

**Department of Earth and Atmospheric Sciences**

**City College of New York, CUNY**

**160 Convent Avenue, Marshak 106**

**New York, NY 10031**

**Course Syllabus Spring 2018**

**EAS 21700 System Analysis of the Earth**

EAS 21700-BC (23330) EAS 21700-BC2 (23364)

Days & Times Tuesdays & Thursdays, 9 am – 10:15 am

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Instructor Angelo Lampousis, Ph.D., Lecturer

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Office Hours Right after class or by appointment

**Lecture Instructor**: Angelo Lampousis, Ph.D.

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**Lab Instructors**: Stephanie Devries (sdevries@ccny.cuny.edu)

Katherine Jensen (kjensen@ccny.cuny.edu)

**Tutor**: TBA

**Office Hours**: Right after class or by appointment

**Course overview**: Analysis and modeling of the grand cycles and systems in the Earth Sciences, including plate tectonics and climate change, by incorporating the underlying physical, chemical and biological principles. Physical and chemical properties of earth materials are examined.

**Required Textbook**:

EAS 21700 System Analysis of the Earth, Published by Pearson (2016) Book ISBN: 9781269508292. This is a custom made edition consisting of six select chapters from the book “The Nature and Properties of Soils” by Ray R. Weil, Nyle C. Brady (15th Edition). The full edition is available on reserve at the Science Marshak Library.

The custom made edition is available as a hard copy through the CCNY Bookstore or may be delivered online via Pearson Collections. In order to access the online version, click on the link below to purchase your access for $17.94. You will be prompted to create a Pearson user account. If you already have a Pearson user account, sign-in with your username/password; if you do not, you will need to create a Pearson account prior to purchasing the course materials. <https://collections.pearsoned.com/#purchaseebook/1269508318>

**Recommended Textbook**:

The Blue Planet Author: Brian J. Skinner, Publisher: Wiley 2011. ISBN 978-0-471-23643-6. This textbook is available at the CCNY bookstore as well as large book retailers. There is also an electronic version that can be purchased and viewed via a tablet app. Used copies are acceptable. This textbook was used in the prerequisite course EAS 10600 Earth Systems Science or EAS 10610 Earth Systems Science and Engineering. It will be used again to provide context for the lecture discussions.

**Recommended Soil Survey Manual:**

Soil Survey Manual (issued March 2017), C. Ditzler, K. Scheffe, and H.C. Monger (eds.). USDA Handbook 18. Soil Science Division Staff. Government Printing Office, Washington, D.C. Publicly available:

https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/soils/ref/?cid=nrcs142p2\_054262

**Learning outcomes**:

* Develop knowledge of common techniques used for studying the Earth’s interior structure
* Ability to recognize the tectonic associations of common minerals and rocks, and their role in the development of soils
* Ability to appreciate the complexity of a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, political, ethical, health and safety, and sustainability
* Ability to conduct experiments, as well as to analyze and interpret data using software

(e.g., EXCEL and STELLA)

* Ability to function on teams and to communicate effectively scientific results

**Grading**: The overall grading for this course will be based on the following formula:

* Lab exercises 35%
* Lecture Quizzes / Assignments / Attendance / Participation 10%
* First exam 15%
* Second exam 15%
* Final exam 25%

**TENTANTIVE LECTURE CALENDAR & CONTENT**

|  |  |  |  |
| --- | --- | --- | --- |
| **Week** | **Day** | **Date** | **Topic** |
|  |  |  | **A Systems Perspective on Earth Science** |
| 1 | Tuesday | 30-Jan | Course introduction |
|  | Thursday | 1-Feb | Introduction to earth systems modeling |
| 2 | Tuesday | 6-Feb | Formation and age of the Earth |
|  | Thursday | 8-Feb | Earth’s basic structure and heat transfer |
| 3 | Tuesday | 13-Feb | Deadline: Project Drawdown (www.drawdown.org) Preliminary Student Presentations |
|  | Thursday | 15-Feb | Petrology / Petrography – continued |
|  | Tuesday | 20-Feb | Classes to follow a Monday schedule |
| 4 | Thursday | 22-Feb | Decomposition of rocks - intensity and rate of weathering  Deadline: Project Drawdown Reports Due Date (9 am) |
|  | Tuesday | 27-Feb | Landforms and landscapes |
| 5 | Thursday | 1-Mar | Weathering products and weathering-controlled landforms |
|  | Tuesday | 6-Mar | Review |
| 6 | Thursday | 8-Mar | First Exam |
|  |  |  | **Soils - CCNY/Pearson Custom Edition by Ray R. Weil, Nyle C. Brady, 15th Ed** |
|  | Tuesday | 13-Mar | The Soils Around Us - Chapter 1 |
| 7 | Thursday | 15-Mar | Formation of Soils from Parent Materials - Chapter 2 |
|  | Tuesday | 20-Mar | Continued |
| 8 | Thursday | 22-Mar | Soil Architecture and Physical Properties - Chapter 3 |
|  | Tuesday | 27-Mar | Continued |
| 9 | Thursday | 29-Mar | Soil Water: Characteristics and Behavior Chapter 4 |
|  |  |  | Spring Recess March 30 - April 08 |
|  | Tuesday | 10-Apr | Second Exam |
|  |  |  | **Systems** |
| 10 | Thursday | 12-Apr | Special Session: STELLA Tutorial |
|  | Tuesday | 17-Apr | Geographic Soils Information - Chapter 6 |
| 11 | Thursday | 19-Apr | Continued |
|  | Tuesday | 24-Apr | Systems behavior |
| 12 | Thursday | 26-Apr | Stocks and flows: The building blocks of system dynamics models |
|  | Tuesday | 1-May | Equilibrium diagrams and S-shaped growth |
| 13 | Thursday | 3-May | System Analysis of the Earth - Case Study |
|  | Tuesday | 8-May | System Analysis of the Earth - Case Study |
| 14 | Thursday | 10-May | System Analysis of the Earth - Case Study |
|  | Tuesday | 15-May | System Analysis of the Earth - Case Study |
|  |  | TBA | Final Exams May 18 – 24 |
|  |  |  |  |
|  |  |  | CCNY Spring 2018 Academic Calendar |
|  |  |  | <https://www.ccny.cuny.edu/registrar/spring-2018-academic-calendar> |

**Definition of Grades**:

All grades will be based on a scale of 100 with A+ = 97-100, A = 95-96, A- = 90-94, B+ = 87-89, B= 84-86, B- = 80-83, C+ = 77-79, C = 74-76, C- = 70-73, D = 60-69, and F<60.

A+= Rare performance. Reserved for exceptional achievement.

A = Excellent work. Outstanding achievement.

A- = Excellent work that exceeds course expectations.

B+ = Very good work. Solid achievement (expected of CCNY undergraduates) that meets all course expectations.

B = Good work. Acceptable achievement that meets almost all course expectations.

B- = Satisfactory work. Acceptable achievement that meets major course expectations.

C+ = Fair achievement just above that which is minimally acceptable.

C = Fair achievement but only minimally acceptable.

C- = Barely acceptable achievement.

D = Very low performance. Unsatisfactory work. Lowest achievement to still allow for a

passing grade. This grade may not be counted toward the major or minor option.

F = Failure

**Academic Integrity**: Academic integrity governs all aspects of academic work. Academic dishonesty is prohibited in the City University of New York, and is punishable by failing grades, suspension and expulsion. If a violation should arise, it will be reported for appropriate action. For more information, visit <https://www.ccny.cuny.edu/about/integrity>

Please read the summary below of “What behaviors constitute academic dishonesty?” (shared by Professor Peter Bower, Senior Lecturer, Barnard College, Columbia University – modified here).

**What behaviors constitute academic dishonesty?**

* **Cheating on examinations, quizzes, tests, or other assignments**: the giving of assistance to another or the receiving of assistance from another person, another examination paper, other written material, or any source not explicitly permitted by the instructor, is cheating. Thus, you may not look at another’s paper or answers; you may not show your paper or answers to another or leave your paper or answers around for others to look at; and, you may not verbally read or reveal your answers to another in any way. It is also cheating to have access, without the instructor’s approval, to examination, quiz, or test questions prior to the administration of the examination, quiz, or test.
* **Plagiarism**: the submission or presentation of ideas or work in any form that are not one’s own without appropriate acknowledgement of the source(s). Even with the acknowledgement, close paraphrasing can constitute plagiarism. You may quote the work of others if properly attributed. Close paraphrasing also requires attribution; close paraphrasing is, however, a gray area on a slippery slope, and the slope tends to become steeper and more slippery with the length of the paraphrase.
* **Submission of the same work for more than one course** without the explicit permission of the instructors involved.
* **Falsification or misrepresentation of data in any coursework**.
* **Altering, defacing, or concealing library materials**.
* **Participating in the academic dishonesty of another student** by offering assistance or advice that encourages such behavior.
* **Misrepresentation of one’s state of health or personal situation** to gain deferrals of examinations or extensions of academic deadlines.
* **Forgery of a signature** on any document or form related to a student’s academic life, including the adviser’s signature on a program, drop/withdrawal slip, or petition.

**Accommodations for students with disabilities**: The AccessAbility Center (AAC) facilitates equal access and coordinates reasonable accommodations and support services for City College students with disabilities. Visit: <http://www.ccny.cuny.edu/accessability/> for more information.

**Extra credit**: Since there are many opportunities in this course to academically perform, there will be no extra credit assignments.

**Email Policy**: The instructor reserves the right to not answer email communications that do not meet the following criteria:

(a) The student last name and course number must appear in the email subject line,

(b) Messages need to be signed with the full student name, department and major information,

(c) spell-check your messages and avoid language abbreviations common in online chatting and text messaging,

(d) use your CCNY email account in all communications.

**Make-up Quizzes**: No make-up quiz will be given without advance notification of at least one week before any absence due to religious observance. No make-up quiz will be given except for bonafide emergencies or illness. Except in the most unusual circumstances advance notification is required. An email or letter from your doctor is required before the scheduling of any make-up quiz. Also, except in the most unusual circumstances requiring special permission, the make-up quiz must be taken within one week of the missed quiz.

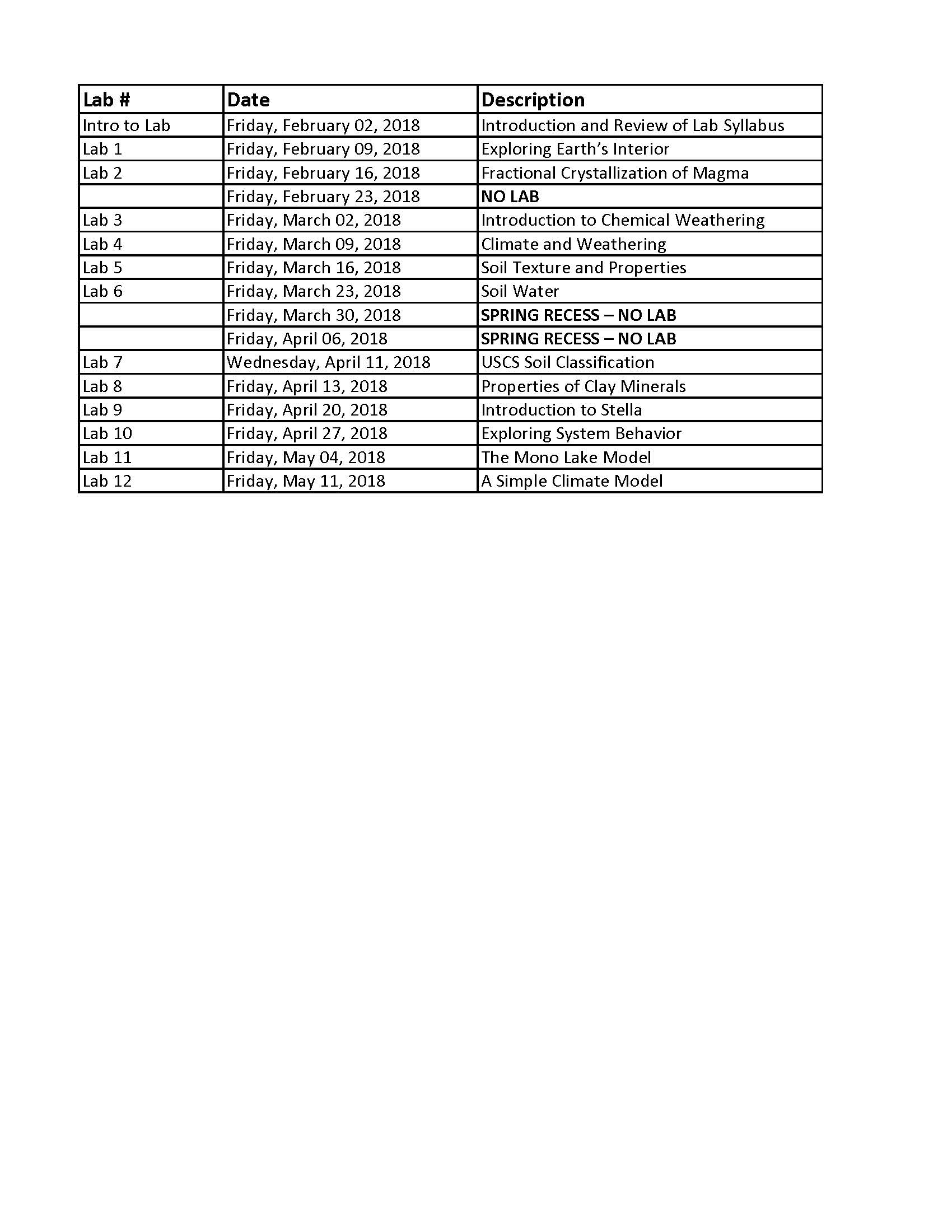
**Classroom Etiquette**: Every few years the behavior of several students compels me to remind the whole class of what may seem obvious to most: a) Talking during lecture is inconsiderate and disconcerting to me as well as to those trying to listen, think, and take notes. b) It is rude to walk in front of class (between the lecturer and the class) after class has begun. If you come in late quietly take a seat in the back half of the room.

**Syllabus Change Policy**: 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. Students will be informed promptly of any change through in-class announcements, Blackboard, and email communications.

**Schedule of Labs – Tuesday Section**

|  |  |  |
| --- | --- | --- |
| Lab # | Date | Description |
| Intro to Lab | Tuesday, January 30, 2018 | Introduction and Review of Lab Syllabus/Manual |
| Lab 1 | Tuesday, February 6, 2018 | Exploring Earth’s Interior |
| Lab 2 | Tuesday, February 13, 2018 | Fractional Crystallization of Magma |
|  | Tuesday, February 20, 2018 | **MONDAY SCHEDULE - NO LAB** |
| Lab 3 | Tuesday, February 27, 2018 | Introduction to Chemical Weathering |
| Lab 4 | Tuesday, March 6, 2018 | Climate and Weathering |
| Lab 5 | Tuesday, March 13, 2018 | Soil Texture and Properties |
| Lab 6 | Tuesday, March 20, 2018 | Soil Water |
| Lab 7 | Tuesday, March 27, 2018 | USCS Soil Classification |
|  | Tuesday, April 3, 2018 | **SPRING RECESS – NO LAB** |
| Lab 8 | Tuesday, April 10, 2018 | Properties of Clay Minerals |
| Lab 9 | Tuesday, April 17, 2018 | Introduction to Stella |
| Lab 10 | Tuesday, April 24, 2018 | Exploring System Behavior |
| Lab 11 | Tuesday, May 1, 2018 | The Mono Lake Model |
| Lab 12 | Tuesday, May 8, 2018 | A Simple Climate Model |
|  | Tuesday, May 15, 2018 | **NO LAB** |

**Schedule of Labs – Friday Section**

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