

FYSE 130: Apocalypse to Warp Drive: Physics in Film

Fall 2019 ♦ MWF 9:00-9:50 ♦ RITA 363

Instructor: Dr. Chris Fragile ♦ fragilep@cofc.edu

Office hours: TuW 3:00-4:00 ♦ table outside RITA 387

Peer facilitator: Reilly O'Grady ♦ ogradyrj@g.cofc.edu

FYSS 101: Th 6:05-6:55 ♦ BELL 400

A 3-credit course which uses popular media, particularly movies, as a basis for teaching fundamental principles of physics such as force, momentum, energy, power, heat, temperature, and relativity. Movies are a great tool for this purpose, because while some filmmakers do a good job of sticking to the laws of physics, many blatantly ignore them. By the end of the course, students should be able to distinguish good movie physics from bad and recognize physics principles in the world around them.

FYSE LEARNING OBJECTIVES

At the end of the semester, students should have the following skills:

Campus Resources

- Identify and use the appropriate academic resources and student support services at College of Charleston. These would include the Addlestone library, information technology, the Center for Student Learning, the Career Center, and other appropriate academic resources, student support services, and cultural resources.

Information Literacy

- Use appropriate tools and search strategies for identifying particular types of information specific to the discipline
- Evaluate the relevance, quality, and appropriateness of different sources of information
- Recognize and classify the information contained within a bibliographic citation
- Access and use information ethically and legally

Integrative Learning

- Use appropriate critical thinking skills and problem-solving techniques in appropriate disciplinary contexts
- Make connections across disciplines and/or relevant experiences

REQUIRED MATERIALS

Don't Try This At Home: The Physics of Hollywood Movies, Weiner, A., Kaplan Publishing (New York) 2007.

Insultingly Stupid Movie Physics, Rogers, T., Sourcebooks Hysteria (Naperville, IL) 2007.
Scientific calculator

CliftonStrengthsAccess Code is required for FYSS 101

MATERIALS ON RESERVE IN LIBRARY

Hollywood Science: Movies, Science & the End of the World, Perkowitz, S., Columbia University Press (New York) 2007.

The Physics of Superheroes, Kakalios, J., Gotham Books (New York) 2005.
The Physics of Star Trek, Krauss, L. M., Basic Books (New York) 1995.
Beyond Star Trek: Physics from Alien Invasions to the End of Time, Krauss, L. M., Basic Books (New York) 1997.
The Sum of All Fears, Clancy, T., G. P. Putnam's Sons (New York) 1991.

WEB-ACCESSIBLE RESOURCES

Hollywood Science: Movies, Science & the End of the World, Perkowitz, S., Columbia University Press (New York) 2007.
The Science of Superheroes, Gresh, L. & Weinberg, R., J. Wiley (Hoboken, NJ) 2002.
Bad Astronomy, Plait, P. C., John Wiley & Sons (New York) 2002.

REQUIRED WORK

attendance	5%
homework/informal blog posts	15%
project/formal blog post	20%
major tests (x3)	30%
final exam	20%
synthesis seminar (FYSS 101)	10%

Homework

You will have weekly homework assignments, each one related to the “feature film” and physics topic of the week. These will be a mix of informal blog posts and short problem sets. Late homework will be penalized 5% per day.

Project

Later in the semester you will have to choose your own movie scene to analyze. You will be required to review the physics with me, capture the relevant clip from your movie, and create a formal blog post, including your video clip and a review of the physics of the clip. You will be required to work with the campus Writing Lab for part of this project.

Tests

We will have three in-term tests plus the final exam. The tests will be made up of a variety of question types: multiple choice, short answer, and numerical problems. I will always try to have graded tests back to you by the next class period. If you suspect I made an error grading your test, please bring it to my attention before the next class after the one in which the graded tests are handed back.

Final exam: Monday, Dec. 9, 8:00-11:00

Synthesis Seminar, FYSS 101

As an FYE student, you are required to attend the FYSS 101 Peer Facilitator classes every week. 10% of your final grade in this seminar is the successful completion of the synthesis

sessions. After 4 absences (excused and unexcused) you will be dropped from FYSS 101 and will be required to re-take your FYE. This is a graduation requirement.

Extra credit

To encourage you to make the most of your College of Charleston experience, you will be given 0.2% extra credit (up to 10%) for every item you complete this semester from the list of 70 Things to do at the College of Charleston before you Graduate. Please turn in some form of proof (ticket stub, receipt, photograph, ...) or take me along to receive credit. I encourage you to do this throughout the semester, rather than saving a bunch of things to turn in at the end of the semester.

COURSE POLICIES

Attendance

Attendance in lecture, movie screenings, and synthesis seminar is mandatory. Attendance will be taken and will count toward your grade in the course. If you must be absent, you are still responsible for material covered on those days. You are also responsible for turning in any assignments that are due. Failure to attend class on the day an assignment is given or due does not mean that you may turn it in late without penalty. If you must miss class for a legitimate reason, please contact the office of the Associate Dean of Students (67 George Street) to get it documented. After I am notified by the Dean's office I will make a determination whether you get an excused absence or a zero for any late or missed material.

Cultural

Be generous, courteous, and kind. Turn off your phones and put them away. Laptops and tablets may only be used for note taking and you must discuss this with me before use can start.

Tardiness is rude. Please be polite by being on time.

Grading scale

	>92.5% A	89.5-92.5% A-
86.5-89.5% B+	82.5-86.5% B	79.5-82.5% B-
76.5-79.5% C+	72.5-76.5% C	69.5-72.5% C-
66.5-69.5% D+	62.5-66.5% D	59.5-62.5% D-
	<59.5% F	

Center for Student Learning

I encourage you to utilize the Center for Student Learning's (CSL) academic support services for assistance in study strategies and course content. They offer tutoring, Supplemental Instruction, study skills appointments, and workshops. Students of all abilities have become more successful using these programs throughout their academic career and

the services are available to you at no additional cost. For more information regarding these services please visit the CSL website at <http://csl.cofc.edu> or call (843)953-5635.

Disability Services

The College will make reasonable accommodations for persons with documented disabilities. Students should apply at the Center for Disability Services / SNAP, located on the first floor of the Lightsey Center, Suite 104. Students approved for accommodations are responsible for notifying me as soon as possible and for contacting me one week before accommodation is needed.

Honor Code

Violations of the College of Charleston Honor Code (including cheating or attempted cheating) will be referred to the Office of Student Affairs for adjudication. Examples of cheating relevant to this course include copying test answers, using cellular technology to communicate information during a test, or copying homework answers verbatim from an external source.

Campus Closure

If the College of Charleston closes and members of the community are evacuated due to inclement weather, students are responsible for taking course materials with them in order to continue with course assignments consistent with instructions provided by faculty. In cases of extended periods of institution-wide closure where students have relocated, instructors may articulate a plan that allows for supplemental academic engagement despite these circumstances.

COURSE CALENDAR
(subject to change)

Date	Topic	Don't Try This...	ISMP
Week 1 8/21-8/23			
Week 2 8/26-8/30	1D & 2D Kinematics Feature film: <i>Mission Impossible III</i>	Ch. 1	Ch. 1
Week 3 9/2-9/6	Hurrication		
Week 4 9/9-9/13	Conservation of Momentum Feature film: <i>Eraser</i>	pp. 49-56	Ch. 12
Week 5 9/16-9/20	Conservation of Energy Feature film: <i>Armageddon</i>	pp. 57-82	Ch. 7
Week 6 9/23-9/27	Newton's Laws of Motion Feature film: <i>Ad Astra</i>	Ch. 2	Ch. 5
9/27	Test #1		
Week 7 9/30-10/4	Uniform Circular Motion Feature film: <i>2001: A Space Odyssey</i>	Ch. 4	Ch. 15
Week 8 10/7-10/11	Feature film: <i>The Day After Tomorrow</i>		Ch. 14
10/14	Fall break		
Week 9 10/16-10/18	Temperature & Heat No feature film	pp. 130-143	Ch. 17
Week 10 10/21-10/25	Fluids No feature film	pp. 115-130	
10/23	Test #2		
Week 11 10/28-11/1	Nuclear Physics Feature film: <i>Fat Man, Little Boy; Gojira</i>	pp. 225-230 Ch. 5 of <i>Hollywood Science</i> Ch. 35, 36 & "Afterward" of <u>Sum of All Fears</u>	
Week 12 11/4-11/8	Space Physics Feature film: <i>The Martian</i>	Ch. 24 of <u>Bad Astronomy</u>	
Week 13 11/11-11/15	Special Relativity Feature film: <i>Contact</i>	Ch. 14-16 of <u>The Science of Interstellar</u>	
Week 14 11/18-11/22	General Relativity Feature film: <i>Interstellar</i>		
11/25	Test #3		
11/27-11/29	Thanksgiving break		

Date	Topic	Don't Try This...	ISMP
12/9	Final Exam - 8:00-11:00		