Course: 4803-D
Special Topics: Astrobiology

Course Objectives:
Have you ever wondered how life originated? How old is the Universe? Are there extraterrestrial life forms? Then this is the course for you. Astrobiology is the study of the origins, evolution, distribution and future of life in the Universe. In this course, we will examine the formation of the solar system, the geological history of Earth, the origins and distribution of life on Earth, the possibility of life outside Earth and other fascinating aspect of Astrobiology.

This course is intended to provide a survey of multiple scientific disciplines. We encourage student enrollment from diverse majors such as Biology, Chemistry, Earth and Atmospheric Sciences, Physics, and others.

Text:
Required: Bennett & Szostak 'Life in the Universe', 3rd Edition, Pearson Publishers
available at Barnes and Noble and the Engineering Bookstore
Recommended: Steven Benner 'Life, the Universe...and the Scientific Method', published by FfAME Press

Course Format:
This course is three credit hours, meeting twice per week. The course will be a mixture of lectures, student presentations and discussions.

Attendance and Conduct:
Each student is allowed to have one unexcused absence from class. Written verification will be required for all other excuses. Student conduct must follow the Student Honor Code (http://www.honor.gatech.edu).

Grades:
Students will often be required to do weekly readings and homework assignments from the required Astrobiology textbook. Each student will be required to write two research articles on topics agreed upon by the student and instructor. Each article should be 5-10 double-spaced and include sections such as introduction, results, important concepts, conclusions and future missions. A team project that describes a research activity for high school students will be due at the end of the semester and this will be completed in conjunction with Georgia Tech's CEISMC program.

Student Presentations (two)	60%
Homework	10%
Participation	10%
Final Project	20%

Grades will be assigned according to the following scale: A=90-100%, B=80-89%, C=70-79%, D=60-69% and F=below 60%.

Schedule:
Week 1 (Aug 23 & 25)
Scientific Method, Formation of the Universe

Week 2 (Aug 30 & Sept 1)
Topics of Interest to the Class, Formation of Moon, Dating the age of the Earth

Week 3 (Sept 6 & 8)
Drake Equation, Space Travel, Fermi & Einstein

Week 4 (Sept 13 & 15)
Early Life on Earth

Week 5 (Sept 20 & 22)
Replay Tape of Life (Guest Lecturer Dr. Betul Arslan)
Biosignatures (Guest Lecturer Josh Stern)

Week 6 (Sept 27 & 29)
Stromatolites & Extremophiles

Week 7 (Oct 4 & 6)
Planetary Protection

Week 8 (Oct 11 & 13)
History of Mars and Potential Life (Guest Lecture Prof. James Wray, EAS)

Week 9 (Oct 20)
Spectral Classification and Life in the Solar System

Week 10 (Oct 25 & 27)
Life Throughout Earth's History

Week 11 (Nov 1 & 3)
Prebiotic Chemistry

Week 12 (Nov 8 & 10)
Exoplanets

Week 13 (Nov 15 & 17)
Life in Alternative Environments & Sun/Earth interactions

Week 14 (Nov 22)
Saturn and its Moons

Week 15 (Nov 29 & Dec 1)
Europa & Formation of the Elements of Life

Week 16 (Dec 6 & 8)
Undergrad presentations on research activities

Instructor:
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Office hours by appointment