EAS 1601: Habitable Planet
(4 Credit Hours)
Summer 2021

Course Lecture Meeting Times: Mondays & Wednesdays 9:30 – 11:40 AM EDT
Course Lecture Location: BlueJeans (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

Lecture TA: Charlotte Carl
TA Email: ccarl8@gatech.edu
TA Office Hours: By email appointment

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

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

If you are vaccinated: You are not required to wear a mask within campus buildings.

If you are **not** vaccinated: You are strongly recommended to wear a mask within campus buildings.

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*****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

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Introduction
We live in an exciting time, when the search for life beyond the Earth is advancing at incredible speed. With better and better spacecraft, we are searching our own solar system, and with better and better telescopes we are searching our galactic neighborhood. So what are we looking for, and how will we know when we find it? This course will explore the history of the solar system and the Earth as the one currently known example of a habitable planet—one that can support living organisms. We will consider how stars, elements, and planets form, the important planetary processes that brought about the Earth as it was when life arose, and the factors that shape the planet we live on today. This course is geared toward undergraduate students, and is meant to be both challenging and broadly accessible. The course will draw upon lectures and readings, as well as laboratory exercises to enrich those lessons.

Course Topics
Origins of the Universe, Stars and Planets
What Makes a Planet Habitable?
Exploring the Only Case Study of Habitability…Earth
Life and Evolution on Earth and Beyond
Detecting Habitable Planets

Recommended (<u>but not required</u>) Textbook:
Langmuir, C. and W. Broecker (2012): How to Build a Habitable Planet: The Story of Earth from the Big Bang to Humankind, 2nd Edition, Princeton University Press; ISBN-13: 978-0691140063.

*** This course will make use of Canvas to post all course materials. ***

Grading:

Quizzes	Please see description below	20%
Labs	Average of lab scores	25%
Cumulative Final	Please see description below	20%
Participation	Attendance (7.5%) and In-Class Participation (7.5%)	15%
Homework	Homework assignments will be announced in class	20%
Course total		**100%**

Quizzes: You will be required to complete 5 timed quizzes online via Canvas. The quiz format will be multiple-choice, multiple-answer, true/false and/or short answer questions. The amount of time allotted on the quiz will be announced prior to the start of the quiz in class. **<u>Your lowest quiz score will be dropped</u>**.

<u>**Since the lowest quiz is dropped, there are no make-up quizzes unless the instructor is notified prior to the start of the quiz (or if otherwise deemed OK by the instructor). The quiz cannot be completed for partial credit past its due date.**</u>

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: There are two components to this portion of your grade:

1) *Attendance*: Attendance will be taken in class and is worth 7.5% of your course grade. Your attendance grade will be updated periodically on the course Canvas website. You must be in attendance during the class live for 18 of the 20 class periods that we meet (i.e., you are allowed to miss no more than 2 classes).

   If you will be missing class due to illness, injury, COVID-19, family emergencies, etc… you must do the following to prevent losing attendance credit: 1) contact the Division of Student Life on campus about your absence so it is officially documented, and 2) contact the course instructor **before class starts** or ASAP.

2) In-Class Participation: In-class participation exercises will also be assigned and will be worth 7.5% of your course grade. The in-class exercises are to be completed during class.

Homework: There will be 5 homework assignments. 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.

Other Course Procedures & Policies
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 unless otherwise specified by the course instructor.

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, assignments, labs and the final exam. Any student suspected of cheating or plagiarizing 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)	Assignment Info	Lab
May 17	1	Introduction to the Universe and the Big Bang Theory (not the TV show)		Lab 1: Introduction/Getting Started and Math and Science Starter
May 19	2	The Creation of Matter and Stars		
May 24	3	Stars and Element Formation		Lab 2: Universe to Stars
May 26	4	Element and Molecule Formation	Quiz 1	
May 31	5	NO CLASS - HOLIDAY	NO CLASS - HOLIDAY	Lab 3: Properties of Stars
June 2	6	Planet Formation	Homework 1 Due	
June 7	7	The Habitable Zone – Where are these and how do we find them?		Lab 4: Forming Planets
June 9	8	The Solar System and Planetary Composition	Quiz 2	
June 14	9	Planetary Composition; Plate Tectonics and Other Neat Geoscience Topics	Homework 2 Due	Lab 5: Detecting Exoplanets
June 16	10	Planetary Atmospheres, Earth's Atmosphere and Climate System		
June 21	11	Earth's Energy Balance and the Greenhouse Effect		Lab 6: Planet Structure
June 23	12	Finish Greenhouse Effect	Quiz 3	
June 28	13	Understanding Past Climate – Earth as a Case Study	Homework 3 Due	Lab 7: Energy Balance
June 30	14	Finish Climate Material		
July 5		NO CLASS - HOLIDAY		

July 7	15	The Evolution of Life on Earth		Lab 8: Greenhouse Effect + Earth's Thermostat
July 12	16	Evolution and Extinction	Quiz 4	Lab 9: Habitability and Life
July 14	17	Finish Evolution and Extinction; Start Role of Humans on a Planet	Homework 4 Due	
July 19	18	Role of Humans on a Planet		Mission Proposal Project
July 21	19	Earth's Future; Perseverance Mission	Quiz 5	
July 26	20	Final Exam Review Session	Homework 5 Due	
July 30		FINAL EXAM	Complete the final exam online on Canvas anytime on this day – you'll have 2 hours 50 minutes to complete the exam	

***** Schedule subject to change *****