

Intro to Astrobiology

PHYS106
(2018 Fall)

Alt. Title **Are we alone? A possibility of life elsewhere in the universe!?!**

Credits **3 credits** towards the Science (S) GEP requirements for UMBC graduation

Prerequisite **None** but Mathematical ability at the level of high-school algebra, geometry and trigonometry

Corequisite **None**

Meetings **M,W,F 09:00-09:50 in UC115 Rm 115** (Aug29-Dec10)

(unless otherwise notified)

Texts/Resources **No Commercial Texts are required!**

A list of free online resources will be provided. A review of regular textbooks (for those that wish to purchase a regular text as a back-up resource) will also be provided.

Materials Scientific Calculator (non programmable). *No devices (like smart phones, tablets etc) with internet-connectivity will be allowed in exams*

Instructors etc **Prime Instructor: Dr. Ian M George**

Office	Physics Building, Room 410
Office Hours	M,W,F, 12:30-14:00
Phone	+1-410-455-1618 <i>(but e-mail is far better)</i>
e-mail	mailto:ian.george@umbc.edu

T.A./Grader(s): To be announced (if any)

Office	<i>To be announced</i>
Office Hours	<i>To be announced</i>
Phone	<i>To be announced</i>
e-mail	<i>To be announced</i>

Course Overview The prospect of extraterrestrial life is considered in the context of our current paradigm for the formation and history of stars, galaxies *etc* in the Universe that ultimately led to life on Earth. Given '*life*' happened here, could it have happened elsewhere? The course content mainly covers the fields of astronomy, planetology, and biology. However the multidisciplinary nature of this topic also requires some basic information in chemistry, geology, and physics. While a broad overview is stressed, some topics will be treated in depth. No formal experience in physics, biology or astronomy is required. However some familiarity with basic concepts in these fields will be helpful.

Course Objectives The main objectives of the course are for students to become familiar with the latest ideas in astrobiology. Specifically we will explore our current definitions of '*life*', the prospects of life having evolved elsewhere in the known universe, and the prospects of humans discovering strong evidence for current (or past life) beyond Earth in the next few decades. The course will focus on the basic physical conditions for 'primitive' life to come into existence rather than the possibility of '*little green men*' or the '*Borg*' *etc* having already visited Earth. Should time allow, we will however take a quick look at the issues associated with reports, debates, & myths regarding Roswell, "Area-51" *etc*.



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A ***provisional*** schedule of topics to be covered will be supplied during the 1st few classes. However please note that note this *may be revised* as the course progresses. **A detailed week-by-week schedule covered, homework due-dates etc will be updated continuously during the semester via UMBC Blackboard, in-class announcements, and/or e-mails**

PHYS 106 addressed the following General Learning Goals and Course Learning Goals

Course-specific By the end of the course, successful students will be able to:

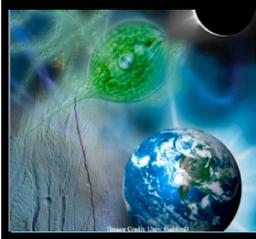
- learning objectives*
- A. Describe the wide variety of carbon-based life on Earth
 - B. Have an overview of the formation, planetary science, and biological processes that made Earth habitable.
 - C. Understand the search for evidence of past (or current) life elsewhere in our Solar System, particularly on Mars.
 - D. Understand current ideas as to whether life may be present elsewhere in the universe.
 - E. Discuss some of the claims & likelihood that intelligent life may have already visited Earth.

- Itemized Objectives*
- i) Understand and use mathematical and scientific methods of inquiry, reasoning, processes, and strategies to investigate and solve problems.
 - ii) Organize, interpret, draw inferences, and make predictions about natural or behavioral phenomena using mathematical and scientific models and theories.
 - iii) Recognize the ethical and social implications of scientific inquiry and technological change and distinguish science from non-science and pseudoscience.
 - iv) Recognize that mathematical, statistical, and scientific evidence requires evaluation.

Combining the general functional competencies with the topic-specific goals, students who successfully complete the course should be able to understand new articles in general astronomy and astrobiology relating to recent findings in astronomy as well as non-professional science periodicals.

*Grading
Summary*

Final Exam	30%
Mid-Term#1	10%
Mid-Term#2	20%
Homework	35%
Attendance of "Telescope Night"	5%



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Upcoming Important Dates *(last update 2018 Aug 01)*

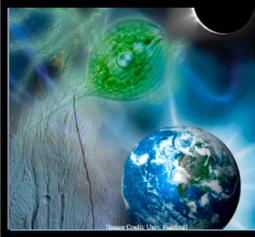
Those dates in italics are *PROVISIONAL* at the current time.

Date (2018)	Event
Aug 29 (Wed)	First PHYS106 Class 09:00-09:50, UC Rm 115
Sep 03 (Mon)	No Class: Labor Day
Sep 04 (Tue)	Last Day to Add Name to Wait List
Sep 12 (Wed)	Last Day to Add Course, to Drop w/o "W", etc etc
Sep 15 (Sat)	Last Day to Apply for 2018 Fall Graduation
Sep 25 (Tue)	Last Day to switch from Regular Grade to Pass/Fail
Oct 01 (Mon)	<i>Provisional Date of Exam01</i>
Oct 02/03 (Tue/Wed)	<i>Provisional Dates for 'Telescope Nights' ~20:00-21:30 Meeting in Physics Bldg Room 401 - more details to follow</i>
Nov 12 (Mon)	<i>Provisional Date of Exam02</i>
Nov 13 (Tue)	Last Day to Drop class (w/ "W")
Nov 23 (Fri)	No Class: Thanksgiving Break
Dec 10 (Mon)	Last PHYS106 Class
Dec 11 (Tue)	Last Day of Classes
Dec 12 (Wed)	Official UMBC Study Day
Dec 14 (Fri)	PHYS106 Final Exam 08:00-10:00, UC Rm 115
Dec 20 (Thu)	Undergraduate Commencement

Check the UMBC dates at:

<https://registrar.umbc.edu/calendars/academic-calendars/>

<https://registrar.umbc.edu/calendars/final-exams/>



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FERPA Statement

A federal law, the *Family Educational Rights And Privacy Act* of 1974 (also known as **FERPA**) as updated by the *Buckley Amendment*, affords students certain rights concerning their student educational records. Students have the right to have some control over the disclosure of information from the records. Educational institutions have the responsibility to prevent improper disclosure of personally identifiable information from the records.

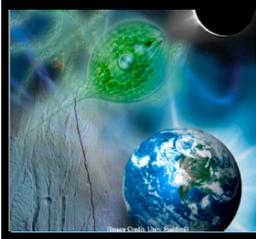
Students: As a result of FERPA we cannot [& will not] discuss your on-going academic performance during this class with unauthorized parties without your explicit written permission. ***This includes your parents or guardians.*** Should you wish to allow me (as the Instructor) to provide your educational records to another party, you will need to fill out a form available from

<https://academicpolicy.umbc.edu/home/academic-resources/>

and submit it as instructed by a cognizant university official. Please note

You are under no obligation to consent to this release of your educational records.

[The above does not apply to official UMBC transcripts *etc* authorized by you.]



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Title IX Statement

As an instructor, I am considered a Responsible Employee, per [UMBC's Policy on Prohibited Sexual Misconduct, Interpersonal Violence, and Other Related Misconduct](http://humanrelations.umbc.edu/sexual-misconduct/umbc-resource-page-for-sexual-misconduct-and-other-related-misconduct/) (located at <http://humanrelations.umbc.edu/sexual-misconduct/umbc-resource-page-for-sexual-misconduct-and-other-related-misconduct/>). While my goal is for you to be able to share information related to your life experiences through discussion and written work, I want to be transparent that as a Responsible Employee I am required to report disclosures of sexual assault, domestic violence, relationship violence, stalking, and/or gender-based harassment to the University's Title IX Coordinator.

As an instructor, I also have a mandatory obligation to report disclosures of or suspected instances of child abuse or neglect (www.usmh.usmd.edu/regents/bylaws/SectionVI/VI150.pdf). The purpose of these reporting requirements is for the University to inform you of options, supports and resources; **you will NOT be forced to file a report with the police**. Further, you are able to receive supports and resources, even if you choose to not want any action taken. Please note that in certain situations, based on the nature of the disclosure, the University may need to take action.

If you need to speak with someone in confidence about an incident, UMBC has the following Confidential Resources available to support you:

The Counseling Center: 410-455-2472

University Health Services: 410-455-2542

(After-hours counseling and care available by calling campus police at 410-455-5555)

Other on-campus supports and resources:

The Women's Center, 410-455-2714

Title IX Coordinator, 410-455-1606

Additional on and off campus supports and resources can be found at:

<http://humanrelations.umbc.edu/sexual-misconduct/gender-equitytitle-ix/>.