DAWSON COLLEGE

PHYSICS
Complementary course
The Physics of Hollywood

203-BWT-03 section 00001
Fall 2016

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Pre-requisites None

Co-requisites None

Ponderation 3-0-3 (3 hours of lecture and 3 hours of work outside class per week)

Course objectives The objective of this course is to enable students to understand the general nature of current issues in science and technology and to explain some of these issues. To this end, students should learn how to characterize typical scientific thought processes and methods, illustrate how science and technology are complementary, explain the context and stages involved in some scientific and technological discoveries, and to deduce various consequences and questions arising from certain recent scientific and technological developments.

Course competencies At the conclusion of the course, each student will be able to produce a 750-word paper giving a written commentary presenting a scientific discovery or technological breakthrough. This commentary would give a brief explanation of the characteristics essential to scientific thinking, enumerate and briefly describe those of each major step in typical scientific process. It would contain definitions of the terms used and a description of the major relationships and logical and temporal links between science and technology. This commentary would also give a pertinent and coherent correlation of various scientific and technological discoveries and the surrounding context, enumerating the major steps involved in the discoveries. Finally, it would describe briefly the major consequences and challenges currently arising from these discoveries, and formulate pertinent and plausible elements of responses to them.

Evaluation The Institutional Student Evaluation Policy (ISEP) is designed to promote equitable and effective evaluation of student learning and is therefore a crucial policy to read and understand. The policy describes the rights and obligations of students, faculty, departments, programs, and the College administration with regard to evaluation in all your courses, including grade reviews and resolution of academic grievance. ISEP is available on the Dawson website.

Course notes and log book	10%
Quizzes	30%
Class work	30%
Group assignment	10%
Term project	20%

[†]Your teacher will provide a tentative test schedule during the first week of class.

Notes:

- At the end of every theme (approx. 2 weeks) there will be a quiz on the material in that theme. Dates for the quizzes will be announced at least one class in advance.
- On a regular basis, students will be asked to complete small in-class assignments and activities.
- The due dates for the term project (including elements that may be required before the final project is due) will be specified by your teacher in the first full week of classes.

The student should be able to demonstrate a general understanding of the physical principles examined in each topic/theme, and to use this understanding to analyze the science portrayed in selected movies and television shows. Students will also produce one essay that is consistent with the level of a college student. In order to pass the course an average grade of 60% is required, calculated according to the evaluation scheme above.

Reference materials

- **No required text book**. Hand-outs will be distributed in class or posted online.
- Reference texts:
  1. Fantastic Voyages: Learning Science through Science Fiction Films (2nd ed.), Dubeck, Moshier & Boss, Springer-Verlag, 2004 (full text available on Google Books)
  2. The Physics of Star Trek and Beyond Star Trek, L.M. Krauss, Harper, 1995 (partial text available on Google Books)
  3. The Physics of Superheroes, J. Kakalios, Gotham Books, 2005
  4. Physics for Poets (5th ed.), R. H. March, McGraw-Hill, 2003

Teaching methods

The material will be presented using a mix of active learning activities, lectures, in-class problem solving, laboratory experiments and demonstrations. Laboratory periods will be used for experiments as well as class tests and lectures.

Attendance & participation

Although class attendance is not compulsory, students should make every effort to attend all classes. In the event that a class is missed, the student is responsible for all material covered or assigned during that class. **Attendance during laboratory experiments and for class tests is however compulsory.** In the rare event that a student for valid reason (*e.g.* due to an intensive course, illness, *etc.*) is or anticipates to be absent during a laboratory experiment or for a class test, the student **must**, where possible, inform the teacher and provide the necessary documents before the absence or, at the latest, on the day of their return. If the absence is excused, students will have the opportunity to complete the assessment.

All other assessments (readings, quizzes, lab activities, *etc.*) missed due to absence are:

- assigned a grade of zero where the absence is not excused;
- given zero weight in the calculation of the final grade where the absence is excused.

For additional information regarding attendance, students should refer to the Institutional Student Evaluation Policy (ISEP section III-C).

Literacy standards

It is expected that students will be able to comprehend the course material and express themselves appropriately as a normal part of their academic performance in the course. Marks may be deducted for inadequate communication skills.

Laboratory work

Experimentation is an essential part of science. Students will be expected to perform experiments and report on their results. Your teacher will provide you with instructions for lab experiments and activities (there is no manual to purchase). **Students must be present during the entire lab activity to receive credit.**

Student conduct

Everyone has the right to a safe and non-violent environment. Students are obliged to conduct themselves as stated in the Student Code of Conduct and in the ISEP section on the roles and responsibilities of students (ISEP section II-D). Disruptions or excessive noise will not be tolerated. Students who do not comply with these rules will be asked to leave the class and may be referred to Student's Services for disciplinary action. **Mutual respect is the key to a harmonious learning environment.**

Academic integrity

Cheating, copying, or any other form of academic dishonesty will not be tolerated. Students should acquaint themselves with the policy of the College on plagiarism and cheating. According to ISEP, the teacher is required to report to the Sector Dean all cases of cheating and plagiarism affecting a student's grade (ISEP section IV-C). The usual penalty for the first instance of cheating will be a grade of zero for the piece of work in question to all parties involved (under certain circumstances, even a first offence may be penalized by failure in the course). A second offence may result in the failure of the course. Students should note that using someone else's laboratory data without authorization from the student and the teacher is cheating.

Intensive course conflicts

If a student is attending an intensive course, the student must inform the teacher, within the first two weeks of class, of the specific dates of any anticipated absences.

Policy on religious observance

Students who intend to observe religious holidays must inform their teachers in writing as prescribed in the ISEP Policy on Religious Observance (ISEP Section III-D), within the first two weeks of the semester. Forms for this purpose are available from your teacher. Your teacher will inform you of any modifications to planned course activities resulting from the teacher's own religious commitments.

Course content

Movies and television shows sometimes take great liberties when it comes to the laws of physics or in portraying science, but they also get it right sometimes. When are they right and when are they wrong?

Are they sometimes only partly right and partly wrong? This course will explore science and physics through movies and television shows. Both the qualitative and quantitative aspects of science and physics will be explored however, students are only expected to use basic math and simple calculations (advanced math is *not* required).

Most of the course material will be presented in themes with each lasting about two weeks and involving a specific topic. There will be approximately 5 or 6 themes explored in this course. Possible theme topics include: Energy, momentum and conservation; gravity, forces and motion; the stars and the universe (cosmology); modern physics; size and scaling. Your teacher will discuss the themes to be covered during the first full week of classes.

While there is no laboratory component in this course, experimental verification of physical reality is a key aspect of science and as such some class activities will occasionally involve experimental demonstrations and the analysis of data collected in the class or acquired from film clips. No lab reports will be required for this course.

Questions outside class

- All regular day program teachers will be available in their respective offices to their students during posted office hours. In the first week, your teacher will inform you of their schedule and will post it outside their office.
- Room 7A.1 is the physics study room. At scheduled times, a teacher or peer tutor will be on duty there to answer your questions. The schedule of teachers and peer tutors will be posted outside of 7A.1 in the 2nd or 3rd week of term.