

Evolution of the Cosmos and Life

CLUSTER 70A – Winter 2020

Syllabus Subject to Change



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Course Description: In the Evolution Cluster we will explore the emergence of the universe and its contents — from the Big Bang to the formation of our solar system, and then the development of life on Earth. The emphasis is on the scientific process, answering the question “How do we know that?” and applying this to the astronomical, geological and biological processes that have shaped the evolution of our world from its beginning to the very recent arrival of humans. In the Fall quarter we will focus on the origins of the Universe through the formation of the Earth; in Winter quarter we focus on the evolution of life on Earth through our emergence as a species; and in the Spring quarter we will offer a collection of seminars that offer in-depth exploration of one or more topics discussed during Fall and Winter. *Our goal in this course, more so than teaching you scientific facts, is to help you learn how science gets done, so you are better able to evaluate science as it relates to your daily life in terms of news, politics, medicine, climate change, etc.*

Course Goals: Upon completion of this course you should be able to:

- Understand the distinctive characteristics of scientific inquiry as a connected web of knowledge
- Understand how scientific knowledge relates to your everyday life
- Explain basic evidence for the origin and evolution of the cosmos, the solar system, and the Earth
- Demonstrate a deeper understanding of your place in the Universe, both spatially and temporally
- Explain the origins of matter, the chemical elements, and your connections to the cosmos
- Discuss evidence for the age of Earth and planets
- Understand the basic physical and chemical properties of the Solar System

Special Considerations for Winter 2020: Due to ongoing concerns regarding COVID-19, this course will be taught differently than it has been in the past. All lectures and discussion sections will be conducted remotely. We promise to do our best to deliver an engaging and fun course despite the challenges from this virus. We ask that you, the student to please:

- Be flexible and patient with us and flexible as we adapt
- Refer back to this document throughout the course, as it will evolve as circumstances change

- Stay up to date on UCLA's response to COVID-19 through this [website](#)
- Additional resources for remote learning are [here](#)

Course Website. Use the course website on CCLE to stay updated with reading, quizzes, other assignments, and general announcements. You are also encouraged to use the Discussion Forum on the site to ask questions, coordinate study groups, or share something relevant to the course that you find interesting. Announcements will be made throughout the quarter via CCLE. Make sure you have an active email address in MyUCLA! *There are also resources on wellness, financial difficulties, communities, and academic help. Check them out!!!*

Required materials.

- *The Tangled Bank: An Introduction to Evolution*, 2nd Edition by Carl Zimmer; ISBN 1936221446
- *A Short History of Nearly Everything*, Bill Bryson; ISBN 076790818X

This course is part of the UCLA Inclusive Access program. Access to the Zimmer text is being automatically provided to you, digitally, through the course website/CCLE before the first day of class or upon enrollment. The materials are being provided at a reduced and highly competitive price (\$38.25 vs. nearly twice that if you purchase it yourself). You will receive an email from the UCLA Store with program details and cost sent directly to your email address on file with the UCLA Registrar. Check your spam folder if not received.

Everyone enrolled in this course is automatically a participant to start and will have access to the materials through 2nd week of class. Those remaining in the program after 2nd week will be billed for the materials directly to their BruinBill account and will continue to have access to the course materials. **If you do not wish to participate in Inclusive Access, you must opt-out by the Friday of 2nd week opt-out deadline or you will be charged.** Those who opt-out will lose access to the digital materials starting week 3. If you have questions, contact inclusiveaccess@asucla.ucla.edu

Lectures will be a combination of videos posted online as well as the scheduled times when we will meet live for lectures, Q&A, activities and review.

- We ask that you watch any videos posted before the scheduled class times so you are prepared to ask questions and participate in any activities. Slides will be posted on CCLE.
- We will record the sessions when we meet at the scheduled class time.
- Participation in the live lectures is encouraged. and we encourage questions; please use the Zoom hand-raising feature and un-mute yourself when I call on you.
- In order to make the course more engaging and interactive, we will periodically poll the class using Zoom's poll feature, put you in breakout rooms, have you use Google suite files, or other activities.
- You will get the most out of the class, both in terms of learning the content and the community, if you attend and participate in the live lectures.

Office Hours: All office hours are posted on the CCLE course page.

Administrative Issues: Please contact Dr. Friscia with any questions about course logistics.

Grading: This course will **not** be graded on a curve, meaning there is technically no limit to the number of A's that can be earned – if you all do very well, you can all get an A. We do this so as not to discourage cooperation. You should be working with your fellow students, so you can all do well! The letter grade cutoffs on the right show your *minimum* grade based on percentage of points earned, but we may also adjust these cutoffs *in your favor* at the end of the quarter depending on how well the class does as a whole (e.g., 88% may get you an A instead of a B).

Grading Breakdown	
Lab assignments / participation	30%
Writing Assignment	30%
Bi-weekly quizzes	30%
Reading Quizzes	10%
Total	100%

Grading Scale
A-, A : 90–100%
B-, B, B+ : 80–89.9%
C-, C, C+ : 70–79.9%
D-, D, D+ : 60–69.9%
F : ≤59.9%

Lab/Discussion Sections: Weekly attendance in sections is mandatory. Each section is two hours long and will meet on zoom. The activities in section are designed to help reinforce many of the topics you learn in class and give you an opportunity to ask questions and think about course topics in small groups.

Writing Assignment: You will receive credit for Writing II at the end of the year, so each quarter there will be a writing assignment due on Week 10. You will be guided through the writing process which will include a lesson on using the UCLA library and its resources, feedback on outlines and rough drafts, and peer review. Due dates for various parts of the writing assignment are shown on the lecture schedule. Make sure to take advantage of the various writing resources available to you! Developing your writing skill is as important as anything else you will learn at UCLA, so visit the Undergraduate Writing Center and your Inquiry Specialist Emery Grahill-Bland early and often to help guide you through the writing process.

Bi-Weekly Quizzes: In lieu of a high stakes midterm and final, we will administer five quizzes throughout the quarter to assess your mastery of the course material. This will be a combination of multiple choice and short answer questions administered over gradescope to be completed within a 24 hour window. Do not collaborate on these quizzes. In order to remain adaptable to unforeseen world events, we may postpone or cancel a quiz.

Reading Quizzes: Before most lectures there will be a short quiz (3-5 multiple choice questions) on the readings for that lecture. This is just to encourage you to read ahead of the lectures, and only make up a small fraction of your final grade.

Personal Problems: We understand that sometimes life makes it difficult to focus on schoolwork, especially with the current situation of a pandemic and economic crisis. If you are having a personal problem that affects your participation in this course, please talk to us to create a plan. Please do not wait until the end of the quarter to share any challenges that have negatively impacted your engagement and academic performance. The sooner we meet, the more options we will have available to support your overall academic success. If you are not comfortable speaking with me directly, please utilize the other student resources provided above in order to understand how to best approach success in this course given your personal needs as soon as possible.

Message about Academic Integrity to all UCLA Students from the UCLA Dean of Students: UCLA is a community of scholars. In this community, all members including faculty, staff and students alike are responsible for maintaining standards of academic honesty. As a student and member of the University

community, you are here to get an education and are, therefore, expected to demonstrate integrity in your academic endeavors. You are evaluated on your own merits. Cheating, plagiarism, unauthorized collaborative work, multiple submissions without the permission of the professor, or other kinds of academic dishonesty are considered unacceptable behavior and will result in formal disciplinary proceedings usually resulting in suspension or dismissal.

Alternatives to Academic Dishonesty

- **Seek out help** – meet with your TA or with one of us about the availability of special tutoring.
- **See a counselor at Counseling & Psychological Services** – UCLA has many resources for students who are feeling the stresses of academic and personal pressures.

Remember, **getting caught cheating affects more than just your GPA**. How will you explain to your parents, family and friends that you have been suspended or dismissed? How will it affect your financial aid award and/or scholarship money? Will you be required to, and able to pay back that money if you are no longer a student? How will it influence your admission to graduate programs?

If you would like more information, please see the Dean of Students' Office in 1206 Murphy Hall, call them at (310) 825-3894, or visit their website at www.deanofstudents.ucla.edu.

How to Succeed in this Course: We Expect Students to Develop a "Growth" Mindset. If you receive a bad grade on assessment do you believe it is because you are just not good at this subject? Or do you see it as an indication that you need to study a bit harder in order to do well next time? This is one small example, but you can absolutely change your mindset and approach challenges and successes to benefits your learning. We believe that all students have the ability to be successful in this course, and that failures or challenges should be viewed as learning opportunities. This includes those of you who would say that you're not a 'science person'. As you begin this course, please consider what you need to do to develop a growth mindset, and approach all course activities and assessments accordingly.

There are many ways for you to show us what and how you are learning through your preparation, participation in lectures and discussion sections, and performance on quizzes, exams, and written assignments. This class is structured to help you and your classmates get the support and guidance you need to succeed. This may feel like a LOT of work, but it is intended to encourage practices that will help you learn the material better, and that you can take with you throughout your college career and beyond. This is a 6-credit class, which means you are expected to work an average of 15-18 hours per week on it, with a suggested breakdown as follows:

Action	Description	Hrs/wk.
Ask questions!	Many of us don't like asking questions. We learn, however, that the smartest people we know are the ones who ask questions about anything that they don't understand. If you don't want to ask in class, ask in office hours, over the discussion forum, or in any other of the help resources.	0.5
Do any readings and watch any lecture videos before class	This will get you ready to learn the concepts in class. Before class you should read any provided texts, and watch any videos that we post. Do this actively, meaning without distractions so you can focus on what's being said. You may want to do this multiple times, once without taking notes, and again while take	3
Participate in live lectures	Rather than passively listening and writing notes, this is a class very much about YOU doing and thinking. Attending class will reveal what you thought you understood but actually don't quite understand. Come with questions and ready to interact with your fellow students. We will have questions for you to help you think more deeply about the material	2.5

Attend our office hours or your TAs	If you have unresolved questions, ask them on the course website, in office hours or in the Q&A session. Even if you think you understand the material, checking with someone is a great way to make sure.	1
Go to the discussion section	In your discussion sections your TAs will go over lab activities, help you with your writing and answer questions about course material. It's also a great place to get to know your fellow students!	2
Preparation for lab section	There will usually be some lab activity and/or a reading and questions for you to do before discussion section. Since there will be time in section devoted to discussion of these assignments, it's important to do them ahead of time	2
Preparation for and taking bi-weekly quizzes	The quizzes will be the primary way we will be assessing your grasp of the lecture material. You should take some time reviewing the material for the week before taking the quiz.	2
Writing Assignment	The writing assignment for the quarter will be 'scaffolded', meaning you will be turning in parts in stages - bibliography, outline, drafts, peer reviews, etc. So you will be working on it throughout the quarter.	2.5

Providing feedback to your instructors and your TAs: We encourage your feedback at any time throughout the quarter about things that are helping you learn, or things that aren't helping. Please communicate with an instructor or with your TA if there are ways that we can improve the course to better support student learning.

Please keep this syllabus easily accessible so that you can refer to it throughout the quarter. Contact any member of the teaching team with any clarifying questions in advance of the quarter or within the first week. We look forward to getting to know you and supporting your learning throughout this year!

Lecture Schedule

	Lecture Topics	Textbook Readings
Week 1	Lecture 1: Jan 5, Tues: Introduction to Evolution (Friscia) Lecture 2: Jan 7, Thurs: History of Evolutionary Thought (Friscia)	Chapter 1 Chapters 2
Week 2	<i>Research Paper</i> – <i>Topics chosen in lab section this week</i> Lecture 3: Jan 12, Tues: Geology, and the Fossil Record (Friscia) Lecture 4: Jan 14, Thurs: Building the Tree of Life (Friscia)	Chapter 3 Chapter 4
Week 3	<i>Mon Jan 18 – Martin Luther King, Jr. Day (NO LABS this week)</i> Lecture 5: Jan 19, Tues: Inheritance and DNA (Friscia) Lecture 6: Jan 21, Thurs: Population Genetics & Selection part I (Friscia) Quiz 1: Material through Lecture 4	Chapter 5 Chapter 6

Week 4	Lecture 7: Jan 26, Tues: Population Genetics & Selection part II (Frischia) Lecture 8: Jan 28, Thurs: Molecular Evolution (Brown) <i>Research Paper – Annotated Bibliography due Friday Jan 29</i>	Chapter 6 cont. Chapter 7
Week 5	Lecture 9: Feb 2, Tues: Adaptation (Brown) Lecture 10: Feb, 4 Thurs: Sex and Evolution (Brown) Quiz 2: Material through Lecture 8	Chapter 8 Chapter 9
Week 6	Lecture 11: Feb 9, Tues: Origin of Species (Brown) Lecture 12: Feb 11, Thurs: Macroevolution and History of Life (Frischia & Brown) <i>Research Paper – Rough Drafts due Friday Feb 12</i>	Chapter 10 Chapter 11
Week 7	<i>Mon Feb 15 – President’s Day (NO LABS this week)</i> <i>Research Paper – Mandatory meetings with grader this week</i> Lecture 13: Feb 16, Tues: Macroevolution and History of Life (Frischia & Brown) Lecture 14: Feb 18, Thurs: Coevolution (Brown) Quiz 3: Material through Lecture 12	Chapter 11 cont. Chapter 12
Week 8	Lecture 15: Feb 23, Tues: Evolution of Behavior (Brown) Lecture 16: Feb 25, Thurs: Human Evolution (Frischia)	Chapter 13 Chapter 14
Week 9	Lecture 17: Mar 2, Tues: Evolution and Medicine (Brown) Lecture 18: Mar 4, Thurs: Climate Change (Jewitt) Quiz 4: Material through Lecture 16	Chapter 15
Week 10	Lecture 19: Mar 9, Tues: Extraterrestrial Life & the End of the Universe (Petigura) Lecture 20: Mar 11, Thurs: SOAPBOX <i>Research Paper – Final Draft due Friday Mar 12</i>	
Finals Week	Quiz 5: Material through lecture 20	

Lab Schedule

Week 1 – Belief Systems and Evolution: Judgement Day & What About God?

Week 2 – Discussion: Belief Systems and Evolution

Week 3 – NO LABS

Week 4 – Simulating Evolution

Week 5 – *Fossils & Fossilization*

Week 6 – Cataloging the Fossil Record

Week 7 – NO LABS

Week 8 – *Jurassic Lark*

Week 9 – *Comparative Anatomy*

Week 10 – Cane Toads: The Story of an Invasive Creature (movie)

Other Possibility: *Are you Smarter than a dinosaur?*