



UNIVERSITY of
DENVER

NATURAL SCIENCES & MATHEMATICS

University of Denver • Fall 2021 • First Year Seminar (FSEM)

The Science of Science Fiction

CLASS MEETINGS

Mon Wed 2-3:50 pm STURM 234

INSTRUCTOR

Prof. Scott Horowitz

Email: scott.horowitz@du.edu

Instructor Office Hours: 4-5 PM Wed, 3-4 PM Fri in ECS 561

LEARNING OUTCOMES

1. Learn and apply independent scientific research, writing, and presentation skills using science fiction as a medium.
2. Develop skills for navigating college through training in professional development and well-being.
3. Students who complete FSEM will be able to engage in critical inquiry in the examination of concepts, texts, or artifacts; effectively communicate the results of such inquiry; and access University resources.

COURSE DESCRIPTION

Science fiction is the medium through which humans imagine the future, enabling us to extrapolate and envision different trajectories for our world, as well as examine the problems facing our society today. The science component of science fiction is a critical piece that enables this examination, as well as providing a method for conceptualizing new technology and advancing science.

This FSEM course delves into the genre of science fiction from the perspective of the science. We will examine the role of science fiction in science and society, and study the science of the present and future through the interdisciplinary lens of science fiction, including film and literature. Topics will be weighted towards the science and science fiction of biology (such as genetic manipulation) and chemistry (such as advanced materials), but will also cover topics within physics and computation. Through creative science fiction and analytical science writing, in-class discussions, independent research, presentations, and participation at a science fiction conference, students will develop critical thinking, writing, and communication skills. In addition, this course will devote time to students' academic and professional development.

Students will prepare for their academic future as well as learn strategies for networking and advancement in their field.

COURSE REQUIREMENTS

1. Attendance (5%)
2. In class participation (10%)
3. Weekly reflections (10%)
4. Reading/watching quizzes (10%)
5. MileHiCon prep and reflection (15%)
6. Scientific analysis writing assignment (25%)
7. Creative sci fi based in science (25%)

COURSE EXPECTATIONS

Participation: Students are expected to read/view assigned material before class (and do reading quiz) to enable full participation points. All students are expected to participate in every class, and to participate equally in group work. Class discussions are expected to remain entirely respectful, as described below. Weekly reflections will be considered part of the participation grade.

Classroom discussion norms: This class as well as the university as a whole is made up of people from diverse backgrounds, including ethnicity, religion, beliefs, sexual orientation, political views, among many other important categories. It is imperative that all interactions are respectful of these differences. Differences in student beliefs will come to the fore in this class. No tolerance for disrespect of your peers will be allowed, and will be subject to a loss of participation points beyond a single day's worth of participation.

Class norms for discussion include the following:

- Listen actively and attentively
- Ask for clarification if confused
- Assume ignorance instead of malice
- Critique ideas, not people
- Challenge each other, but only respectfully
- Do not interrupt
- Build on each other's comments and work towards a shared understanding
- Be aware if you are talking a large amount to let others have their say
- Avoid any putdowns, even those that are meant as a joke
- If you are offended, acknowledge it immediately
- Keep classroom comments confidential
- Use evidence to support your arguments
- Be ready with materials needed for discussion (i.e. readings, often times laptops)

Reading quizzes: For each outside reading/viewing assignment, expect a short Canvas quiz to be completed before class.

MileHiCon prep and reflection: MileHiCon is a local science fiction convention. Students will be required to attend at least one session. For this session, you are required to research the topic of the session and the presenters, and prepare at least one question to be asked at the session. For the reflection, you are required to re-examine your preparation and question, and whether the discussion at the session followed your expectations.

Course and professional development plan: This assignment encompasses two parts 1) An intended course plan laying out your entire college career with your anticipated major, and 2) A plan for developing career resources and networking over that plan.

Scientific analysis writing assignment: For this assignment, you will analyze the science in a piece of science fiction. In this assignment, you will 1) identify the novum, 2) list and analyze what specific scientific advances are required to bring it about, 3) evaluate the current state-of-the-art on this scientific topic, and 4) provide an informed opinion on whether the science will be achievable as depicted in this novum. Correct scientific citation usage is required. Length is 1,000-1,500 words, not including references.

Choices for sci-fi to analyze (if you have another piece of sci-fi you very much want to write about, please see me to discuss):

- 12 Monkeys (1995): can choose either virology or time travel novum (not both).
- Nightfall by Isaac Asimov (the short story, not the novel): can choose either astrophysics or human evolution novum (not both).
- Ex Machina (2015)

Sci-fi creation assignment: In this assignment, you will create an original “hard” science fiction written story (1,000-2,000 words), accompanied by a brief reflection on it (400-600 words, not including references). The story must have an identifiable novum that is based in science. If you would highly prefer a different creative modality than a short story, please see me to discuss. The reflection must be a shorter version of the scientific analysis writing assignment with all of the same components.

Lecture and Testing Accommodations: I will accommodate students diagnosed with a learning disability to the best of my ability, and in confidence. However, I require students to inform me of any accommodations needed in the first week of class. For further information, please see the University Disability Services’ website at <http://www.du.edu/disability/dsp/index.html>. The Disability Services Programs (DSP) is located on the 4th floor of Ruffato Hall, 1999 E. Evans Ave. DSP can be contacted by calling 303.871.2372 or by emailing dsp@du.edu.

Religious Accommodations: Religious holy days are eligible for excused absence as per University policy, unless the accommodation would cause undue hardship. I will do my best to accommodate requests if they are done in advance of your absence. Please make any requests by the end of the first week of class.

Academic Dishonesty: In this class, the Honor Code of the University of Denver will be strictly enforced. For your reference, the link to the Honor Code Student Conduct Policy and Procedures is: <http://www.du.edu/studentlife/studentconduct/>.

Academic Advising: As your First-Year Seminar instructor, I am also your academic advisor and mentor for this first year (and later as needed). I will meet with each of you during each quarter for advising and registration. In addition, this course has significant time set aside for professional development and advanced course planning during class time.

Readings/Films to access

Films: All of the films used in the course are available via Swank and Kanopy through DU. Robot & Frank and The Man in the White Suit are available through Kanopy <http://du.idm.oclc.org/login?url=http://du.kanopystreaming.com>, and Gattaca and Jurassic Park are available through Swank <http://du.idm.oclc.org/login?url=https://digitalcampus.swankmp.net/udenver333780/>. Physical copies of several of these are also available on reserve at the library.

Readings: For readings, you will need to purchase/procure copies of Beggars in Spain (make sure you get the novella version and not novel version), and Anxiety is the Dizziness of Freedom, which is part of the larger anthology Exhalation by Ted Chiang. Both are available at the bookstore, but Anxiety is the Dizziness of Freedom will also have a pdf version on Canvas. Note that if you get Beggars in Spain not from the bookstore, there are two versions. We are using the **novella** version, not the novel version. There is a single copy of each also on reserve at the library.

LATE WORK/EXAM AND ATTENDANCE POLICY

Late written assignments are penalized 10% for each day past the deadline. Except under extraordinary circumstances (e.g. a doctor's note is required for illness), class presentations cannot be made up.

If you are unable to attend class due to a legitimate emergency or illness, please contact me via e-mail. If you are not in class for any other reason, you will be marked absent and earn a zero for the day. Students who arrive more than five minutes late will earn 50% attendance for the day.

Course Timeline:

Week 1

Sept 13th: What is science fiction and why does it matter?

Sept 15th: Financial health

Week 2

Sept 20th: The scientific method

- Assigned reading: My Home My Galaxy: How We Learn About Galaxies, and the Power of Inference

- Assigned reading: The Importance of Stupidity in Scientific Research
- Sept 22nd: How to find and read scientific literature

Week 3

Sept 27th: Genetics part 1: Gattaca

- Assigned viewing: Gattaca (1997)

Sept 29th: Developing a professional development plan

- Topic choice for analysis assignment due
- MileHiCon prep due, MileHiCon is Oct 1-3.

Week 4

Oct 4th: Genetics part 2: Jurassic Park

- Assigned viewing: Jurassic Park (1993)
- MileHiCon reflection due

Oct 6th: Physical health and sexual assault awareness and peer editing

- First draft of science analysis piece due

Week 5

Oct 11th: The neuroscience of sleep

- Assigned reading: Beggars in Spain (novella)

Oct 13th: Mental and emotional well-being

- Science analysis piece due

Week 6

Oct 18th: Microbiome

- Assigned reading: Inoculation

Oct 20th: Developing a course plan and academic mentoring

- First draft of novum for creative piece due

Week 7

Oct 25th: Artificial intelligence

- Assigned viewing: Robot & Frank (2012)

Oct 27th: Creative writing workshop and group sci-fi choice for Week 10

- Second draft of novum due.

Week 8

Nov 1st: Quantum mechanics

- Assigned reading: “Anxiety is the Dizziness of Freedom” (novella)

Nov 3rd: Diversity in higher education and the workplace

Week 9

Nov 8th: Materials chemistry

- Assigned viewing: The Man in the White Suit (1951)

Nov 10th: Community engagement

Week 10

Nov 15th: Presentation of creative works

Nov 17th: Presentations of creative works

- Creative writing piece due