

# ASTR 100 Spring Semester 2016

## “Life and Intelligence in the Universe”

### 1. Overview

ASTR 100 is a seminar course intended for freshmen interested in astronomy and astrophysics. But other majors and non-freshmen are welcome. The topic chosen for this semester is “Astrobiology: Life and Intelligence in the Universe.” This is not a distribution course.

### 2. Instructor

Prof. Edison Liang  
Office: Rm 342 Herman Brown Hall (HBH)  
Office Hours: appointments via email  
Telephone: x3524; Email: [liang@rice.edu](mailto:liang@rice.edu)

### 3. Class Website: <http://spacibm.rice.edu/~liang/astr100>

Please check regularly for news and announcements posted on the class website.

### 4. Classroom and Time

Class is currently set for Wed 2-2:50 pm in Brockman 103. If an additional section is offered due to overflow, the additional time slot and place will be decided after the organization meeting on Wed 1/13/16. Students who cannot make the first class on Wed 1/13/16 or have a time conflict with Wed 2-2:50 pm should email instructor with their preferred class times.

### 5. Class Format

This is a seminar course (one hour per week). So students are expected to do most of the talking using powerpoints. After an introductory overview by the professor, students will take over the weekly classes by presenting summaries and commentary on each Chapter of the Text, plus related material from the web and other literature, followed by questions and answers, and feedback from the audience. A round-table discussion of questions in each Chapter will follow. All students should participate in the round-table. Class participation is an important part of the grade and learning experience for this course. Students who miss class must give written notice and explanation to instructor.

### 6. Text

“Life in the Universe” by J. Bennett & S. Shostak

© 3rd Edition 2012, Addison-Wesley

This is an excellent (though rather non-mathematical) comprehensive discussion of astrobiology, which will serve as a framework for topics covered in class. Students will take turns to summarize and discuss each Chapter plus related material from the web and other literature. Nonetheless, all students are expected to familiarize with and participate in discussions of all chapters, including those chapters he/she is not presenting.

Other references:

“Intelligent Life in the Universe” by I. S. Shklovskii & C. Sagan © 1998 Emerson-Adams

“An Introduction to Astrobiology” edited by D.A. Rothery, I. Gilmour and M.A. Sephton 2003 edition Cambridge University Press

“Complete Course in Astrobiology” edited by G. Horneck & P. Rettberg 2007 edition Wiley-Vch, Germany

## 7. Topic Sequence

The topical sequence follows the “Life in the Universe” textbook. Below is a tentative schedule based on 13 class weeks after the first week.

Week #	Topic	Text Chapter	Speaker
00	Organization & Overview	N/A	Professor
01	A Universe of Life	01	Student
02	Science of Life	02	Student
03	Universal Context of Life	03	Student
04	Habitability of Earth	04	Student
05	Nature of Life on Earth	05	Student
06	Origin and Evolution of Life on Earth	06	Student
07	Search for life in solar system	07	Student
08	Mars	08	Student
09	Life on Jovian Moons	09	Student
10	Nature and Evolution of Habitability & Habitability outside the solar system	10 11	Student
11	Search for Exoplanets	N/A	Student
12	Extraterrestrial Intelligence	12	Student
13	Interstellar Travel & Fermi Paradox	13	Student

## 8. Grade

Class participation and attendance 15%

Presentations: 50%

Final project report: 35%

## 9. Rice Honor Code

Students are expected to uphold the Rice Honor Code. Students are allowed to work together in preparations, but the final presentation and term paper must be his/her own work. Material downloaded from the web must be acknowledged and given proper references.

## 10. Course Objectives

This is a course on the science of life and intelligence in the universe. While there will be plenty of speculations on many topics, the methodology should be based on hard science and established facts. Students will be introduced to all fields of science relevant to life on earth and beyond, including astronomy, physics, chemistry, biology, geology, climatology, planetary science and space exploration. In addition, the powerpoint presentation will be used to train students in the skills of communication and public speaking, and the term paper will be used to train students in writing skills and literature search.

### **11. Learning Outcomes**

Students will take turns presenting and summarizing the material of one Text chapter each week. All students will discuss in a round-table format the problems and questions at the end of each Chapter, plus additional questions posed by the speaker and/or instructor. Through presentations, students will improve their public speaking skills. Through round-table discussions, students will develop skills in group-interaction. In addition to learning scientific facts, students will learn about the scientific method, and become knowledgeable of major unsolved problems. The final term paper will help students to improve their writing skills. Both the powerpoint presentation and the term paper will train students on how to use the internet to search for useful and trustworthy information.

### **12. Disability**

Any student with a documented disability that requires accommodation should contact both the course instructor and Disability Support Services in the Allen Center.