

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

Teacher	Chris Roderick 7A.10, local 4008, croderick@dawsoncollege.qc.ca						
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	<p>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.</p> <p>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/.</p>						
Course competencies	<p>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.</p> <p>OO2Z: To analyze the position and movements of the human body.</p> <ol style="list-style-type: none">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. <p>OO3H: Provide electrotherapy treatments.</p> <ol style="list-style-type: none">1. Create a favorable environment for the intervention.2. Explain how electrotherapy apparatuses are used.3. Use low-, medium-, and high-frequency current for antalgic, trophic and tissue repair purposes.4. Use ultrasound for antalgic, trophic and tissue repair purposes.5. Use radiation for antalgic, trophic and tissue repair purposes.6. Use electrical stimulation and biofeedback for motor rehabilitation purposes.7. Use direct current for iontophoretic purposes.						
Evaluation	<p>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.</p> <table><tr><td>Laboratory activities</td><td>30%</td></tr><tr><td>Class tests and quizzes[†]</td><td>40%</td></tr><tr><td>Final examination</td><td>30%</td></tr></table> <p>[†]Your teacher will provide a detailed breakdown of these components and a tentative test schedule during the first week of class.</p> <p>If the student receives a grade less than 60% in either portion of the course (theory or lab), the maximum course grade they will be granted is 55%.</p> <p>Note: course work not submitted by the due date may be penalized at the teacher's discretion.</p>	Laboratory activities	30%	Class tests and quizzes [†]	40%	Final examination	30%
Laboratory activities	30%						
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Final examination	30%						

Reference materials	<ol style="list-style-type: none"> 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	<p>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 (<i>e.g.</i> due to an intensive course, illness, <i>etc.</i>) 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.</p> <p>All other assessments (readings, quizzes, lab activities, <i>etc.</i>) missed due to absence are:</p> <ul style="list-style-type: none"> • 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. <p>For additional information regarding attendance, students should refer to the Institutional Student Evaluation Policy (ISEP section IV-C).</p>
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 V-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 observing religious holidays must inform their teachers, in writing, as prescribed in the ISEP Policy on Religious Observances, no later than the end of the second week of the impacted semester or term. This applies both to the semester or term, as well as to any final examination period. (ISEP Section IV-D) Please refer to the academic calendar for the exact dates. 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**

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.