is your responsibility to obtain the notes, assignments and any other pertinent information disseminated in class.

ASSIGNMENTS
Group work is encouraged. Assignments will not be accepted late. If you experience extenuating circumstances, you must contact me within 24 hours of the due date of the assignment to discuss course of action.

All assignments must be handed in via BB. A hard copy must be submitted on the due date as well.

When submitting your assignments electronically, the document name must have the following format:

Lastname_firstname_assignmentname_ESS2017.doc
Example:

Rutberg_Randye_HW#1_ESS2017

This naming rubric helps me keep track of student work. If you do not name your documents as specified above, I do not guarantee that they will be graded.

In addition, within the document itself, you must include your full name, assignment title and any other students with whom you worked. All work must be presented in a clear and professional manner. If I cannot read it, I cannot grade it.

EXAMS
The exams will be based on the material covered in class, in the textbook and concepts that are learned through the lab portion of the course. The exam dates are CLEARLY posted in the syllabus of the course. The dates are set from day one and cannot be changed. Three exams will be given, two in-class midterm exams and one final exam. See the syllabus for exam dates and information about which chapters will be covered. The exams will be hand written (i.e. no scantrons). You must write legibly. If I can not read it, I can not grade it. If this is an issue, see me.

About examinations and grades:

a) Grades follow Hunter's grading system: http://catalog.hunter.cuny.edu/content.php?catoid=15&navoid=1433
b) Examinations are 1 hour and 15 minutes for the mid-term and 2 hours for the final exam and must be turned in promptly. If you arrive late, you lose that time.
c) Make-up exams are ONLY available in extreme cases, and with medical (or other) forms that confirms the absence. If you miss an exam and have a D or F average in the course at that point, you fail the course irrespective of the reason you missed it.
d) I will automatically agree to the CR-NCR option only if the conditions stated in the CR-NCR form are satisfied: all course work has been completed and you earned grades such that you accumulate at least 50 points total in the course (this includes labs+exams, if you earned any). Students on probation are not eligible for this option. Students must make an appointment to discuss this option with me at least one week before the final exam.

Tardiness in handing in labs:
Lab grades will be reduced by one letter grade per week.

Classroom policies: You are expected to have read the reading listed for each class day *before class on that date*. There is no texting permitted in the classroom. Laptops (and other tablets) are not necessary and are strongly discouraged in class.

HELPFUL INFORMATION

My Teaching Philosophy:
My goal in teaching is to help students learn the material and become responsible professionals. I also strive to share my enthusiasm for this subject. My approach to teaching involves conveying key information and concepts as well as encouraging discourse in the class room. Student participation greatly enhances the classroom environment. I understand and respect

individual differences in learning and do my best to promote learning in the classroom by working with individual differences rather than against them. At the same time, I wish to impart technical skills and a sense of responsibility by encouraging students to play the role of professionals in the classroom.
I expect students to put their best effort in this course. This involves participating in the in-class exercises, reading the assigned material, doing the homework, editing when necessary until they are clear and correct, and preparing for quizzes and exams.

Lecture: I will spend part of the lecture time explaining the key concepts of earth systems and earth science and discuss, when appropriate, solution of problems. You are expected to devote time outside the classroom to understand the concepts, and review questions given at the end of chapters in the textbook, or questions that I may ask in class. I expect that lectures will give you a clear idea of what is expected in quizzes and exams. (note: as a general rule of thumb for a college level course, you are expected to spend three hours outside the classroom for each hour in the class room.) I will periodically give "pop quizzes" to encourage you to read the assigned chapter before coming to class (grades will be factored into the "Assignments" category. I plan to focus a portion of the lecture on some of the more sophisticated concepts from the text book. It is your responsibility to read the entire chapter and meet the learning objectives. Ideally, you will complete your reading of the assigned chapter before the class meets so that class time can be used for higher level discussion.

Finally: It is important to start with a good study habit. Consistency is the key. Forming study groups is extremely helpful. Use my time and any resource available to you throughout the semester. Make progress steadily as the material in this course cannot be understood the night before the exam. Concentrate on understanding rather than 'regurgitating'. Put out your best effort everyday!

The following are useful tips to do well in this or any class:

- Attend class & take detailed notes.
- Read the assigned material in the text (or other) ***before*** coming to class. Take notes and record questions you would like to ask in class.
- Re-write your notes as soon as possible after class. This will allow you to fill in the details still fresh in your memory, and prepare questions for the next time the class meets.
- Test yourself by answering the questions in the book and in class.
- Carefully study the diagrams and charts in the book and in the lectures.

As with all courses at Hunter College:

- As per CUNY, an **Unofficial Withdraw (WU)** is assigned to students who **attended a minimum of one class**. It is important to understand the definition of a WU and the difference between this grade and an F grade. The conditions for assigning the WU grade include:
  1. A student's enrollment has been verified by the course instructor, and
  2. The student has severed all ties with the course at any time before the final exam week and, consequently, has failed to complete enough course work -- as specified in the course syllabus -- to earn a letter grade, and

3. The student has not officially withdrawn from the course by completing the process for a W grade, or made arrangements to receive an INC.

Academic Dishonesty: Please be advised that plagiarism, dishonesty, or cheating in any portion of the work required for this course will be punished to the full extent allowed according to Hunter College regulations.

Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The College is committed to enforcing CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures.

See the following report by the Hunter College Senate for more details: http://www.hunter.cuny.edu/senate/assets/Documents/Hunter%20College%20Policy%20on%20Academic%20Integrity.pdf

ADA Policy

In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical, and/or Learning) consult the Office of AccessABILITY, in Room E1214B, to secure necessary academic accommodations. For information and assistance: (212)772-4857 or (212)650-3230.

Hunter College Policy on Sexual Misconduct

In compliance with the CUNY Policy on Sexual Misconduct, Hunter College affirms the prohibition of any sexual misconduct, which includes sexual violence, sexual harassment, and gender-based harassment retaliation against students, employees, or visitors, as well as certain intimate relationship. Students who have experienced any form of sexual violence on or off campus (including CUNY-sponsored trips and events) are entitled to the rights outlined in the Bill of Rights for Hunter College.

Sexual Violence: Students are strongly encouraged to immediately report the incident by calling 911, contacting NYPD Special Victims Division Hotline (646-610-7272) or their local police precinct, on contacting the College's Public Safety Office (212-772-4444)

Other Forms of Sexual Misconduct: Students are also encouraged to contact the College's Title IX Campus Coordinator, Dean John Rose (jtrose@hunter.cuny.edu or 212-650-3262) of Colleen Barry (colleen.barry@hunter.cuny.edu or 212-772-4534) and seek complimentary services through the Counseling and Wellness Services Office, Hunter East 1123.

Comment [DR1]: I've sent out emails about this address. Please make corrections in all future syllabi, please.

CUNY Policy on Sexual Misconduct Link: http://www.cuny.edu/about/administration/offices/la/Policy-on-Sexual-Misconduct-12-1-14-with-links.pdf

PGEOG 250 – Fall 2017 ESSI
Additional Information

Chapter Titles for Second and Third editions of text book. Note that the course schedule is based on the third edition.

Titles listed in red are different for the two editions

PG250 (ESS 1) GOES THROUGH CHAPTER 8 ONLY.

SECOND EDITION	THIRD EDITION
1. Global Change	1. Global Change
2. Daisyworld: An Introduction to Systems	2. Daisyworld: An Introduction to Systems
3. Global Energy Balance: The Greenhouse Effect	3. Global Energy Balance: The Greenhouse Effect
4. The Atmospheric Circulation System	4. The Atmospheric Circulation System
5. The Circulation of the Oceans	5. The Circulation of the Oceans
6. Modeling that Atm-Ocean System	6. The Cryosphere
7. Circulation of the Solid Earth: Plate Tectonics	7. Circulation of the Solid Earth: Plate Tectonics
8. Recycling of the Elements	8. Recycling of the Elements
9. Focus on the Biota: Metabolism, Ecosystems and Biodiversity	9. Focus on the Biota: Metabolism, Ecosystems and Biodiversity
10. Origin of the Earth and of Life	10. Origin of the Earth and of Life
11. Effect of Life on the Atmosphere: The Rise of Oxygen and Ozone	11. Effect of Life on the Atmosphere: The Rise of Oxygen and Ozone
12. Long-Term Climate Regulation.	12. Long-Term Climate Regulation.
13. Biodiversity Through Earth History.	13. Biodiversity Through Earth History.
14. Pleistocene Glaciations.	14. Pleistocene Glaciations.
15. Short-Term Climate Variability	15. Global Warming, Part 1: The Scientific Evidence.
16. Global Warming	16. Global Warming, Part 2: Impacts, Adaptation, and Mitigation
17. Ozone Depletion.	17. Ozone Depletion.
18. Human Threats to Biodiversity.	18. Human Threats to Biodiversity.
19. Climate Stability on Earth and Earth-Like Planets.	19. Climate Stability on Earth and Earth-Like Planets.

PGEOG 250 – ESSI, Fall 2017: COURSE SCHEDULE ***** professor reserves right to change schedule if necessary *****

Reading refers to "The Earth System", 3rd edition. "Bryson" refers to "A Brief History of Nearly Everything"

Date	Day	Subject	Reading	Lab	HW	Bryson Chapter
8/27	M	Intro – Ch1	Intro – Ch1	Lab 1		
8/30	Th	Ch 3	Intro – Ch3	Lab 1		1
9/5	W	Ch 3		Lab 1		
9/6	Th	Flex Time	Ch 3	Lab 1		2
9/13	Th	Ch 2	Ch 3	Lab 2		
9/17	M	Ch2	Ch 2	Lab 2	HW 1 Due	3
9/20	Th	Review	Ch2	Lab 2		
9/24	M	Exam 1 –Ch 1 & 2		Lab 2		4
9/27	Th	Ch 4		Lab3		
10/1	M	Ch 4	Ch 4	Lab 3		5
10/4	Th	Ch 4	Ch 4	Lab 3		
10/11	Th	Ch 5	Ch 4	Lab 4	HW 2 Due	6
10/15	M	Ch 5		Lab 3		
10/18	Th	Ch 5	Ch 5	Lab 4		7
10/22	M	Ch 6	Ch 5	Lab 4		
10/25	Th	Ch 6	Ch 5	Lab 5		8
10/29	M	Ch 6	Ch 6	Lab 5		
11/1	Th	Review	Ch 6	Lab 5	HW 3 Due	9
11/5	M	Exam 2 – Ch 4,5,6	Ch 6	Lab 5		
11/8	Th	Ch 7		Lab 6		10
11/12	M	Ch 7		Lab 6		
11/15	Th	Ch 7	Ch 7	Lab 6		11
11/19	M	Ch 8	Ch 7	Lab 6		
11/26	M	Ch 8	Ch 7	Lab 8		12
11/29	Th	Ch 8	Ch 8	Lab 8		
12/3	M	Ch 8		Lab 8		13
12/6	Th	Flex time TBA	Ch 8	Lab8	HW 4 due	
12/10	M	Review	Ch 8	Lab 8		14
Final Exam	TBA					