

Credits: 2 **General Education Categories:** #2 (Critical Thinking) and #3 (Natural Science)

Time/Room: 2:00 to 3:45 p.m. Tuesdays in Trafton C314

Instructor: Dr. James Pierce; **office:** TN N151; **phone:** 389-1114; **email:** jpierce@mnsu.edu;
office hours: MWF 9,12 MW 2 T 10,1 **web:** <http://mavdisk.mnsu.edu/jpierce/>

Text: Pierce: *Life in the Universe: The Abundance of Extraterrestrial Civilizations* (2008)

Content: Is there life on other planets? Is the Earth being visited by beings from Outer Space? Are there real Star Wars going on somewhere? If these questions intrigue you, you are in the right course. In **Astronomy 115** we will be discussing various aspects of the question of the existence of extraterrestrial intelligent life. We do not know the answer to this question and probably will still not know it by the end of the term. Although our focus will be on the astronomical features of the problem, our investigations will involve other disciplines too, such as mathematics, physics, chemistry, and biology. Some previous familiarity with these subjects will be helpful, but it is certainly not required. While I do not demand that you adopt a particular viewpoint this term, I will require that you comprehend the scientific principles well enough to enable you to analyze positions expressed on either side of the issue. The main objective of this course is not simply the presentation of information to be memorized, but rather the analysis of a mixture of data, facts, theories, speculations, opinions, and half-truths. In order to earn a good grade in this course you must demonstrate your critical thinking skills as you develop, discuss, and defend the various facts and opinions relating to extraterrestrial life.

Assignments: There will be a variety of assignments, some easy and some more difficult. Assignments will usually be due one week after they are given out. (Points will be deducted for late assignments.)

Tests: There will be two exams – a midterm and a final. These tests will be primarily essay in nature, covering topics discussed in the text and during class.

Video Reviews: We will be watching a number of videos this semester. Following each of them, you will be given a few minutes to write a very short review containing the following:

- 1) One sentence (*only*) explaining the purpose of the video;
- 2) One sentence (*only*) describing the video's most memorable scene;
- 3) A few complete sentences expressing your overall reaction to the video.

Some critical thinking should also be apparent in your writing. Your video review, worth a maximum of four points, must be turned in before you leave class that day.

Book Review: To broaden your perspective on *Life in the Universe*, you will each be required to read *another* book that focuses on this topic (in addition to your text) and to write a short review on it. Your book choice (author, title, publication date) must be submitted in writing for approval (use the pdf handout on my website). Your review should include a discussion of the following questions, with an emphasis on how the book pertains to the topic of extraterrestrial life:

- 1) What was the theme of this book and how does it fit into our discussion of extraterrestrial life?
- 2) What major points did the author raise that you had not encountered before?
- 3) Was the author's writing convincing or were you skeptical of his/her claims (critical thinking again)?

The length of your book review should be one and one half to two pages, typed (or word-processed) and double-spaced, using a 10- or 12-point font.

AstroEssay: The AstroEssay will give you a chance to express your opinion on the principal topic of discussion this semester:

"Do Extraterrestrial Technical Civilizations Currently Exist in Our Galaxy?"

This essay should be a relatively concise, logical statement of your opinion, including scientific arguments, facts, and references to support your view. Length should be two to four pages, typed (or word-processed) and double-spaced, using a 10- or 12-point font. Typographical errors, misspellings, grammatical errors, and general illegibility or incoherence will reduce your score, of course. Essays written without regard for the scientific principles discussed in class and those that fail to display a sufficient degree of critical thinking will also receive lower scores.

Observing: You will have an opportunity to earn some observing points by visiting Standeford Observatory this semester. See the observing handout for details.

Grading: Toward the end of the term, the registrar will inquire of me whether I have found intelligent life in this classroom. I will employ the following point system to assist me in this important search:

100 points – Assignments (5 @ 20 points)
 30 points – Video Reviews (4 points each)
 20 points – Observing
 60 points – Midterm
 30 points – Book Review
 60 points – AstroEssay
100 points – Final
 380 points – Total

Final letter grades will be assigned on the basis of the total point distribution. Anticipated grade ranges are as follows:

A+ 95% A 90% A- 85% B+ 80% B 75% B- 70% C+ 65% C 60% C- 55% D+ 53% D 50% D- 48% F
 P 60% NC

I will keep you informed of your point total as the session progresses. If you would like a personal assessment of your standing in the class, feel free to stop by my office and ask me.

Remarks: If you have questions about assignments, exams, or course material that you would like to discuss outside of the classroom, please come to my office. Every attempt will be made to accommodate qualified students with disabilities. If you are a student with a documented disability, please see me as early in the semester as possible to discuss the necessary accommodations, and/or contact the Disability Services Office at 507-389-2825 (V) or 1-800-627-3529 (MRS/TTY). This document is available in alternative format by calling 507-389-1114 (V) or 1-800-627-3529 (MRS/TTY).

Approximate Schedule of Topics:

<u>Class #</u>	<u>Date</u>	<u>Lecture Topics</u>	<u>Pierce Chapters</u>
1	Jan 11	Our Place in the Universe	1
2	Jan 18	The Methods of Science	2, 3
3	Jan 25	The Chemistry of Life	3
4	Feb 1	Earth and Other Planets	4, 5
5	Feb 8	BOOK CHOICE DUE	
5	Feb 8	The Dissimilar Stars	6
6	Feb 15	Habitable Zones; the Drake Equation	6, 7
7	Feb 22	Review	
8	Mar 1	MIDTERM EXAM	
9	Mar 15	Interstellar Space Travel	8
10	Mar 22	Extraterrestrial Visitors	8
11	Mar 29	BOOK REVIEW DUE	
11	Mar 29	Interstellar Communications	9
12	Apr 5	Pictogram Messages	9
13	Apr 12	Technical Civilizations	10
14	Apr 19	ESSAY DUE	
14	Apr 19	Hypotheses & Conclusions	11
15	Apr 26	More H & C; Review	11
M	May 2	12:30 p.m. FINAL EXAM	