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- *By enrolling in this course you agree to accept its rules and policies.*
- You are responsible for carefully reading and understanding the whole syllabus.

TEXTBOOKS.

1. *Astronomy*, a Pearson Custom Library publication, that contains material from the books *Life in the Universe*, by Jeffrey Bennett and Seth Shostak, and *The Cosmic Perspective*, by Jeffrey Bennett et al. You should be aware that, at present, no single textbook covers the material at an introductory level and in a balanced way. Although we have chosen a good text which touches on many of the ideas covered in the course, coverage is uneven. Some areas exceed the depth appropriate for this course, and some areas are covered only superficially. We may post additional material on D2L to complement the textbook. Thus, *attendance at the lectures is essential to your success in this course.*

2. *Weird Life: the search for life that is very, very different from our own.* David Toomey (2013) W.W. Norton.

Note: You are expected to have taken at least two different science courses at the high school and/or university level. Please note that this is a 200-level science course. Take that into consideration when you "budget" your study time.

COURSE OUTLINE

- This course is a scientific interdisciplinary overview of the origin of the universe, the matter within it, the stars and planets, the more complex molecules of which living organisms are made, and processes that operated on Earth that permitted life to evolve from simple, single-celled organisms to the complex organisms existing in our era.
- In the first half of the course, we investigate the processes which led to the formation of all the matter (and energy) in the universe, how the stars formed, and how the atoms of which you are comprised were forged. These events commenced 13.80 ± 0.04 billion years ago! The story of how we can look back in time to explore the events which led to the formation of the Earth is one of the most fascinating in science. We focus on the formation of our own solar system, our own planet, and how the conditions in the early history of the Earth set the stage for the development of life.
- In the second half of the course, we discuss the current understanding of the mechanisms for the formation of simple organic molecules and how those molecules could have organized to lead to the first self-replicating cells containing genetic material. We follow the fossil evidence of life through time on Earth and how processes taking place on the planet affected life, for example, the role of plate tectonics, the buffering of oxygen when primitive bacteria produced this gas as a waste product, the conditions which fostered rapid speciation, and circumstances that nearly eradicated life several times in the past. We discuss the broad sweep of evolution and the importance of genetics to evolution, what genes are and how new genes arise. We also explore the origins of a particular organism, *Homo sapiens sapiens*. We will also scientifically examine the possibility of extraterrestrial life / intelligence.

GRADING. We follow the University standards for grades. Your final grade (%) will be calculated by adding your total points / 180 as outlined below.

- There will be 5 exams, 45 points each, including a comprehensive final exam. We'll only count the four higher scores (see below; all exams will most likely multiple-choice, but we reserve the right to include short answer questions at our discretion).
- There will be no exam make-ups. Please do not ask.
- If you take all five exams, we'll drop the lowest score. If you miss one exam, that will be the lowest grade (0) by default and will be eliminated. If you miss two or more exams, you will get zero points for each exam you miss. Each case where this happens will be dealt with on an individual basis based on the reasons for the missed exams. Valid reasons (with legitimate documentation) include illness, death in the immediate family, military service/deployment etc.).
- Please note that there is no such thing as individual extra credit in this course. We will not e-mail grades.
- There will be no exam make-ups (*Yes, we are saying this again*)
- We will round grades; for example, if you obtain a 92.5%, it will be counted as 93%; 92.4% will be counted as 92%, etc. No exceptions.
- *If you use a cell phone or text during an exam for whatever reason, you will get an automatic zero ("0") in the exam. The same thing will happen if we catch you cheating in any way. No exceptions, no second chances, no appeals.*

SCHEDULE OF TOPICS

Note: The listed readings are expected to be completed prior to the scheduled class session. The readings are intended to provide a foundation for topics covered in lecture, but the lectures will contain substantially more content than the readings. Thus, as stated above, *attendance at the lectures is essential to your success in this course.*

Date	**Topic**	**Readings**
25 Aug	Prelude; Our place in the universe	Astr Ch. 3: pp 49-68
27 Aug	Light: processes and perspectives (1)	Astr Ch. 3: pp 81-87
1 Sep	Light: processes and perspectives (2)	--
3 Sep	Distances to stars and other objects (1)	Astr Ch. 2: pp 23, 24; Ch. 3: pp 53-56
8 Sep	Distances to stars and other objects (2)	--
10 Sep	Origin of the universe	Astr Ch. 3: pp 59, 63-67
15 Sep	Conditions in the early universe	Astr Ch. 5: pp126-136
17 Sep	**Exam 1**	As above
22 Sep	Stellar evolution (1)	Astr Ch. 3: pp 61, 62, 78-81
24 Sep	Stellar evolution (2); Formation of the solar system (1)	Astr Ch. 4: pp98-115
29 sep	Formation of the solar system (2)	--
1 Oct	Earth: composition and structure of a habitable planet (1)	Astr Ch. 6: pp 144-165
6 Oct	**Fall Break – no class**	**Fall Break – no class**
8 Oct	Earth: composition and structure of a habitable planet (2)	Astr Ch. 6: pp 165-187
13 Oct	Important astrophysical processes that affect life on Earth	Astr Ch. 8: pp 256-263
15 Oct	**Exam 2**	As above
20 Oct	What is life? A historical perspective. Life is Chemistry!	Astr Ch. 7: pp 191-229; Toomey Ch. 3
22 Oct	What is life? A historical perspective. Life is Chemistry!	As above

	(cont.)	
27 Oct	The origin of life / artificial life	Astr Ch. 8: pp 233-247; Toomey Ch. 1
29 Oct	The origin of life / artificial life (cont.)	As above
3 Nov	Evolution in fact and theory	Astr Ch. 8: pp 248-256; 263-274
5 Nov	Evolution in fact and theory (cont.)	As above
10 Nov	**Exam 3**	As above
12 Nov	Life as we know it (or not) / Life in our solar system & elsewhere	Astr Ch. 9: pp 275-306; Ch. 10: pp 306-341; Toomey Ch. 2,4,5,6
17 Nov	Life as we know it (or not) / Life in our solar system & elsewhere (cont.).	As above
19 Nov	Life as we know it (or not) / Life in our solar system & elsewhere (cont.).	As above
24 Nov	The Drake Equation & SETI; Where are THEY?- Ceti / Extraterrestrial life – Possibilities & Consequences	Astr Ch. 11: pp 343-380; Ch. 12: pp 381-418; Toomey Ch. 7,8,9
26 Nov	**Thanksgiving break – no classes**	**Thanksgiving break – no classes**
1 Dec	The Drake Equation & SETI; Where are THEY?- Ceti / Extraterrestrial life – Possibilities & Consequences	As above
3 Dec	**Exam 4**	As above
10 Dec	**TBA**	

ACADEMIC INTEGRITY

It is the responsibility of each student to adhere to the university's standards for academic integrity. Violations of academic integrity include any act that violates the rights of another student in academic work, that involves misrepresentation of your own work, or that disrupts the instruction of the course. Other violations include (but are not limited to): cheating on assignments or examinations; plagiarizing, which means copying any part of another's work and/or using ideas of another and presenting them as one's own without giving proper credit to the source; selling, purchasing, or exchanging of term papers; falsifying of information; and using your own work from one class to fulfill the assignment for another class without significant modification. Proof of academic misconduct can result in the automatic failure and removal from this course. For questions regarding Academic Integrity, the No-Grade Policy, Sexual Harassment, or the Student Code of Conduct, students are encouraged to refer to the Undergraduate Handbook, the Undergraduate Catalogue, the Ram's Eye View, and the University website at www.wcupa.edu.

AMERICANS WITH DISABILITIES ACT

If you have a disability that requires accommodations under the Americans with Disabilities Act (ADA), please present your letter of accommodations and meet with me as soon as possible so that I can support your success in an informed manner. Accommodations cannot be granted retroactively. If you would like to know more about West Chester University's Services for Students with Disabilities(OSSD), please contact the OSSD which is located at 223 Lawrence Center. The OSSD hours of Operation are Monday – Friday 8:30 a.m. – 4:30 p.m. Their phone number is 610-436-2564, their fax number is 610-436-2600, their email address is ossd@wcupa.edu, and their website is at www.wcupa.edu/ussss/ossd.

EXCUSED ABSENCES POLICY FOR UNIVERSITY-SANCTIONED EVENTS

Students are advised to carefully read and comply with the excused absences policy for university-sanctioned events contained in the WCU Undergraduate Catalog. In particular, please note that the "responsibility for meeting academic requirements rests with the student," that this policy does not excuse students from completing required academic work, and that professors can require a "fair alternative" to attendance on those days that students must be absent from class in order to participate in a University-Sanctioned Event.

EMERGENCY PREPAREDNESS

All students are encouraged to sign up for the University's free WCU ALERT service, which delivers official WCU emergency text messages directly to your cell phone. For more information and to sign up, visit www.wcupa.edu/wcualert. To report an emergency, call the Department of Public Safety at 610-436-3311.

E-MAIL POLICIES STATEMENT

It is expected that faculty, staff, and students activate and maintain regular access to University provided e-mail accounts. Official university communications, including those from your instructor, will be sent through your university e-mail account. You are responsible for accessing that mail to be sure to obtain official University communications. Failure to access will not exempt individuals from the responsibilities associated with this course.

TITLE IX STATEMENT

West Chester University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with Title IX of the Education Amendments of 1972 and guidance from the Office for Civil Rights, the University requires faculty members to report incidents of sexual violence shared by students to the University's Title IX Coordinator, Ms. Lynn Klingensmith. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred to the person designated in the University protection of minors policy. Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at the webpage for the Office of Social Equity at http://www.wcupa.edu/_admin/social.equity/.

INTELLECTUAL PROPERTY STATEMENT

The instructors for this course utilize copyrighted materials under the "Freedom and Innovation Revitalizing United States Entrepreneurship Act of 2007" (Fair Use Act). Apart from such copyrighted materials, all other intellectual property associated with this course is owned and copyright protected by the instructors, including, but not limited to, lectures, course discussions, course notes and supplementary materials posted or provided to students authored by the instructor, assessment instruments such as quizzes and exams, and Power Point presentations. No recording, copying, storage in a retrieval system, or dissemination in any form, whether electronic or other format, by any means of the intellectual property of the instructor, either in whole or in part, is permitted without the prior written permission of the instructor. When such permission is granted, it must specify the utilization of the intellectual property and all such permissions and waivers shall terminate on the last day of finals in the semester in which this course is held.

Links and references to on-line resources provided by the instructors may lead to other sites. The instructors do not sponsor, endorse or otherwise approve of any information appearing in those sites, nor is responsible for the availability of, or the content located on or through, external sites. Apart from materials used in accordance with the Fair Use Act, the instructors takes no responsibility for material that is otherwise offered at web sites and makes no warranty that such material does not infringe any third party rights. However, should any of this type of material be present and this fact is brought to the attention of the instructors, they will remove references to it from course materials.