

**EAS 1600: Introduction to Environmental Science
(4 Credit Hours)
Fall 2020**

Course Lecture Meeting Times: Tues. & Thurs. 2:00 – 3:15 PM EDT
Course Lecture Location: BlueJeans Events (link on Canvas)

*****We will utilize Canvas announcements and messaging for all class communication*****

Instructor: Dr. Zachary Handlos
Email: zachary.handlos@eas.gatech.edu
Office Hours: By email appointment

Course TA: Rime El Asmar
TA Email: rasmar3@gatech.edu
TA Office Hours: By email appointment

Lab Coordinator: Heather Chilton
Email: htchilton@gatech.edu
Office Hours: By email appointment

*****Statement about Wearing Masks*****

Masks ARE REQUIRED on campus. There are no exceptions to this policy (unless otherwise discussed with the course instructor). If you attend class in-person without a mask, you will be asked to leave ASAP. Please contact the course instructor if you have any issues regarding access to a mask or regarding this policy.

*****COVID-19 Statement*****

If you are experiencing a fever (i.e., temperature over 100°F), cold-like symptoms, sore throat, dry cough, flu or any other type of illness, **DO NOT COME TO CLASS IN-PERSON.** Please inform the course instructor ASAP if you will miss class due to illness.

Please complete the following daily COVID-19 checklist every day prior to attending class in-person: https://health.gatech.edu/sites/default/files/images/daily_checklist.pdf. If you said “yes” to any of the checklist items, stay home or get off of campus ASAP.

If you test positive for COVID-19 and/or have COVID-19-like symptoms, please read the “If you Get Sick” section at this link here, and follow ALL directions:
<http://health.gatech.edu/coronavirus/campus-guidelines>

Introduction

Nearly all scientists have come to a consensus that Earth’s climate is changing and will continue to change in the future, and anthropogenic (i.e., human) activity is primarily responsible for these observed and predicted changes. Understanding Earth’s environment requires understanding how the whole Earth functions as a system. We will begin by considering external influences on Earth’s environment and reviewing the systems approach for studying interrelated phenomena, as well as the basic physics needed for such studies. We will then investigate four components of the Earth system in detail: the atmosphere, the oceans, the solid Earth, and the biosphere. We will explore how each component interacts with the others and how these processes control Earth’s climate. We will finish with a discussion of modern anthropogenic climate change. By the end of the course, students will understand the processes by which the dynamic Earth system operates and will be able to critically evaluate the various natural and anthropogenic influences on the environment. Through the laboratory sessions and lectures, students will develop an understanding of the scientific method, communicate scientific information to peers, analyze data, and implement ideas.

Course Topics

- Planetary Processes
- Atmosphere
- Hydrosphere
- Lithosphere
- Biosphere
- Chemical Cycles
- Climate

Course Materials:

Kump, L. R., Kasting, J. F., and Crane, R. G., (2010): The Earth System, 3rd Edition, Pearson; ISBN-13: 978-0321597793. (lectures primarily based off of this book; focuses more on the background science)

Sherman, D.J., and Montgomery, D.R., (2021) Environmental Science and Sustainability, 1st Edition, Norton, ISBN-13: 978-0393422108. (focuses more on the societal approach)

*****Canvas:** This course will make use of canvas to post lectures, post materials, and hold discussions.***

Grading:

Quizzes	Please see description below	25%
Labs	Average of lab scores	30%
Cumulative Final	Please see description below	15%
Participation	Online and In-Class participation activities	15%
Homework	Homework assignments will be announced in class	15%
Course total		100%

Quizzes: You will be required to complete 6 timed quizzes online via Canvas. The quiz format will be multiple-choice, multiple-answer and/or true/false questions. You will have 30 minutes to complete a quiz once started. Your lowest quiz score will be dropped.

Labs: See lab syllabus for more information about how your laboratory grade will be determined.

Cumulative Final Exam: The final exam in this course will be cumulative and assigned online during finals week. More details about this will become available later in the course.

Participation: Every 1-2 weeks, there will be a participation exercise. These exercises will vary between working on quiz practice problems to participating in online discussion forum assignments about current events or topics tied to this class. There will be 10 participation activities in total.

Homework: There will be 6 homework assignments, and question format will be short-answer. Length and time allotted to complete such assignments will be discussed in class. Your lowest homework grade will be dropped.

Grading Scale:

Grade	Percentage
A	100 – 90.0
B	89.9 – 80.0
C	79.9– 70.0
D	69.9 – 60.0
F	<60

Grade Curve: Depending on the distribution of student scores at the end of the course, the scores may be curved to reflect the scale described above (up to the instructor’s discretion).

Note: If taking this course as pass/fail, a “passing” grade requires achieving a C or higher.

Lecture Procedures & Policies:

Attendance: You are required to attend all lectures live online (unless otherwise discussed with the course instructor). If you cannot attend the lectures live due to ANY illness, family emergency, technical difficulties with internet or other emergency circumstance, we will make sure to record all lectures and post the recordings and lecture slides on Canvas.

Participation: Participation exercises will occur during live lectures. Unless you cannot attend lecture live due to ANY illness, family emergency, technical difficulties with internet or other emergency circumstance, no excuses will be allowed for missing participation assignments.

Communication: Communication regarding anything and everything related to this class will utilize Canvas announcements and messages. Please make sure that your Canvas messaging/announcements is linked to your Georgia Tech email account or that you are frequently checking your Canvas messages and the Canvas page. **It is your responsibility to read all messages, including ALL message content.**

Late Policy: For each day that an assignment is late, 10% of your total score will be deducted. If the assignment is more than 3 days late, a “0” score will be provided. Exceptions will apply (due to ANY illness, family emergency, or other emergency matters) with communication of at least 24 hours in advance of assignment due date.

Extra Credit: In fairness to all students, no extra credit will be offered.

Academic Honor Code:

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. The instructor, teaching assistants and students in this class, as members of the Georgia Tech community, are bound by the Georgia Tech Academic Honor Code. Please see <http://www.catalog.gatech.edu/policies/honor-code/> for Georgia Tech’s Academic Honor Code, which you are required to uphold.

Cheating will not be tolerated in this course. Cheating includes the following: 1) copying answers from another student, 2) using unauthorized resources to study for course quizzes and assessments, which includes the use of electronic devices, 3) posting solutions to course quizzes and other assignments on the Internet, and/or 4) any other activity that would be considered “academic misconduct”.

Students will be asked to acknowledge their acceptance of this stipulation and their willingness to abide by all terms of the honor code on all quizzes and the final exam. Any student suspected of cheating or plagiarizing on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty.

*****To summarize, do not cheat; it is not worth jeopardizing your future.*****

Access and Accommodations:

If you anticipate or experience physical or academic barriers based on disability, you are welcome to let me know so that we can discuss options. You are also encouraged to contact the Office of Disability Services to explore reasonable accommodations.

The Office of Disability Services can be contacted by:

Phone: **404-894-2563**

Email: dsinfo@gatech.edu

Website: <https://disabilityservices.gatech.edu/>

Resources:

Academic Support

- [Center for Academic Success](#)
 - [1-to-1 tutoring](#)
 - [Peer-Led Undergraduate Study \(PLUS\)](#)

- [Academic coaching](#)
- Residence Life's [Learning Assistance Program](#)
- [OMED Educational Services](#) - Group study sessions and tutoring programs
- [Communication Center](#) - Individualized help with writing and multimedia projects
- [Academic advisors](#) for your major

Personal Support

Georgia Tech Resources

- The [Office of the Dean of Students](#) | 404-894-6367 | 2nd floor, Smithgall Student Services Building; You also may request assistance [here](#)
- [Counseling Center](#) | 404-894-2575 | Smithgall Student Services Building 2nd floor
 - Services include short-term individual counseling, group counseling, couples counseling, testing and assessment, referral services, and crisis intervention.
 - *Students in crisis may walk in during business hours (8am-5pm, Monday through Friday) or contact the counselor on call after hours at 404-894-2204.*
- [Students' Temporary Assistance and Resources \(STAR\)](#)
 - Can assist with interview clothing, food, and housing needs.
- [Stamps Health Services](#) | 404-894-1420
- [OMED Educational Services](#) | 404-894-3959
- [Women's Resource Center](#) | 404-385-0230
- [LGBTQIA Resource Center](#) | 404 385 4780
- [Veteran's Resource Center](#) | 404-385-2067
- [Georgia Tech Police](#) | 404-894-2500

National Resources

- The [National Suicide Prevention Lifeline](#) | 1-800-273-8255
 - Free and confidential support 24/7 to those in suicidal or emotional distress
- The [Trevor Project](#)
 - Crisis intervention and suicide prevention support to members of the LGBTQ+ community and their friends
 - Telephone | 1-866-488-7386 | 24 hours a day, 7 days a week
 - [Online chat](#) | 24 hours a day, 7 days a week
 - Text message | Text "START" to 687687 | 24hrs day, 7 days a week

Date	Lecture #	Topic (s)	Kump Textbook	Sherman Textbook	Lab
Aug 18	1	Course Syllabus and Earth's "Spheres"	Ch. 1	Ch. 1	
Aug 20	2	Feedback Loops and Daisyworld	Ch. 2	Ch. 10 (10.1-10.2)	
Aug 25	3	Radiative Laws and Application	Ch. 3 (48-55)	Ch. 11 (11.1-11.2)	Lab 1: Math/Science Starter
Aug 27	4	Earth's Energy Budget and the Greenhouse Effect	Ch. 3 (48-55)	Ch. 11 (11.1-11.2)	
Sept 1	5	The "Reason for the Seasons" on Earth	Ch. 4 (60-75)	Ch. 8 (8.2)	Lab 2: Earth's Temperature <i>Exp 1 – Group 1</i>
Sept 3	6	Atmospheric aerosols and the ozone layer	Ch. 17	Ch. 8 (8.5)	
Sept 8	7	Weather and Climate Part 1: Atmospheric Basic State Variables and Laws and the Hadley Cell Circulation	Ch. 3 (44-48) Ch. 4 (58-63)	Ch. 8 (8.2-8.3)	Lab 3: Atmospheric Circulation <i>Exp 1 – Group 2</i>
Sept 10	8	Weather and Climate Part 2: Coriolis Effect and Atmospheric Circulation and Tropical Cyclones	Ch. 4 (63-67)	Ch. 8 (8.2-8.3)	
Sept 15	9	The Hydrologic Cycle and Latent Heating	Ch. 4 (70-82)	Ch. 7 (7.1)	Lab 4: Hydrology <i>Exp 2 – Group 1</i>
Sept 17	10	Oceanography Part 1: Ocean Basics and Properties	Ch. 5 (96-98)	Ch. 7 (7.1)	
Sept 22	11	Oceanography Part 2: Wind-Driven and Thermohaline Circulations	Ch. 5 (84-100)	Ch. 7 (7.1 and 7.7)	Lab 5: Oceans <i>Exp 2 – Group 2</i>
Sept 24	12	Oceanography Part 3: Biological Pump vs. Upwelling	Ch. 8 (157-159)	Ch. 7 (7.8)	
Sept 29	13	El Niño Southern Oscillation – where the atmosphere and ocean work together	Ch. 5 (92-96)	Ch. 7 (7.7)	None? <i>Exp 3 – Group 1</i>
Oct 1	14	Lithosphere Part 1: Basics and Plate Tectonics	Ch. 7 (122-143)	Ch. 9 (9.1)	
Oct 6	15	Lithosphere Part 2: Rocks vs. Minerals	Ch. 7 (143-146)	Ch. 9 (9.2-9.3)	Lab 6: Geosphere <i>Exp 3 – Group 2</i>
Oct 8	16	Soils and the Biosphere	Ch. 9 (176-188)	Ch. 9 (9.5-9.6)	
Oct 13	17	Carbon Cycle Part 1: Role of Photosynthesis vs. Respiration and Biological Pump	Ch. 8 (149-159)	Ch. 10 (10.5)	Lab 7: Soils and the Biosphere
Oct 15	18	Carbon Cycle Part 2: Ocean Acidification and Volcanoes vs. Rock Weathering	Ch. 8 (149-170)	Ch. 10 (10.5)	
Oct 20	19	Paleoclimate (i.e., Past Climate)	Ch. 14 (272-282)	Ch. 11 (11.1-11.2)	Lab 8: Carbon Cycle <i>Exp 4 – Group 1</i>
Oct 22	20	Finish Past Climate and Discuss Present Climate	Ch. 15	Ch. 11 (11.3)	
Oct 27	21	IPCC Report on Present and Future Climate	Ch. 15	Ch. 11 (11.4-11.5)	Lab 9: Climate
Oct 29	22	Finish Future Climate; Climate Change Statistics	-	-	<i>Exp 4 – Group 2</i>
Nov 3	23	Energy: Traditional vs. Alternative Energies	-	Ch. 13 and 14	City Council (wk 1)

Nov 5	24	Alternative Energies and Climate Change Mitigation	Ch. 16 (327-338)	“What Can I Do” sections throughout textbook	
Nov 10	25	Finish Climate Change Mitigation; Adaptation	Ch. 16 (327-338)	“What Can I Do” sections throughout textbook	City Council (wk 2)
Nov 12	26	Sustainability Case Studies in Atlanta, GA	-	-	
Nov 17	27	Finish Sustainability Case Studies; Having the “climate change” conversation with people	-	-	
Nov 19	28	Overflow Day or TBD	-	-	
Nov 24	29	Final Exam Review Session	-	-	
Dec 1		FINAL EXAM ONLINE – 2:40 PM Tuesday, December 1 st , 2020			

*course schedule is subject to change