Thursday	**10:00 am - 11:00 am**
Thursday	**1:00 pm - 2:00 pm**

Course Description, Learning Goals and Objectives

In this first course for most of the Specialist and Major Programs in Physical Sciences, we will provide an introduction to the concepts, approaches, and tools the physicist uses to describe the physical world, while laying the foundation for classical and modern mechanics. Topics will include: the mathematics of physics, energy and work, momentum and conservation laws, kinematics and dynamics, Newtonian gravity, rigid-body motion, oscillatory motion, and wave phenomena.

By the end of the course you will be able to:

- **Identify and define the vocabulary used in Physics to describe types of motion and their causes.**
- **Use techniques for analytical and numerical problem solving that go beyond "plug-in-the-formula".**
- **Interpret and give examples of the laws of Nature governing the field of Newtonian mechanics.**
- **Using mathematics as the basic scientific language, employ techniques of single-variable calculus to model, simplify, and solve physical problems.**
- **Recognize and apply the fundamental laws describing wave and oscillatory phenomena.**
- **Employ problem-solving skills to the analysis of physical systems, in the form of conceptual and phenomenological questions, and multi-concept detailed problems.**
- **Identify the main ideas and core physical principles studied throughout the course, and demonstrate their knowledge through deliberate time management and reflective judgement of the questions and problems in practical worksheets, tests, and the final exam.**
- **Self-assess the level of confidence in the acquired knowledge of the core concepts and ideas presented in the course through the decision-making process associated with the allocation of resources during tests and the final exam.**
- **Recognize the existence of a basic model for the study of Physics, and translate this model into tools and learning skills useful in other disciplines.**

Course Corequisite: Calculus I (MATA30 or MATA31)
Course Pre-requisites: Advanced Functions (MHF4U), Calculus & Vectors (MCV4U), Physics (SPH4U)

- **Calculator: A scientific, non-programmable, and non-graphing calculator is required.**

- **Textbook: Fundamentals of Physics by Halliday, Resnick, & Walker (Wiley, 11th Ed.)**

The schedule provided at the end of this document indicates the readings you must complete before watching each lecture video. The reading quizzes will be based on these assigned readings. Your first time reading the assigned material does not need to be highly detailed. Focus on the main concepts, read one or two examples, browse briefly the derivations, and study the review & summary at the end of the chapter. This first reading will be the assumed starting point for all lecture videos. Therefore, failing to complete the readings and associated reading quizzes will impair your ability to understand our lecture discussions.

The textbook also provides the conceptual questions and detailed problems that will be the subject of the weekly online homework, practical activities, and group quizzes. To complete the online homework you will need a registration code for WileyPLUS, available at the UofT Bookstore, either as an access card bundled with the textbook or as a digital-only resource. Once you have a registration code, follow any WileyPLUS link on the course website to complete your registration.

- **Technical Requirements for Remote and Online Learning:**

Please review the minimum and recommended technical requirements for learning in the remote and

Online Homework (5%)

Deployed through the WileyPLUS system, these assignments will be a weekly set of questions based on the textbook reading material and lecture discussions of the week just ending. Each homework is worth 10 points, and your final grade is the average of the best 10 results. A mix of conceptual questions and applied problem-solving exercises will be included. Do not spend more than two hours on each homework.

Practical Worksheets (10%)

Prior to each practical session you will have the opportunity to review a worksheet based on conceptual questions and detailed problems from the material of the week just ending. During the online synchronous practical session on Zoom you will have the opportunity to discuss the activities in the worksheet with your peers under the expert guidance of a practical leader. Additionally, during the practical session

In order to submit work for the detailed problems in Test # 2 and the Final Examination you will be required to digitize completed work either through the use of a scanner or by converting photos taken with a mobile device into acceptable PDF files. We strongly recommend installing and exploring the use of a document scanner app when converting photos taken with a mobile device.

The only aids allowed for Test # 1, Test # 2, and the Final Examination are your non-programmable scientific calculator, and a hand-written, double-sided, and letter-sized aid sheet. Photocopies or computer printouts are not allowed.

Class Notes

Academic Integrity and Respect for the Academic Endeavor

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters:

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The lectures of this course will be recorded on video and will be available to students in the course for remote viewing. Course videos and all additional course materials, including all assignments and various assessment instruments, belong to your instructor, the University, and/or other sources depending on the specific facts of each situation, and are protected by copyright. Do not download, copy, or share any course materials or videos without the explicit permission of the instructor.

Absences