



## ASTR 120 – Life In The Universe COURSE SYLLABUS: Fall 2015

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### WHO I AM

**Instructor:** Dr. Kurtis A. Williams, Assistant Professor

**Office Location:** Science 145

**Office Phone:** 903-886-5516

**Office Fax:** 903-886-5480

**Office Hours:** T 1:30-2:30, W 3:00-3:50, Th 11:00-noon, or by appointment

**University Email Address:** [Kurtis.Williams@tamuc.edu](mailto:Kurtis.Williams@tamuc.edu)<sup>†</sup>

Please include “Astrobiology” in the subject line.

**Course Locations and Times:**

MWF 9:00 a.m. – 9:50 a.m. in Science 122

### WHAT THIS COURSE IS ABOUT

#### Course Description:

##### *University Catalog Description:*

The basic science of the search for evidence of life in the universe, including the origin and evolution of life on the Earth, terrestrial extremophiles, the history of the search for life in the Universe, the search for habitable environments in the Solar System, and the search for habitable (exo-)planets and signs of life around other stars.

##### *Additional Course Description*

Are we alone in the Universe? In the 1500s, the Catholic Church executed a monk who dared to suggest the presence of other intelligent species living on other worlds, yet over the past century, popular culture has become littered with discussions of space faring civilizations being commonplace. But is life common? Is intelligent life common? What is intelligence, anyway? What is life?

Since the discovery of the first planets outside our Solar System in the mid 1990s, the science of astrobiology has grown by leaps and bounds. It is a very broad field that attempts to bridge biology, chemistry, geology, physics and astronomy under one monumental goal: the discovery of life elsewhere in the Universe.

In this course, we will explore the field of astrobiology. We will look at the necessary ingredients for life. We will learn about possible habitats for life in our own Solar System. We

will explore how astronomers discover and study planetary systems around other stars. And we will end by discussing the probability of other civilizations in the Universe and how we might find them.

**Student Learning Outcomes:**

1. You will discuss the chemistry and origins of life on Earth.
2. You will employ knowledge of current and past life on Earth to identify criteria for habitability and life
3. You will identify potential habitats in our Solar System
4. You will calculate individual terms of the Drake Equation to estimate the number of intelligent civilizations in our galaxy
5. You will criticize proposed solutions to the Fermi Paradox

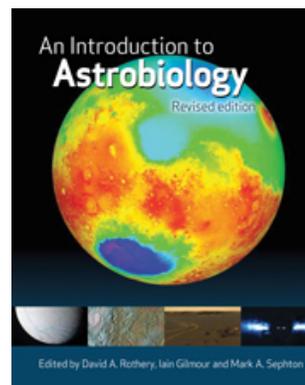
**WHAT YOU ABSOLUTELY NEED**

**Materials – Textbooks and Additional Reading:**

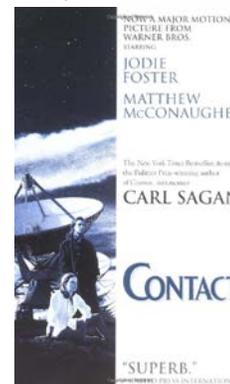
*Required on or before Monday, Sept 14:*

- **AN INTRODUCTION TO ASTROBIOLOGY, REVISED EDITION**, Edited by David A. Rothery, Iain Gilmour & Mark Sephton. ISBN 978-1-107-60093-5
- **CONTACT**, By Carl Sagan, ISBN 978-0-671-00410-1
- Access to a desktop or laptop computer capable of watching videos, reading articles on the internet, and logging in to LearningStudio (eCollege).

**Course Prerequisites:** None



**AND**



# HOW THE COURSE WILL WORK

## Instructional Methods / Activities / Assessments

### **Participation**

Research into how people learn shows that the best learning comes from interaction. Simply reading material and listening to me drone on won't help you learn anything useful. I therefore will require you to participate actively in the course.

Therefore, the lectures in this course may be significantly different than those in many courses you have taken. I feel that there is only so much a student can learn from a lecture, no matter how entertaining I may be. At some point, you need to take the knowledge, work with it, and make it your own. Therefore, each lecture will consist of short lectures focusing on important concepts with which students tend to struggle interspersed with various interactive activities. Your participation in these will be key to your success in understanding the material.

For these reasons, *attendance and class participation are mandatory and will count toward your final grade.* I realize that most of you are not comfortable speaking up in front of a large group of people, so class participation will come in a variety of forms, including interactive polling, small group discussions, and short in-class writing assignments. These in-class activities are graded primarily on whether you make an effort to participate. There is no penalty if you get an answer wrong, but correct answers may receive a small amount of extra credit.

**Participation grading policy:** You automatically get three excused absences, *no documentation required.* After these excused absences, all absences count against your participation grade. Note that a few non-excused absences don't affect your grade much at all, but excessive absences can. may miss three lectures without penalty. For example, there will be approximately 40 lectures during the semester. If you earn participation credit in 37 of them, you will receive 100% for your participation grade. If you earn participation credit in 34 lectures, your participation grade will be 34 out of 37, or 92%.

### **Reading Quizzes and Homework**

Reading quizzes will be given often at the start of a class to see if you have done the required reading. These are short and cover basic material, like definitions, facts in section headings, and end-of-chapter summaries. If you are tardy, you don't get to take it late.

Homework will be assigned for each unit. Homework will be distributed in class; due dates will be announced when it is distributed. Late homeworks are penalized 10% per day, up to a maximum of 70%. After 7 days, any missing homework will receive a zero.

The following are considered cheating and will not be tolerated: Searching for answers on the internet, obtaining copies of solutions to homework questions (whether from past students or other sources), directly copying another student's work, etc. See the section on "Academic Integrity" below for full details.

## **Essays**

A handful of short research essays will be assigned during the course of the semester. These will be graded on content, source material, and grammar. Essays should be written in Microsoft Word and will be submitted through LearningStudio (eCollege). Essays will also be checked for plagiarism through Turnitin.

## **Exams**

Short exams will be administered after each major unit. Details on the format and content will be given in class.

*Makeup exams may only be taken under extenuating circumstances.* I will require documentation of the reason for the absence, and I reserve the right to reject any excuse. In most cases, makeup exams will be scheduled within 2 days of the exam. Please do everything in your power to be present for an exam. There is no makeup exam possible for the final exam.

*If you are certified as needing special accommodations for examinations, please see me privately well before the exam with your letter of accommodation from the Student Disability Resources and Services office.*

## **Extra Credit: Observatory Visit or Planetarium Show**

You will have three opportunities for an optional visit to the Commerce Observatory (about 5 miles south of Commerce): a total eclipse of the moon on Monday, September 28 or telescope viewing on the evening of Tuesday, Oct 13 or Thursday Oct 15. Times will be announced. At each session, there will be an activity you must complete in order to earn extra credit.

You can also earn extra credit by attending a planetarium show. The A&M-Commerce Planetarium also exhibits several different shows every Friday night at 7pm and 8pm. Tickets are \$4 for children and students with student ID, \$4.50 for senior citizens, and \$5 for adults. Go to <http://www.tamuc.edu/communityOutreach/planetarium/default.aspx><sup>†</sup> for a current listing of shows. If you attend a show, tell the staff that you are a member of this class. They will make a note that you attended. Then email me two paragraphs: one summarizing the show, and a second telling me something specific about the show that you found interesting and why. If and only if you complete both of these steps, you will get extra credit toward your grade.

*Extra Credit Terms, Conditions, and Caveats:* You may only earn extra credit once, though you are welcome to attend as many of the observatory and planetarium events as you like. All extra credit work must be turned in on or before the last day of class. Family of any age is welcome to the planetarium shows; be sure to check on the age-appropriateness of shows (all are fine for all audiences, but some are aimed at children and some at adults).

## **Grading**

Grading will be done on an absolute scale with no competition. If you all earn an A, you all get an A. I may “curve” grades for specific assignments at my discretion, but your percentage earned will never go down if I apply such a curve. Your current grades will be available starting September 1 so you can track your progress. The gradebook on SmartWork is *not* official.

*Extra credit* opportunities are limited to observing nights at the observatory or attending a planetarium show. Outside of these opportunities, there is no extra credit available of any kind.

Grading is weighted by assignment using the following weights:

<b>Assignment Type:</b>	<b>Weight:</b>
Classroom Participation	15%
Reading Quizzes	5%
Homework Assignments	20%
Research Essays	20%
Midterm Exams	20%
Final Exam	20%

The grading scale is:

<b>Percentage Range</b>	<b>Grade</b>
90% to 100%	A
80% to 89.9%	B
70% to 79.9%	C
60% to 69.9%	D
Below 60%	F

## **TECHNOLOGY YOU WILL NEED**

This course is a technology enhanced course, meaning that some assignments (especially homework) must be completed online. You need to be comfortable with basic computing skills and web browsing, and to be able to access and learn to use the various tools on eCollege even if you are not familiar with them yet.

- To fully participate in this enhanced course you will need to use a current Flash enabled browser. For PC users, the suggested browser is Google Chrome or Mozilla Firefox. For Mac users, the most current update of Firefox is suggested.
- You will need regular access to a computer with a broadband Internet connection. The minimum computer requirements are:
  - 512 MB of RAM, 1 GB or more preferred
  - Broadband connection required courses are heavily video intensive
  - Video display capable of high-color 16-bit display 1024 x 768 or higher resolution
- You must have a:
  - Sound card, which is usually integrated into your desktop or laptop computer
  - Speakers or headphones.
- Both versions of Java (32 bit and 64 bit) must be installed and up to date on your machine. At a minimum Java 7, update 51, is required to support the learning

management system. The most current version of Java can be downloaded at: [JAVA web site](http://www.java.com/en/download/manual.jsp) <http://www.java.com/en/download/manual.jsp>

- Current anti-virus software must be installed and kept up to date.
- Run a browser check through the Pearson LearningStudio Technical Requirements website. [Browser Check](http://help.ecollege.com/LS_Tech_Req_WebHelp/en-us/#LS_Technical_Requirements.htm#Browset) [http://help.ecollege.com/LS\\_Tech\\_Req\\_WebHelp/en-us/#LS\\_Technical\\_Requirements.htm#Browset](http://help.ecollege.com/LS_Tech_Req_WebHelp/en-us/#LS_Technical_Requirements.htm#Browset)
- Running the browser check will ensure your internet browser is supported.
- Pop-ups must be allowed.
- JavaScript must be enabled.
- Cookies must be enabled.
- You will need some additional free software (plug-ins) for enhanced web browsing. Ensure that you download the free versions of the following software:
  - [Adobe Reader](https://get.adobe.com/reader/) <https://get.adobe.com/reader/>
  - [Adobe Flash Player](https://get.adobe.com/flashplayer/) (version 17 or later) <https://get.adobe.com/flashplayer/>
  - [Adobe Shockwave Player](https://get.adobe.com/shockwave/) <https://get.adobe.com/shockwave/>
  - [Apple Quick Time](http://www.apple.com/quicktime/download/) <http://www.apple.com/quicktime/download/>
- At a minimum, you must have Microsoft Office 2013, 2010, 2007 or Open Office. Microsoft Office is the standard office productivity software utilized by faculty, students, and staff. Microsoft Word is the standard word processing software, Microsoft Excel is the standard spreadsheet software, and Microsoft PowerPoint is the standard presentation software. Copying and pasting, along with attaching/uploading documents for assignment submission, will also be required. If you do not have Microsoft Office, you can check with the bookstore to see if they have any student copies.
- For additional information about system requirements, please see: [System Requirements for LearningStudio](https://secure.ecollege.com/tamuc/index.learn?action=technical) <https://secure.ecollege.com/tamuc/index.learn?action=technical>

## HOW TO GET STARTED, ACCESS, AND NAVIGATION

### **Pearson LearningStudio (eCollege) Access and Log in Information**

This course will be facilitated using Pearson LearningStudio, the learning management system used by Texas A&M University-Commerce. To get started with the course, go to [myLeo](http://www.tamuc.edu/myleo.aspx). <http://www.tamuc.edu/myleo.aspx>

**You will need your CWID and password to log in to the course. If you do not know your CWID or have forgotten your password, contact Technology Services at 903.468.6000 or [helpdesk@tamuc.edu](mailto:helpdesk@tamuc.edu).**

It is strongly recommended that you perform a “Browser Test” prior to the start of your course. To launch a browser test, login to Pearson LearningStudio, click on the “My Courses” tab, and then select the “Browser Test” link under Support Services.

	<b>App Title:</b>	<b>iPhone – Pearson LearningStudio Courses for iPhone</b> <b>Android – LearningStudio Courses - Phone</b>
	<b>Operating System:</b>	<b>iPhone</b> - OS 6 and above <b>Android</b> – Jelly Bean, Kitkat, and Lollipop OS
	<b>iPhone App URL:</b>	<a href="https://itunes.apple.com/us/app/pearson-learningstudio-courses/id977280011?mt=8">https://itunes.apple.com/us/app/pearson-learningstudio-courses/id977280011?mt=8</a>
	<b>Android App URL:</b>	<a href="https://play.google.com/store/apps/details?id=com.pearson.lsphone">https://play.google.com/store/apps/details?id=com.pearson.lsphone</a>

### Internet Access

An Internet connection is necessary to participate in assignments, access readings, and receive feedback from your professor. View the requirements as outlined in Technology Requirements above for more information.

### Class Handouts

Class materials such as copies of PowerPoint slides and electronic versions of handouts will be made available through LearningStudio.

### Courses Mobile App

The Courses apps for phones have been adapted to support the tasks students can easily complete on a smaller device. Due to the smaller screen size course content is not presented.

The Courses app is free of charge. The mobile Courses Apps are designed and adapted for different devices.

Once downloaded, search for Texas A&M University-Commerce, and it should appear on the list. Then you will need to sign into the myLeo Mobile portal.

The Courses App for Android and iPhone contain the following feature set:

- View titles/code/Instructor of all Courses enrolled in online
- View and respond to all discussions in individual Courses
- View Instructor Announcements in individual Courses
- View Graded items, Grades and comments in individual Courses
- Grade to Date
- View Events (assignments) and Calendar in individual Courses
- View Activity Feed for all courses
- View course filters on activities
- View link to Privacy Policy
- Ability to Sign out
- Send Feedback

## HELP!!!!

### Are you lost, confused, or worried?

First, **DON'T PANIC!**

Next, step back and try and pinpoint the source of your confusion:

- Have you read the textbook sections? If not, go read them! If you have, maybe you need to try a different reading methods. Science textbooks are not like novels; they present information in a completely different method than most reading material, and there is no plot thread unfolding as you get further into a chapter. Here are some websites with suggestions on how to read science textbooks:
  - How to Read Effectively in the Sciences: <http://academic.cuesta.edu/acasupp/AS/621.htm>
  - Reading Assignments in Science: <http://www.studygs.net/science/readingtexts.htm>
  - The SQ4R Method for Reading: <http://scs.tamu.edu/?q=node/105>
- Do you just need some time away? Astronomy is too much to deal with all at once. Work on the assignment over the week and give your brain some time to absorb and mull over the information.
- If after all of this you are still confused or uncertain, it's time to seek help. Don't wait until the exam! Here you have many options:
  - Talk to your classmates
  - Attend my office hours (see next section). You can come to real or virtual hours, or make an appointment with me if none of those times work.
  - Go to the JAMP room (Science 110). JAMP offers peer counselling and tutoring in many of the sciences; look for times when a physics tutor is available.
  - If you are still stuck, contact the Academic Success Center to search for other options that may help you. <http://www.tamuc.edu/studentLife/campusServices/academicSuccessCenter/>
  - Go to the following link [One Stop Shop](#)- created to serve you by attempting to provide as many resources as possible in one location. <http://www.tamuc.edu/admissions/onestopshop/>

### Are you experiencing technical difficulties?

*If your problems are with LearningStudio:*

Texas A&M University-Commerce provides students technical support in the use of Pearson LearningStudio. Technical assistance is available 24 hours a day/ 7 days a week.

If at any time you experience technical problems (e.g., you can't log in to the course, you can't see certain material, etc.) please contact the Pearson LearningStudio Help Desk, available 24 hours a day, seven days a week.

The student help desk may be reached by the following means 24 hours a day, seven days a week.

- **Chat Support:** Click on '*Live Support*' on the tool bar within your course to chat with a Pearson Learning Studio Representative.

- **Email:** [helpdesk@online.tamuc.org](mailto:helpdesk@online.tamuc.org) to initiate a support request with Pearson LearningStudio Technical Support Representative.

*Accessing Help from within Your Course:*

Click on the 'Tech Support' icon on the upper left side of the screen inside the course. You then will be able to get assistance via online chat, email or by phone by calling the Help Desk number noted below.

*Note:* Personal computer problems do not excuse the requirement to complete assigned work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, an Internet cafe, or a bookstore, such as Barnes & Noble, etc.

*Policy for Reporting Problems with Pearson LearningStudio:*

Should students encounter Pearson LearningStudio based problems while submitting assignments, the following procedure **MUST** be followed:

1. Students must report the problem to the help desk. You may reach the helpdesk at [helpdesk@online.tamuc.org](mailto:helpdesk@online.tamuc.org)
2. Students **MUST** file their problem with the helpdesk and obtain a helpdesk ticket number
3. Once a helpdesk ticket number is in your possession, students should email me to advise me of the problem and to provide me with the helpdesk ticket number
4. At that time, I will call the helpdesk to confirm your problem and follow up with you

**PLEASE NOTE:** Your personal computer/access problems are not a legitimate excuse for filing a ticket with the Pearson LearningStudio Help Desk. You are strongly encouraged to check for compatibility of your browser **BEFORE** the course begins and to take the Pearson LearningStudio tutorial offered for students who may require some extra assistance in navigating the Pearson LearningStudio platform. **ONLY** Pearson LearningStudio based problems are legitimate.

**Please don't contact me** for LearningStudio problems. I'll just tell you to take the above steps.

*If your problems are with myLeo:*

Your myLeo email address is required to send and receive all student correspondence. Please email [helpdesk@tamuc.edu](mailto:helpdesk@tamuc.edu) or call us at 903-468-6000 with any questions about setting up your myLeo email account. You may also access information at [myLeo](https://leo.tamuc.edu). <https://leo.tamuc.edu>

## **HOW TO CONTACT ME AND STAY CONNECTED**

### **Interaction with Instructor**

*Email:*

I can be reached by email at [Kurtis.Williams@tamuc.edu](mailto:Kurtis.Williams@tamuc.edu). Please put "Solar System" in your email subject header. It may take me up to 24 hours to send you a response (48 hours on the weekend or holidays). If you don't hear back from me in that time, please send another email or

give me a call. I assume you check your campus email daily, so if I send out a class email, I'll assume you read it.

#### *Texts and Email Announcements:*

I have set up an SMS (text and/or email) account for brief messages, like reminders of due dates, updates on class events, and other crucial messages. I expect you to make use of this service.

To register for text (SMS) updates, text “@astr120” (without quotes) to 81010 or (754) 333-5306. The service is free, but any standard messaging fees charged by your mobile provider will apply. To get automated email copies of any texts (like if you don't have texting or don't want to pay for it), send a blank email to: [astr1304@mail.remind.com](mailto:astr1304@mail.remind.com). The service is also private: nobody (including myself) will see your phone number or email, and only I can send messages.

Note this service is different than the new LearningStudio messaging service.

#### *Office Hours:*

Office hours are times that I set aside when I promise to be in my office so that you can come by and talk to me. During office hours, you can ask questions about the course material, ask about homework, see your current grade, or ask other questions about the class or astronomy in general. Office hours work best if you have your textbooks, class notes, and lecture tutorials with you.

It's important to realize that office hours are *not* just for students who are having problems in the course. If you are uncertain about anything, please visit, email, phone or drop into virtual hours before your small problems grow into big ones. If you are worried about what might be on the test, stop in. If you are curious about astronomy jobs and research, come by.

If you want to talk but cannot come during office hours, please contact me by email in order to set up an individual appointment. By setting an appointment, you both guarantee that I will be in my office (or online) and that I will have plenty of time to talk with you. You may feel free to stop by my office any time my door is open, but if you do not have an appointment and if it is not my scheduled office hours, please understand if I'm not free to talk.

#### *Facebook:*

Please don't friend me on Facebook during the semester; my feed is mainly cat videos and reminiscing on the 1980s and 1990s anyway.

#### **Netiquette**

I expect all students to behave to basic standards of etiquette both in real life on the web.

Abusive or inappropriate comments will be removed and earn a reprimand (or more, depending on the infraction); any additional lapses could result in disciplinary action. For a simple guide to netiquette, see <http://www.albion.com/netiquette/corerules.html>

## RULES, RULES, RULES (UNIVERSITY POLICIES)

### Academic integrity

A major goal of this and most every university course is for you to learn and appreciate subject material. Academic dishonesty (“cheating”) actively prevents you from achieving this goal. Academic dishonesty is taken seriously by the University and by me, and ***will not be tolerated.*** (See the TAMU-C Code of Student Conduct and the TAMU-C Procedures A 13.04, 13.12, 13.31, and 13.32.)

This conduct is not only considered wrong in this course and at this University, but also in the real world. Engaging in these activities will get you fired from a job and prevent you from getting another job.

Unethical student conduct includes:

- **Plagiarism**, or copying the words of others with the intent of making it look like your own. Whether you use someone else’s phrase word for word, or whether you try and change a few words, or even if you just borrow someone else’s original idea and don’t give them credit, that’s unethical. Use your own words whenever possible, give credit to wherever you got an idea, and put direct quotes inside quotation marks.
- **Cheating** involves trying to trick me or others into thinking you did work that you really didn’t do, or into thinking you know what you really don’t know. This can include stealing exams, changing your answers on a graded exam or assignment and claiming it was graded wrongly, putting your name on someone else’s homework, and so on.
  - ***Searching the Internet and simply cutting/pasting the text you find is considered cheating.*** Searching the Internet for help on a topic is okay. For example, suppose a question asks “Describe the life cycle of a star that has the same mass as the sun.” Typing that phrase into Google and cutting and pasting the text in the answer box is considered cheating. Typing “star life cycles” into Google, reading a few web pages, and summarizing the information in your own words is not cheating.
  - ***Borrowing a previous student’s homework, exams, or solution sets is considered cheating.*** “Borrowing” includes looking at someone’s submitted homework, screen shots, stealing returned homeworks, and so on.
- **Collusion** is working with another person to cheat. This can include copying someone else’s answers to an exam or assignment, doing work for another student, buying or otherwise obtaining homework/exam solutions from any source online or off-line, or any other instance of multiple people engaging in some form of cheating or dishonesty. Working with other students on an assignment is fine as long as everyone contributes and each student does their own work.
- **Any other activity that, to a reasonable person, looks wrong.** If you have any doubt whatsoever whether a certain action is considered dishonest, please ask me *before* engaging in the activity. There is no need to be embarrassed about asking, and I won’t penalize you for asking! In this class, if you follow the maxim “it’s easier to beg forgiveness than to ask permission”, don’t expect forgiveness to be forthcoming.

***If you engage in academic dishonesty during any graded activity, you will receive no credit for that activity. More than one instance of dishonesty by a student will result in automatic failure of the course and referral of the student for disciplinary action.***

For further information, search the Texas A&M-Commerce website for “academic integrity policy”.

SmartWork and LearningStudio provide me with tools that check for common forms of online cheating and collusion. These include, but aren’t limited to: time stamps, location stamps, and automated comparison of essay answers. I will use these tools.

### **Administrative Withdrawl**

Although I have the right to drop you for excessive absences, I won’t do so. You have a right to get an F if you decide to quit working but don’t withdraw.

### **Assignment Policy and Due Dates**

All assignments will be posted at least one week before they are due. Assignments and due dates will be posted in the main page for each unit. Submission requirements for each assignment will also be given on that page.

### **Dropping The Course**

A student may drop this course by logging into their myLEO account and clicking on the hyperlink labeled 'Drop a class' from among the choices found under the myLEO section of the Web page.

### **Incompletes**

I only offer incompletes in extraordinary circumstances. Any student interested in an incomplete should contact me as soon as possible after the situation arises, and should keep in mind that I am not required to give you an incomplete and so may not offer you the opportunity. You should also know that you only have access to an eCollege course for two weeks following the final day of term.

### **Late Work**

Late assignments are penalized 10% for each day late (including weekends), up to 70% penalty. After 7 days, any missing assignments will receive a zero. If you fail to take an exam, you will receive a zero.

### **Syllabus Change Policy**

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

## University Specific Procedures

### *Nondiscrimination Notice*

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

### *ADA Statement*

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

**Office of Student Disability Resources and Services**

**Texas A&M University-Commerce**

**Gee Library**

**Room 132**

**Phone (903) 886-5150 or (903) 886-5835**

**Fax (903) 468-8148**

[StudentDisabilityServices@tamuc.edu](mailto:StudentDisabilityServices@tamuc.edu)

### *Student Conduct*

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. (See *Code of Student Conduct from Student Guide Handbook*).

## COURSE OUTLINE / CALENDAR

The course will cover many of the topics outlined below. Pay attention to announcements in class for precise dates.

### *1<sup>st</sup> Unit: Life and Habitability*

- Chapter 1: Origins of Life
  - Scientific context of the search for life
  - Chemistry of life
  - Synthesis of organic material
  - Development of complex life
  - DNA and RNA
- Chapter 2: The Habitability of Earth
  - Defining habitability
  - Defining habitable zones
  - Early life on Earth
  - Extremophiles
- ***Exam 1***

## *2<sup>nd</sup> Unit: Habitable Worlds in our Solar System*

- Chapter 3: Mars
  - History, culture, and science fiction
  - The first searches for life
  - Following the water
  - Life in a Martian meteorite?
  - Preventing contamination
  - Possible habitats
- Chapter 4: Europa and other Icy Places
  - The icy satellites of outer planets
  - Evidence of water from Europa's surface
  - Chemistry of Europa's subsurface ocean
  - Subsurface habitats
- Chapter 5: Titan
  - Organic material on Titan
  - Titan's atmosphere
  - Titan's surface
  - Titan's subsurface ocean
- **Exam 2**

## *3<sup>rd</sup> Unit: Exoplanets*

- Chapter 6: Finding Exoplanets
  - Direct imaging
  - Transiting planets
  - The wobble method
  - Direct observations versus inferred properties
- Chapter 7: Properties of exoplanetary systems
  - History of exoplanet discoveries
  - Overall properties of planetary systems
  - Migration of planets
  - How common is our Solar System?
- **Exam 3**

## *4<sup>th</sup> Unit: Extraterrestrial Life*

- Chapter 8: Searching for life on exoplanets
  - Finding habitable environments
  - Observable signatures of life
  - Interstellar probes
- Chapter 9: Extraterrestrial Intelligence
  - History of searches
  - Listening for aliens
  - Communicating with aliens
  - The Drake Equation
  - UFOs and Close Encounters
  - Challenges of Interstellar Travel
  - Special Theory of Relativity
  - The Fermi Paradox

*Final Exam:*

- **Wednesday, Dec 16, 8:00–10:00**

*Optional Observatory Visits:*

- Total Lunar Eclipse: Mon Sept 28
- Tues Oct 13
- Thurs Oct 15