Course Description

San José State University
Dept. Physics & Astronomy
Phys 123 (Physics of Animation) Spring 2016

[Link to Instructor Info](https://sjsu.instructure.com/courses/1186269/pages/contact-info) [Link to Course Calendar](https://sjsu.instructure.com/courses/1186269/assignments/syllabus)

**Course Description** An introduction to the principles and concepts of physics relevant to animation and special effects. This course fulfills Area R (Earth and Environment) of SJSU Studies.

**Who Should Take This Course?** Animation / Illustration majors (ideally concurrent with Ani 114); Film majors; non-science majors interested in physics and in animation / special-effects. Science and engineering majors will not find this course to be useful because they cover the same physics in their required courses.

**Goals** In this course you will cultivate knowledge of the scientific study of the physical universe and its life forms by learning how realistic worlds are created in the realm of animation. You will also come to understand and appreciate the interrelationship of science and human beings to each other by discovering the importance of physics, especially mechanics and optics, in the creation of animation art.

**Prerequisites** Course prerequisites are completion of core GE, satisfaction of WST, and upper division standing. Students are strongly encouraged to satisfy GE Areas R, S, and V with courses from departments other than the major department. Completion of, or co-registration in, a 100W course is strongly recommended. A minimum aggregate GPA of 2.0 in GE Areas R, S, & V shall be required of all students. Note that these prerequisites apply to any "SJSU Studies" course (go here for details).

**Required Materials** There is no textbook in this course; all course materials will be posted on this website. Several assignments use public-domain software or trial versions of applications so you will need access to a personal computer (of any type) on which you can install software. Recommend that you download Adobe Creative Cloud (http://its.sjsu.edu/services/software/adobe/index.html), which is available for free to SJSU students. Several assignments require creating short digital video clips so you will need access to a digital camera; note that most compact cameras have the option of recording video. Video equipment may also be checked out from Media Services (http://www.sjsu.edu/at/msl), located on the ground floor of the Instructional Resources Center (IRC).

**Class Structure** This hybrid class is primarily on-line; it consists of video tutorials with associated quizzes, homework assignments, and term papers all organized into modules. The class does meet roughly every other Thursday at 6pm in Science 258; see the Syllabus for the schedule.

**Grades** Your grade will be based on the number of experience points (XP) that you accumulate by the end of the course. These points are mostly earned from Assignments.
There are also numerous Extra Credit opportunities.

Course grade versus total XP is tabulated below.

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**Student Learning Objectives / Course Objectives** Upon completion of the course, you will be able to:

**Student Learning Objective 1:** Demonstrate an understanding of the methods and limits of scientific investigation.

Course Objective 1: Demonstrate an understanding of the methods used in physics, specifically experimental observation and hypothesis analysis, in studying the real world by applying these methods of observation and analysis to animated worlds.

Assessment of Objective 1: Term Paper (The Laws of Physics in an Animation Universe); Homework and Final Exam Questions

**Student Learning Objective 2:** Distinguish science from pseudo-science.

Course Objective 2: Distinguish correct physical phenomena versus artificial, unrealistic effects in examples from animation, in particular with regard to commonly held misconceptions and pseudo-scientific notions (e.g., perpetual motion machines).

Assessment of Objective 2: Term Paper (Science Fact or Cinematic Fiction?); Homework and Final Exam Questions

**Student Learning Objective 3:** Apply a scientific approach to answer questions about the earth and environment.

Course Objective 3: Apply the principles and methods of physics in the quantitative analysis of animation and special effects.

Assessment of Objective 3: Analysis Assignments; Homework and Final Exam Questions.

**Course Requirements and Assignments**

SJSU classes are designed such that in order to be successful, it is expected that students will spend a
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SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in University Policy S12-3 at http://www.sjsu.edu/senate/docs/S12-3.pdf.

Diversity and Civic Learning Animation is popular around the world and its varying styles are culturally distinctive. In this course we will compare and contrast these styles, paying particular attention to how the universe is portrayed (e.g., how the laws of physics are obeyed or violated) in animation work from a broad spectrum of countries and societies. Animation is not limited to entertainment; it has also been a powerful tool for education, communication, and societal change, as you will discover in many of the examples screened and discussed in class (e.g., Every Child (1979), The Man Who Planted Trees (1987)).

Ethics Your own commitment to learning, as evidenced by your enrollment at San Jose State University and the University’s integrity policy, require you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development (http://www.sjsu.edu/studentconduct/). The policy on academic integrity can be found on their website.

Plagiarism is the use of someone else’s language, images, data, or ideas without proper attribution. It is a very serious offense in both academic and professional environments. In essence, plagiarism is both theft and lying: you have stolen someone else’s ideas, and then lied by implying that they are your own.

Learning when to cite a source, and when not to, is an art, not a science. However, here are some examples of plagiarism that you should be careful to avoid:

- If you use a sentence (or even a part of a sentence) that someone else wrote and do not reference the source, you have committed plagiarism.
- If you paraphrase somebody else’s theory or idea and do not reference the source, you have committed plagiarism.
- If you use a picture or table from a web page or book and do not reference the source, you have committed plagiarism.
- If your paper incorporates data someone else has collected and you do not reference the source, you have committed plagiarism.

The SJSU library has a tutorial (http://tutorials.sjlibrary.org/tutorial/plagiarism/index.htm) that explains how to identify and avoid plagiarism.

Speaking of attribution, the material in this section and in the next two are courtesy of the Office of Undergraduate Studies and Academic Senate policies.

Disabilities If you need course adaptations or accommodations because of a disability, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities register with Accessible Education Center (http://www.sjsu.edu/aec/) to establish a record of their disability. Go here (http://www.instructure.com/accessibility) for Canvas accessibility info.

Emergencies If you hear a continuous alarm or are told to evacuate the building, walk quickly to the nearest stairway at the end of each hall. Do not use the elevator. Take your personal belongings with you. Be quiet.
and follow instructions. Move away from the building and do not return until informed by police or coordinators.