

GEOG/NIES 120

Introduction to the
Earth System

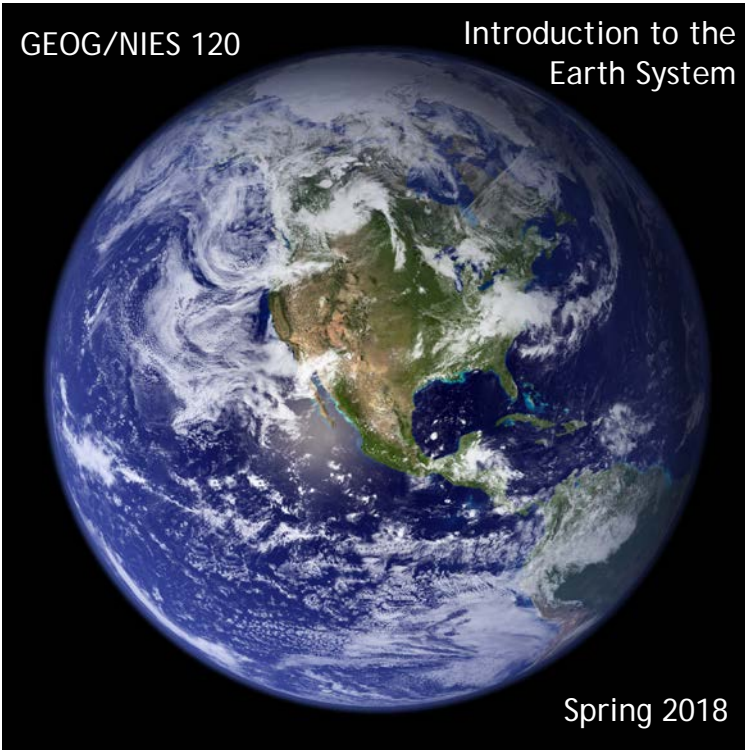


Image: NASA MODIS, <http://visibleearth.nasa.gov/view.php?id=57723>

Welcome to the Earth System. The Earth is the place where we live, the water that we drink, the air that we breathe, and the home to known life in the universe. The earth is a **system**, composed of many interacting subsystems: the atmosphere, hydrosphere, biosphere, geosphere, and anthrosphere. The earth is **dynamic**. We live in a swiftly changing world, characterized by rapidly changing climates, shifting landscapes, and growing human populations. Now, more than ever, it's essential to understand how the Earth system works, how it affects our livelihoods, and how we are altering the physical environment of our planet.

Geography/NIES 120 provides a critical foundation for students into how the Earth system works and what makes Earth livable. You will gain a deeper appreciation for the diverse processes that shape our local, regional and global landscapes. Many students take this course to fulfill their physical science requirement. Others use it as a gateway to majors and careers in Geography, Environmental Studies, and Environmental Science.

INSTRUCTORS:

Professor Ken Keefover-Ring, 115C Science Hall, ken.keefoverring@wisc.edu
Office Hours: Mondays 2:45-3:45 pm and Tuesdays 11:00-2:00 pm, or by appointment.

Laura Szymanski, 554 Science Hall, lszymanski@uwalumni.com
Office Hours: TBD, or by appointment.

TEACHING ASSISTANTS: Yi Wang (Head TA) and Catherine Schumak. See the Discussion Syllabus for their office hours and contact information.

FORMAT: Lecture 2 hours per week and discussion section 1 hour per week. Discussion sections elaborate the principal points of class lectures and discuss topics of student interest related to lecture material. See the **Canvas course web site** (<https://canvas.wisc.edu/courses/80382>) for lecture and discussion information.

LECTURE SECTION: Monday and Wednesday 11-11:50 am, Room: Ingraham 19

CREDITS: 3 credits in physical science. This class meets for three 50-minute class period each week over the fall/spring semester and carries the expectation that students will work on course learning activities (reading, writing, problem sets, studying, etc) for about 2 hours out of classroom for every class period. The syllabus includes additional information about meeting times and expectations for student work.

LEARNING OUTCOMES: By the end of this course, the student will be able to:

- Describe what the field of geography is and what physical geographers study
- Define an Earth systems approach to the study of physical geography
- Identify the basic physical principles and processes governing the circulation and characteristics of the atmosphere and of water on earth; earth's energy budget and climate
- Demonstrate knowledge about the basic principles and processes in global biogeochemical cycles and how humans have modified them
- Describe how recent technological advances have changed our view of Earth's history
- Summarize tectonic, fluvial, and glacial processes that shape the landscape

TEXT: *Physical Geography: The Global Environment, 5th edition*, Mason, Burt, Muller, and de Blij. 2015, Oxford University Press

EXAMINATIONS: Four 50-minute in-class examinations will be given at roughly 4-week intervals. The last exam will be on the last day of instruction. Each exam will stress the material covered since the previous exam. There is no final comprehensive exam during the end-of-semester examination week.

GRADING: The final grade will be determined from the cumulative points achieved on the class examinations and the discussion section. Each class exam will be worth approximately 30 points and the discussion section grade will count for 50 points. Discussion section points will be earned from worksheets and activities described on the syllabus provided by the TAs at the first section meeting. The potential total number of points for the course is 170.

DISCUSSION: Discussion section points are based on attendance (which is mandatory), in-class exercises and discussion participation and comprise 30% of your total grade. The schedule of discussion activities will be handed out in section. **NOTE:** Discussion sections will not meet until the week of September 11th, the first full week of instruction.

PREREQUISITES: There are no prerequisite courses for this class, but students are expected to be geographically literate. You should know the location of the world's continents and oceans, the location of the U.S. 50 states, and be able to read latitude and longitude on a map. Much of this information is included in the first few chapters of your textbook or in any student atlas.

HONORS: If you are registered for honors, please contact your TA early in the semester to discuss the project. The Honors projects are administered by the TAs.

EXTRA CREDIT: Extra credit is not offered.

ATTENDANCE: Attendance at class lectures is your responsibility; however, students who regularly come to class, take good notes and ask questions have greater success. We welcome questions and discussion during and after lecture and in our office hours. Please restrict laptop or other electronic device use during class time to the course and be aware that your activities on your computer can be distracting to your fellow students.

ACADEMIC MISCONDUCT: Instances of plagiarism, cheating, and other forms of academic misconduct have serious consequences for the students involved. To avoid any possibility of misunderstanding, you are strongly encouraged to consult the campus academic integrity web

page: students.wisc.edu/doso/acadintegrity.html. The documents referenced by this page contain explanations of what constitutes misconduct and related policies and procedures.

ADDITIONAL RESOURCES FOR STUDENTS:

- McBurney Disability Resource Center. We are happy to work with students who need additional accommodations. Please talk to one of the professors early on in the semester so we can best accommodate you. <http://www.mcburney.wisc.edu/>
- Multicultural Student Center. The MSC exists to make sure students of all backgrounds are successful at UW. <https://msc.wisc.edu>
- GUTS (Greater University Tutoring Service) tutoring. See their homepage to inquire about individual tutors/general tutoring sessions. <http://guts.studentorg.wisc.edu/>
- UW Writing Center. See their website for information about drop-in or scheduled appointments with expert writers. They will help with just about any type of writing assignments/needs. <http://www.writing.wisc.edu/>
- L&S Student and Academic Affairs. See their website for issues regarding medical absences and other emergencies that may affect your ability to attend courses and complete coursework. <http://saa.ls.wisc.edu>
- Any student facing food and/or housing insecurity and who believes this may affect their performance in the course, is urged to contact the Dean of Students for support: <https://doso.students.wisc.edu/student-assistance/>. Please notify one of the professors if you don't feel comfortable doing so, so they can help you access resources. As a student at the University of Wisconsin – Madison there are numerous resources available to you, including your Deans. Each student has two Deans, an **Academic Dean**, whose role is to assist students with academic matters pertaining to his/her/their respective School or College, and the Dean **of Students**, whose role is to assist students with personal matters.

Lecture Schedule – Spring 2018

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|---------|--|--------|--|
| Week 1 | W | Jan 24 | 1) Introduction to Geography and Earth System Science, Units 1-3 ^{1,2} |
| Week 2 | M | Jan 29 | 2) EMR, Earth-Sun Fundamentals, Unit 4, What If: Sunless Earth? https://what-if.xkcd.com/49/ |
| | W | Jan 31 | 3) Atmosphere Fundamentals, Composition, Structure, Unit 6 + pp 94-95, What If: Rising Steadily? https://what-if.xkcd.com/64/ |
| Week 3 | M | Feb 5 | 4) Earth's Energy Cycle, Unit 5 |
| | W | Feb 7 | 5) Earth's Energy Cycle and Temperature, Units 5, 7 |
| Week 4 | M | Feb 12 | 6) Atmospheric Forces and Motion, Unit 8, What If: Global Windstorm? http://on.mash.to/1tzdktj |
| | W | Feb 14 | 7) Atmospheric Moisture and Stability, Unit 11 + pp 84-86, What If: Raindrop: https://what-if.xkcd.com/12/ |
| Week 5 | M | Feb 19 | 8) FIRST EXAM – Covers Jan 24 to Feb 12 material |
| | W | Feb 21 | 9) Atmospheric Circulation, Unit 9 |
| Week 6 | M | Feb 26 | 10) Weather, Fronts, and Mid-latitude Cyclones, Units 12, 13 |
| | W | Feb 28 | 11) Ocean Structure and Circulation, Unit 10, What If: Drain the Oceans. https://what-if.xkcd.com/53/ |
| Week 7 | M | Mar 5 | 12) Water Cycle and Water Resources, Units 11, 38 |
| | W | Mar 7 | 13) Global Climate Change, Units 18,19 |
| Week 8 | M | Mar 12 | 14) SECOND EXAM – Covers Feb 14 to Mar 7 material |
| | W | Mar 14 | 15) Human Effects on Global Biogeochemical Cycles, Unit 20, Unit 24 |
| Week 9 | M | Mar 19 | 16) Soil Systems & Soil Forming Environments, Units 21-23 |
| | W | Mar 21 | 17) Characteristics of Earth's Surface and Interior, Units 27-29 |
| Week 10 | Mar 24-Apr 1 Spring recess – No classes | | |
| Week 11 | M | Apr 2 | 18) Earth's Tectonic Systems, Units 30-31 |
| | W | Apr 4 | 19) Volcanic and Earthquake Hazards, Units 32-34 |
| Week 12 | M | Apr 9 | 20) Weathering Processes, Units 35, 36, 42 |
| | W | Apr 11 | 21) THIRD EXAM – Covers Mar 14 to Apr 9 material |
| Week 13 | M | Apr 16 | 22) Mass-Movement Processes and Hazards, Units 36, 37 |
| | W | Apr 18 | 23) Fluvial Erosion and River Processes, Units 38-41 |
| Week 14 | M | Apr 23 | 24) Arid Systems, Units 35, 47 |
| | W | Apr 25 | 25) Glacier Landforms and Sediments, Units 43-45 |
| Week 15 | M | Apr 30 | 26) Responses of Glacier Systems to Climate Change, Units 46, 18, 19 |
| | W | May 2 | 27) FOURTH EXAM – Covers Apr 16 to Apr 30 material |

¹Unit 1 will be covered in lecture – you are expected to read Units 2-3 on your own and be responsible for this material.

²'Units' always refers to readings from the Mason et al. textbook