

**AST 248 (Fall 2023): Search for Life in the Universe (3 credits)**  
*(Detailed class & exam schedule in the last page)*

**Time & Location: TuTh (13:00-14:20) & Harriman Hall 137 (West campus)**

**Instructor: Prof. Jin Koda**

Office: Room 455, Earth and Space Sciences Building  
Email: jin.koda@stonybrook.edu  
Office Hours: To be announced or by appointment (email Koda)

**Teaching Assistant: Zhi Chen**

Email: zhi.chen.3@stonybrook.edu  
Office Hours: To be announced

**Course Description:** A study of the role of science in modern society through investigation of the question: Does/can life exist elsewhere in the universe? Topics include a review of the astronomical and biological settings; the origin of life on the earth and possibly elsewhere; the evolution of life and the development of intelligence and technology. Also discussed are the ramifications of the development of life and intelligence for the atmosphere and the biosphere.

**Learning Objectives**

1. Apply concepts and tools drawn from astronomy, physics, chemistry, and biology in order to understand the links between the science knowledge, extraterrestrial and our own life, and environment for life.
2. Synthesize quantitative, qualitative, and technical information to make informed judgments about the reciprocal relationship between the science knowledge, extraterrestrial and our own life, and environment for life.

**Required texts & Materials:**

1. Life in the Universe, 5<sup>th</sup> Edition by Bennett, Shostak, Schneider & MacGregor Copyright 2022. ISBN: 9780691241784 (3-4<sup>th</sup> edition is fine if you find it cheaper).
2. PointSolutions response pad (“clicker”). Check PointSolutions App + license (purchase) to use your mobile device as a substitute of clicker. See instruction: <https://support.echo360.com/hc/en-us/categories/17523673532429-PointSolutions>

**Course Grading:** The grading for the course will be based on

1. Quizzes in class meetings (10% total)
2. Three examinations (30% each)

***No additional point will be offered.*** The exams will cover material presented in class and contained within reading assignments. In accordance with University policies, it is the students' responsibility to schedule classes so as to avoid conflicts. *Check the schedule at the beginning of the semester!* All dates and times are in local time in New York.

### **Examinations & Quizzes:**

1. **All exams** will be held in the regular classroom in the regular class time. Exams consist of multiple-choice questions. No practice exam will be given, but quiz questions in class should serve for practice.
2. **Missed exams:** makeup exams will be given only on the basis of valid medical absence that can be verified by the instructor, because of jury duty or military service. *In any event that students miss exam, students must contact the instructor and receive an approval before the exam.* No makeup will be allowed more than one week after the original exam date in any circumstance.
3. **Quiz questions** will be administrated at random times during class meetings via clicker.
  - a. Practice quizzes (not for grade) will be given in the first two weeks of semester.
  - b. The lowest three-week quiz scores will be dropped to accommodate any circumstances. Beyond that, no makeup quiz will be given under any circumstances.
4. **Challenges to grades:** Challenges of any score and grade for exam or quiz must be made within 5 business days of the posting of the grade. No changes will be made to a grade after that time regardless of cause.

**Brightspace:** All students must regularly monitor Brightspace for notices and changes to course information including the syllabus. Quiz and exam scores will be posted on Brightspace.

### **Additional Course Policies:**

- **Student Responsibilities:** You will be expected to abide by all University regulations, procedures, requirements, and deadlines as described in the *Undergraduate Student Bulletin*.
- **Attendance:** As per the University policy outlined in the *Undergraduate Student Bulletin*, you are expected to regularly attend all classes and to participate in the classroom experience.
- **Classroom Behavior and Conduct:** You are expected to conduct yourself in accordance with the minimal undergraduate student responsibilities described in the *Undergraduate Student Bulletin* including:
  - o You are expected to arrive for class promptly.
  - o Avoid behavior that is disruptive to the classroom.
  - o Avoid conversations during class
  - o Be familiar with material presented in previous lectures.

## University Policies:

- **Student Accessibility Support Center Statement:** If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact the Student Accessibility Support Center, 128 ECC Building, (631) 632-6748, or at [sasc@stonybrook.edu](mailto:sasc@stonybrook.edu). They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and the Student Accessibility Support Center. For procedures and information go to the following website:

<https://ehs.stonybrook.edu//programs/fire-safety/emergency-evacuation/evacuation-guide-disabilities>

and search Fire Safety and Evacuation and Disabilities.

- **Academic Integrity Statement:** Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at [http://www.stonybrook.edu/commcms/academic\\_integrity/index.html](http://www.stonybrook.edu/commcms/academic_integrity/index.html)
- **Critical Incident Management:** Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of University Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.
- **Academic Dishonesty:** Any form of academic dishonesty, including cheating and plagiarism, will be reported to the Academic Judiciary. All parties involved (both the copier and the person who produced the original work) will be held accountable for any instance of plagiarism or dishonesty.
- **Electronic Communication:** Email to your University email account is an important way of communicating with you for this course. For most students the email address is 'firstname.lastname@stonybrook.edu'. *It is your responsibility to read your email received at this account.* For instructions about how to verify your University email address see this: <http://it.stonybrook.edu/help/kb/checking-or-changing-your-mail-forwarding-address-in-the-epo> If you choose to forward your University email to another account, we are not responsible for undeliverable messages.

- **Religious Observances:** See the policy statement regarding religious holidays at [http://www.stonybrook.edu/commcms/provost/faculty/handbook/employment/religious\\_holidays\\_policy.php](http://www.stonybrook.edu/commcms/provost/faculty/handbook/employment/religious_holidays_policy.php)

Students are expected to notify the course professors by email of their intention to take time out for religious observance. This should be done as soon as possible but definitely before the end of the 'add/drop' period. At that time they can discuss with the instructor(s) how they will be able to make up the work covered.

## AST248 Schedule for Fall 2023

#	Date	Chap	Subject
1	Aug 29	1	A Universe of Life?
2	31	1, 3	A Universe of Life? (Astronomical Context)
3	Sep 5	2	The Science of Life in the Univ. (Kepler, Galileo)
4	7	2	The Science of Life in the Univ. (Seasons, Life Probability)
5	12	2, 3	The Science of Life in the Univ. (Physical Quantities & Conservations)
6	14	2	The Science of Life in the Univ. (Law of Gravitation)
7	19	3	The Universal Context of Life (Chemistry)
8	21	3	The Universal Context of Life (Spectrum)
9	26		<b>Exam 1</b>
10	28	4	The Habitability of Earth (Age Dating)
11	Oct 3	4	The Habitability of Earth (Plate tectonics)
12	5	4	The Habitability of Earth (CO <sub>2</sub> Cycle & Stability)
13	10		<b>Fall Break</b>
14	12	5	The Nature of Life on Earth (Darwin)
15	17	5	The Nature of Life on Earth (DNA & RNA)
16	19	6	The Origin and Evolution of Life on Earth (Beginning of Life)
17	24	6	The Origin and Evolution of Life on Earth (Evolution of Life)
18	26	3.4, 3.5	The Universal Context of Life (Solar System Formation)
19	31		<b>Exam 2</b>
20	Nov 2	7	Searching for Life in Our Solar System
21	7	8	Mars
22	9	9	Life on Jovian Moons
23	14	9	Life on Jovian Moons
24	16	10	The Nature and Evolution of Habitability (Habitable Zone)
25	21	10	The Nature and Evolution of Habitability (Runaway Greenhouse & Climate Change)
26	23		<b>Thanksgiving Break</b>
27	28	11	Extrasolar Planets: Their Nature and Potential Habitability (Stellar Evolution)
28	30	11	Extrasolar Planets: Their Nature and Potential Habitability (Exoplanet Search)
29	Dec 5	12, 13	The Search for Extraterrestrial Intelligence (Drake Equation), Interstellar Travel and the Fermi Paradox
30	7		<b>Exam 3</b>