

FYSE 130: Apocalypse to Warp Drive: Physics in Film

Fall 2017 ♦ MWF 10:30-11:20 ♦ HWWE 111
Dr. Chris Fragile ♦ fragilep@cofc.edu
Office hours: MW 2:30-4:00 ♦ JC Long 207

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.

Student Learning Outcomes: By the completion of this course, a student will be able to:

1. Identify and use the appropriate academic resources and student support services at College of Charleston.
2. Use appropriate tools and search strategies for identifying particular types of information specific to the discipline.
3. Evaluate the relevance, quality, and appropriateness of different sources of information.
4. Recognize and classify the information contained within a bibliographic citation.
5. Access and use information ethically and legally.
6. Use appropriate critical thinking skills and problem-solving techniques in appropriate disciplinary contexts.
7. 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

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%
midterm exams (x2)	30%
final exam	20%
synthesis seminar	10%

Homework

You will have weekly homework assignments, each one related to the “feature film” of the week. These may take the form of informal blog posts or more traditional physics 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 two 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: Friday, Dec. 8, 8:00-11:00

Synthesis Seminar

Your performance and attendance in the Synthesis Seminar associated with this course will count toward your grade.

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 50 Things to do at the College of Charleston/in 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.

COURSE CALENDAR
(subject to change)

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

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