



PHYSICS
Physiotherapy Technology
Physics for Physiotherapy Technology
203-946-DW (all sections)
Fall 2019

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Pre-requisites Secondary IV Mathematics 563-404, Secondary V Physics 553-504

Co-requisites None

Ponderation 2-3-3 (2 hours of lecture, 3 hours of labs, and 3 hours of work outside class per week)

Course objectives This course will cover some of the basic concepts of biomechanics. Students will learn the laws governing motion, forces and their interactions, work, energy and rotation. These notions will be applied to problems involving equilibrium, movement, and the limits of the human body. Fundamental concepts of waves and electricity will also be covered as an introduction to therapeutic electrotherapy techniques.

Detailed information regarding the objectives and standards for the competencies related to this course and the specific performance criteria is available at <https://www.dawsoncollege.qc.ca/oad/professional-development/ministerial-program-documents/>.

Course competencies This course will allow the student to partially achieve the following two competencies by covering all the fundamental physical notions required to attain a proper understanding of principles relating to human biomechanics and electrotherapy.

OO2Z: To analyze the position and movements of the human body.

1. Analyze the mechanical forces and constraints placed on anatomical structures in a static position and during movements.
2. Analyze how joint and muscle structures help maintain positions and perform movements.
3. Analyze position of joint and muscle structures in static and dynamic situations.

OO3H: Provide electrotherapy treatments.

1. Create a favorable environment for the intervention.
2. Explain how electrotherapy apparatuses are used.

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Reference materials

1. Reference texts covering statics and materials can be found at:
<http://www2.dawsoncollege.qc.ca/croderick/PPT/>
2. Reference texts covering energy, waves and electricity will be taken from the OpenStax College Physics textbook available at:
<https://openstax.org/details/college-physics>

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 IV-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

**Course
content**

The material to be covered is contained in the following chapters of the text.

Weeks	Topics	
0{1	Units, Vectors, and math review	
1{3	Forces, static equilibrium, applications to physical rehab	
4{7	Torque, equilibrium, more advanced applications	
8	Physics of solids and biological materials	
9{10	Energy and Power	
11{12	Waves and Sound: Properties of waves, propagation, superposition, resonance, ultrasound therapy, <i>etc.</i>	
13{14	Electricity: Current, voltage, circuits, safety, AC/DC, electrotherapy	
15	Review	

Note: The above schedule is tentative.