

Syllabus	<b>PHYS 106</b> <b>Introduction to Astrobiology</b>	UMBC 2016 Fall
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<i>Credits</i>	3 credits
<i>Alt. Title</i>	<i>Are we alone? The possibility of life elsewhere in the universe</i>
<i>Prerequisite</i>	None, but Mathematical ability at the level of high school algebra, geometry and trigonometry
<i>Corequisite</i>	None
<i>Lectures</i>	Mon, Weds, Fri 09:00-10:00 (main campus) Sherman, Rm 145
<i>Texts</i>	No Commercial Texts are required! A list of free online resources will be provided. <i>A review of regular textbooks (for those that wish to purchase a regular text as a backup resource) will also be provided.</i>
<i>Materials</i>	Scientific Calculator (non-programmable) <i>No devices (like smart-phones, tablets, etc) with internet-connectivity will be allowed in exams.</i>
<i>Instructor</i>	<b>Dr. Ian M George</b> Office Physics Room 410 <b>Office Hours M,W,F 10:30-11:30</b> Phone 1-410-455-1518 <b>e-mail <a href="mailto:ian.george@umbc.edu">mailto:ian.george@umbc.edu</a></b>
<i>T.A./Grader</i>	None

*Course Overview* The prospect of extraterrestrial life is considered in the context of the evolution of the Universe and of life on Earth. Course material is taken largely from astronomy, planetology, and biology although the multidisciplinary nature of this topic also requires basic information in chemistry, geology, and physics. While a broad overview is stressed, some topics will be treated in depth. While no formal experience in physics or astronomy is required, some familiarity with basic concepts in astronomy is 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. having already visited Earth

UMBC GEP <i>'Functional Competencies'</i>	<b>PHYS 106</b> <b>Introduction to Astrobiology</b>	UMBC 2016 Fall
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*Course-specific learning objectives* By the end of the course, successful students will be able to:

1. Describe the wide variety of carbon-based life on Earth
2. Have an overview of the formation, planetary science, and biological processes that made Earth habitable.
3. Understand the search for evidence of past (or current) life elsewhere in our Solar System, particularly on Mars.
4. Understand current ideas as to whether life may be present elsewhere in the universe.
5. 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.

*Evaluation* Student learning will be evaluated by their answers to questions set in exams, for homework, and/or in-class quizzes and projects.

<i>Grading Summary</i>	Final Exam	30%
	Mid-Term#1	10%
	Mid-Term#2	20%
	Homework	40%

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