PHYSICS
Science
Mechanics
203-NYA-05 (all sections)
Fall 2017

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Pre-requisites	Sec. V Physics 504, Mathematics 506 (or equivalent)
Co-requisites	Calculus I (201-NYA-05)
Ponderation	3-2-3 (3 hours of lecture, 2 hours of labs, and 3 hours of work outside class per week)
Course objectives	The role of this course in the program is two-fold. First, it presents the basic principles of mechanics { kinematics, dynamics, and the three conservation laws (energy, momentum and angular momentum) { which are essential to the study of all the natural sciences. Second, it provides an opportunity for students to develop problem solving skills. The laws and concepts introduced in this course are the foundation of our scienti c view of the world.

Course competencies

This course will allow the student to fully achieve the competency:
OOUR: To analyze di erent physical situations and phenomena in terms of the fundamental principles of classical mechanics.

1. To describe the translational and rotational motion of objects.
2. To apply the concepts and laws of dynamics to the analysis of the motion of objects.
3. To carry out calculations of work, power and energy in simple situations.
4. To apply the conservation principles of mechanics.
5. To verify experimentally some of the laws and principles of mechanics.

This course also contributes to the partial achievement the competency:
OOUU: To apply what the students have learned to one or more subjects in the sciences.

1. To identify the scienti c aspects of a given topic from an interdisciplinary perspective
2. To transfer what they have learned to situations requiring the contribution of more than one discipline
3. To apply systematically an experimental method
4. To solve problems
5. To use data processing technologies
6. To reason with rigor
7. To communicate clearly and precisely
8. To show evidence of independent learning in the choice of documentation or laboratory instruments
9. To work as members of a team
10. To make connections between science, technology and the evolution of society
11. To identify the underlying values underlying their treatment of a topic
12. To place scienti c concepts used in a historical context
13. To show attitudes appropriate for scienti c work
14. To apply acquired knowledge and skills to new situations

Evaluation

The Institutional Student Evaluation Policy (ISEP) is designed to promote equitable and e ective 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.

There are two grading schemes. Your nal grade will be the higher of the two schemes.

Assignments, quizzes and class tests[y]	40%	25%
Laboratory activities	20%	20%
Final examination	40%	55%

[y] Your teacher will provide a detailed breakdown of these components and a tentative test schedule during the rst week of class.

In order to pass the course, students must show a basic understanding of the course material at the level covered in the lectures and in the lab. This is achieved by attaining a nal grade of at least 60%, calculated according to the evaluation scheme above. Note: course work not submitted by the due date may be penalized at the teacher's discretion.

Reference materials

1. Physics for Scientists and Engineers (with Enhanced WebAssign) by Serway & Jewett, 9th edition or Physics for Scientists and Engineers (with Mastering Physics) by Knight, 4th edition. Custom packages for Dawson College NYA are available at the bookstore which include an access code for the online homework system. Your teacher will tell you which textbook will be used in your section.
2. Library copies: Copies of the textbook are available on reserve in the Dawson Library.

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 e ort 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

Course content

The material to be covered is contained in the following chapters and sections of Physics for Scientists and Engineers by Knight, 4th edition.

Weeks	Topics	Chapter & Section
1	Concepts of motion	Ch.1: 1{8
2{3	Kinematics in one dimension	Ch.2: 1{6 (7 optional)
4{5	Kinematics in two or three dimensions (including circular motion)	Ch.3: 1{4; Ch.4: 1{6
6{7	Dynamics in one dimension	Ch.5: 1{7; Ch.6: 1{4, 6 (5 optional)
8-9	Newton's laws	Ch.7: 1{5
10	Dynamics in two dimensions	Ch.8: 1{5
11		