

MHC 3xx: The Physical & Personal Universe: Exploring Outer Space through Science, Cultural Analysis, and Introspection

Professor: Emily Rice, CUNY & AMNH

Meeting Day & Time

Meeting Location

Email: Emily.Rice@mhc.cuny.edu

Office Hours: by appointment (MHC)

Course Description

Explore the Universe, from Earth and the Solar System to planets around other stars, stars, galaxies, and the Universe as a whole, through the lens of not only the physical sciences, but also the social sciences and humanities. This course will cover the structure, composition, and evolution of the Universe through time, as well as how we know those things (and what we still don't know). We will also explore how our human experiences influence our understanding of the Universe, and vice versa, in historical, cultural, and personal contexts. Students are expected to produce a self-defined creative and/or research work that reflects the convolution of the natural sciences covered in class with their exploration of the Universe incorporating their cultural background, personal experiences, and/or other valued aspects of their identity, and present it to the class as a demonstration of their achievement of the course goals. The seminar-style class will be "flipped", with the assigned material read/watched by students individually (or in study groups) before class, and in-class time focused on discussion and activities expanding on that material and synthesizing it with students' contributions. This is an honors course because of 1.) the breadth of content covered in one semester and 2.) the expectation of an interdisciplinary, student-guided project synthesizing and extending upon course material.

Prerequisite: MHC 255 (Science Forward) and two semesters of science courses (any level), or permission of the instructor.

Learning Goals

- Develop a functional understanding of planets, stars, galaxies and the Universe: what they are made of (composition), how they are distributed (structure), and how they change with time (evolution)
- Practice critical analysis, reasoning with evidence, and creative expression and apply those skills to exploring the Universe
- Monitor and evaluate your own learning and expression
- Conceive, plan, and implement an interdisciplinary projects that both demonstrates of mastery of and extends upon an aspect of the course content

Student Responsibilities

- Complete assigned readings &/or videos before each class, respond to prompts, and generate questions for further discussion
- Participate in discussions before, during, and after class

- ❑ Design, plan, implement, and present an a project on an aspect of the Universe that incorporates both the physical and social sciences or humanities
- ❑ Provide thoughtful and constructive feedback on classmates' work

Grading Policy

<p>Grades will be earned as follows:</p> <ul style="list-style-type: none"> ● 30% – Class Preparation & Participation ● 20% – Weekly Assignments ● 20% – Universal Field Journal ● 30% – Creative Exploration Project (including formative milestones & summative presentation) 	<p>Approximate minima for letter grades:</p> <ul style="list-style-type: none"> ● A: 90% ● B: 75% ● C: 60% ● D: 50%
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Required Resources

- *Astronomy* (OpenStax): <https://openstax.org/details/books/astronomy>
 - Download the PDF (154 MB)
 - We will cover 2-3 chapters per week
- *Crash Course Astronomy* (PBS Digital Studios): <https://youtu.be/0rHUDWjR5gg>
- Other readings, videos, and materials as assigned during the semester
- Relevant popular science-level book of your choice (from list of suggestions or approved by professor)

Course Schedule

	Date	Class Topic - each class will have an astronomy topic and a social/cultural topic	Chapters in Astronomy	Assignments
1		The Known Universe & <i>Astronomy in everyday life</i>	1, 2	
2		Tools for Exploring the Universe & <i>How can we know for sure?</i>	3, 5, 6	
3		Earth as a Planet & <i>Culture of climate change</i>	4, 8	
4		Planets in the Solar System & <i>"Local" science fiction</i>	7, 9, 10, 11	
5		Asteroids, Comets, Moons, and Rings in the Solar System & <i>Public perception of space</i>	12, 13, 14	
6		The Sun as a Star & <i>Cultural significance of astronomy</i>	15, 16	

7		Stars & <i>Gender equity in the sciences</i>	17, 18, 19	
8		Creative Project Workshop		
9		Planets Around Other Stars & Astrobiology	21, 30	
10		Stellar Formation and Evolution	20, 21	
11		Stellar Death and Remnants	23, 24	
12		Galaxies	25, 26, 27	
13		The Universe & the Anthropic principle	28, 29	Prepare Creative Project Presentation
14		Final Presentations		Complete Creative Project

Assignment Descriptions and Timelines

You are expected to complete all assignments on time or communicate with the instructor about any delays. *Late work will not be penalized as long as you communicate with the instructor in advance of the deadline.*

Class Preparation and Participation – 30% of course grade

Participation includes completing the reading response questions at the beginning of each class, attending the synchronous meetings of class, being actively engaged in the synchronous (in class) and asynchronous (outside class, as necessary) discussions in some format, contributing to activities in class, and communicating with me promptly and effectively. I will assess participation at the end of each class and at the end of the semester. If you have concerns about my ability to fairly assess your participation in class and/or group work, please communicate with me individually.

Weekly Assignments – 20% of course grade

There will be a variety of weekly assignments following each class meeting, sometimes started during our synchronous class meeting, optimally to be completed before the next synchronous meeting. Examples may include completing a worksheet, creating a graphic or chart, or providing comments on classmates' work (including their Universal Field Journal entries and components of their Creative Exploration Projects, described below). Your lowest score on these assignments will be dropped.

Universal Field Journal – 20% of course grade

This component of the course is your opportunity to discover, engage with, and evaluate scientific and cultural understanding of the Universe in everyday life. Your Universe Field Journal will consist of 10 entries posted to the course blog, each describing and critiquing an example of some aspect of the Universe (exo/planets, stars, nebulae, galaxies, cosmology, etc.) you identified and explored with (i.e., read, watched, attended, played, made, wore, etc.). A complete entry will include a detailed description of the example and your evaluation of the successes and shortcomings of the example in terms of representing scientific and cultural understanding of the Universe. Each entry should contain at least one image and five relevant tags. Five entries should be from required categories (popular science book, video, podcast, television show, live virtual event), and five others should be from outside those categories (e.g. art work or exhibit, theater/dance performance, zine, baby/kids books, [more suggestions here](#)). You should plan on completing these regularly during the semester, not wait until the end, so that your classmates can read and comment on them.

Creative Exploration Project – 30% of course grade

This project is an opportunity to incorporate everything you learn during the semester into a capstone project motivated by your own interests. Specific milestones will be defined and assigned along the way, and at least one synchronous class will be dedicated to workshopping the projects with your classmates. You are expected to work individually on the project, explicitly defining the format, medium, audience, scope, content, goals, and assessment. More details will be provided as the semester progresses.

Accessibility and Accommodation

To the best of our ability, materials used in this course will be accessible to you. Videos in the Science Forward Video Series have closed captioning (when viewed via YouTube), written transcripts, and are available with audio descriptions of the visual content. If you are having trouble accessing any of the assigned readings or videos, let me know and I will address the issue.

Please make an appointment to see me if you have a disability that requires accommodation for participation in this course. I will make every effort to accommodate your needs. Students with disabilities are also encouraged to contact the Accessibility Center at your home campus (e.g., [CCNY AccessAbility Center](#)) for additional assistance.

Anti-Harassment Statement

In order to maintain an environment conducive to personal and intellectual growth, harassment of any kind is prohibited in our classroom and on our course site. CCNY's Office of Affirmative Action, Compliance, and Diversity has additional policy information [here](#). CUNY's policy on sexual misconduct can be found [here](#).

The University strictly prohibits the use of University online resources or facilities, including our course site, for the purpose of harassment of any individual or for the posting of any material that is scandalous, libelous, offensive or otherwise against the University's policies. For online interactions that happen through our course, we will follow the CUNY School of Professional Studies guide to an online academic setting available [here](#).

Academic Integrity

Academic dishonesty is unacceptable and will not be tolerated. Cheating, forgery, plagiarism and collusion in dishonest acts undermine the educational mission of the City University of New York and the students' personal and intellectual growth. You are expected to know and follow the guidelines put forth in the Macaulay Honors Pledge (available [here](#)) and CUNY's Policy on Academic Integrity (available [here](#)).