Instructor
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Office Location
NFSC, 1009

Student Hours
Monday: 11:30 am -12:20 pm
Tuesday: 10:30 – 11:20 am
Wednesday: 10:30 – 11:20 am

Class Time and Location
Monday: 1:30 - 2:20 pm
Wednesday: 12:30 – 1:20 pm
Friday: 11:30 – 12:20 pm

Location: **MULH 2070**

ST. FRANCIS XAVIER UNIVERSITY

Subject Name: Phys 121, Fall 2024
Physics for the Physical Sciences and Engineering I

Course Overview
Physics 121 is an introductory course dealing with classical mechanics, i.e., Newton's laws, momentum and energy, and rigid body dynamics. The concepts that you will learn in this course will lay the foundation for many advanced topics in physics and engineering, such as quantum mechanics, relativity, statics, and stability analysis. PHYS 121 is a calculus-based course, which means that we will use the concepts of derivatives and integration. We will cover chapters 1-13 of the text. Certain sections may be omitted; this will be noted in the course syllabus.

Additional Course Information
Class participation, textbook consultation, doing assignments, and participating in-class quizzes are the key to success in this course. Class attendance is strongly recommended, and students are responsible for collecting information from the classes.

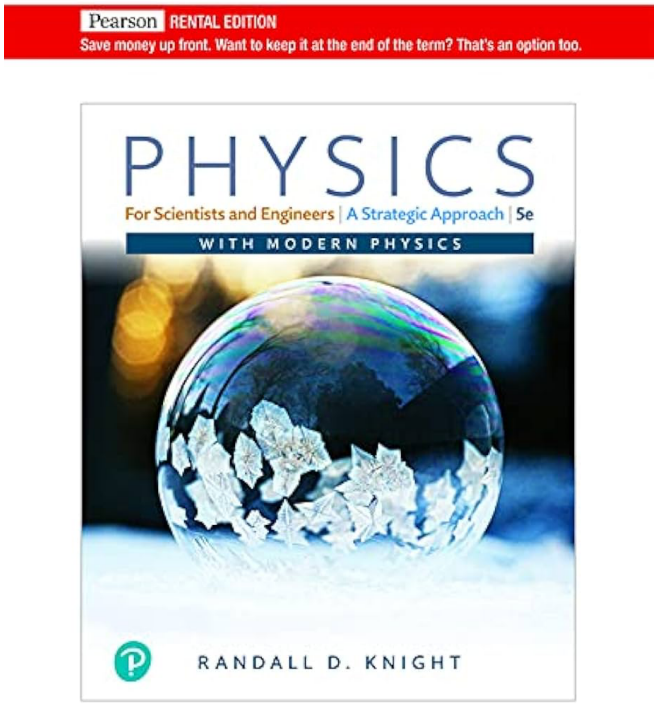
Learning Objectives
By the end of this course, students will be able to:

- Describe and analyze the motion of an object in terms of position, velocity, and acceleration.
- Describe and analyze the motion of an object in linear, circular, projectile, and rotational situations.
- Demonstrate how the kinematics are different than dynamics.
- Visualize a critical situation and solve the problem accordingly.

Required text

To work on recommended problems, and as an additional resource to the lecture notes, you will need access to the textbook.

Knight: Physics for Scientists and Engineers, 5th Edition
online Edition with Mastering Physics access, ISBN 9780137319497



You have several options to obtain this text.

1. The Campus Store (https://shop.stfx.ca/Course/campus/) offers an option, "**PHYS 121-10 Fall 2024 WITH e-text",** which includes the online version of the textbook ("e-text") and access to Mastering Physics (an online assignment system, see below) for a lower price. You will have access for 24 months (check with the store!), and you can use e-text and Mastering Physics for PHYS 121 and PHYS 122.
2. You can buy a used hard copy of the 5th edition textbook. Then, you may purchase access to MasteringPhysics (without e-text) separately from the Campus Store.
3. You can also buy access to MasteringPhysics and the e-text directly from MasteringPhysics.com, but that is either considerably more expensive (all prices there are in US dollars), and you may only have access for 18 weeks, which is insufficient unless you do not plan to take PHYS 122.

Evaluations

Category	Weight
Laboratory	18%
Assignments (MasteringPhysics)	15%
Online quizzes (classroom and tutorials)	10%
Midterm (October 09, 2024)	18%
Final	39%
Total	100%

Labs

Labs and Tutorials will alternate weekly and will start on Monday, September 09 or Tuesday, September 10, depending on the lab section you are registered in on MesAMIS. All information about the lab is available at the PHYS 121 lab Moodle page. In particular, you will find information about whether you will be in the lab on September 09/10 or in the tutorial.

Lab Grading Policy:

- If you fail to provide complete lab notebook work for any one experiment, your lab grade will be reduced by 20 percentage points.
- If you fail to provide complete lab notebook work for any two experiments, you will receive a zero for the lab portion of the course, regardless of your performance on other experiments, or lab exam.
- If you fail to provide complete lab notebook work for any three or more experiments, you will receive a zero for the lab grade, and your mark *for the entire course* will not be more than 49/100, regardless of your performance on assignments, midterms and exams.
- The lab notebook work for experiments must be completed and assessed within one week of the scheduled day for the relevant experiment, after which time the lab notebook work for the experiment(s) will be assessed as incomplete.

Tutorials

Tutorials start at 2:30 pm and end at 5:00 pm and will be conducted in person in PS 3046. Tutorials are *the* opportunity to work on recommended problems or assignments in a setting where you can get immediate one-on-one help from me. Furthermore, depending on the interest of the students, an in-depth discussion of special topics of the course may be offered. Each tutorial will focus on course problems and conceptual problems. I will discuss general concepts and provide one-on-one assistance if you get stuck, and to try to help you overcome any difficulties that arise. The tutorials are the best way to get individual help with any problems you are having in the course. **Attendance in mandatory**. We will have a portion of in-class quizzes in tutorials.

Mastering Physics assignments

There will be several assignments throughout the term. The assignments will be delivered and graded online at Masteringphysics. Be sure to login regularly to MasteringPhysics to keep track of the current assignments and due dates. You need to obtain an access code and register during the first week of classes using the **course ID ahmed93693**. The textbook you should choose during the registration process is *Knight, Physics for Scientists and Engineers 5th edition.* You can obtain an access code for MasteringPhysics with or without the textbook as described above. A complete course registration procedure on Pearson is available in the linked page.

An assignment (for credit) that will introduce you to the MasteringPhysics system will be due within the first week of classes. All other assignments will consist of a number of questions for credit and sometimes others for practice. Questions for credit will contribute to your total assignment mark according to the indicated weight.

Generally, you are free, even encouraged, to discuss the assignment problems with your classmates, a student assistant, or me. However, after these discussions, *make sure that you work on the solution by yourself. This is the single most important thing you can do to succeed in Physics 121!* Physics can only be learned by actually working on problems and experiments – just memorizing what has been said in the lectures won′t help much. Solve as many problems as possible by yourself. Problems very similar to the assignments will appear on quizzes, midterm and final exam, when you won′t be able to rely on the help of others.

Classroom questions

Classroom response systems enable students to answer questions during classes. Educational research has shown that response systems have a very positive effect on learning. We will use Learning Catalytics, which is included in the textbook package. You can login with your MasteringPhysics user name and password. No separate registration is required, but you will need a smart phone, tablet or laptop to access the Learning Catalytics web page during class. I recommend to save the link on the device that you will be using.

Each question during the lectures will earn you up to two points: one point for submitting an answer and an additional point if the answer is correct. We will start collecting classroom responses during the second week of the term.

X-ACT

X-ACT is a 6-week, peer-led transition program for incoming students. Students attend weekly workshops developed by the Student Success Centre and the Health and Counselling Centre. The program uses a peer-tutoring model, and this year the workshops will be delivered primarily by second-year BEd students who completed their undergraduate degrees at StFX. The workshops will cover topics such as time management, using a syllabus, using Moodle, academic integrity, academic regulations, developing a growth mindset, and accessing resources.

Incoming students are encouraged to sign up for X-ACT – StFX Academic Transition program. Students who successfully complete the program by attending 5 of the 6 workshops will be able to apply bonus marks to one of their courses that is participating in X-ACT. (Upper-year students enrolled in this course who would like to participate in the program are invited to email sscentre@stfx.ca to sign up).

This course is collaborated with the Student Success Centre and the Health and Counselling Centre to conduct X-ACT program. If you successfully complete the program, you will be eligible for 1% bonus grade incentive which will be added in the Midterm or Final term score.

More details on X-ACT registration are available in the link X-ACT

Exams

- Quizzes: In class (Learning Catalytics)
- Midterm: October 09, 2024 (Wednesday) [Time: 12:30 pm – 1:20 pm]
- Lab exam: Follow the lab page
- Final: The university registrar's office will set the final exam date.

Policies

Academic Accommodation: If you have missed, or know you are going to miss, any graded component of the course due to medical or extenuating circumstances, please contact me **in writing by email** as soon as possible to explain the situation. Reasonable accommodation will be provided when warranted. You will not be required to provide a doctor's note. Normally, when you miss a component of the course for valid reasons, the weight of the missed component will be moved to other components in the same category (e.g. assignments), or to the final exam, at the discretion of the instructor. Any graded component of the course that is missed or is submitted after the deadline without my receiving a satisfactory written explanation will receive a zero grade.

Midterms missed without a valid excuse will receive a grade of zero. If a midterm is missed for a valid reason, its weight will be transferred to the final exam. There are no makeup midterms.

Missed final exam (December): If you are unable to write the final exam due to illness or due to a serious, unexpected circumstance, you must notify the Office of the Dean of Science within 48 hours of the scheduled exam time.

Class Attendance: Any student who is repeatedly delinquent in submitting graded work or misses three or more classes and/or tutorials and/or laboratory sessions without explanation will be reported to the Dean.

Copyright and Intellectual Property: All course materials are designed for use in this course only at StFX University and are the property of the instructor, unless otherwise stated by the instructor. Copying this material for distribution, online posting, or selling of this material to third parties without permission is subject to Canadian Copyright Law and is strictly prohibited. Please visit the StFX

copyright guide for more information.

University Policy on Academic Integrity: St. Francis Xavier values academic integrity. Therefore, all students must understand the meaning and consequences of such academic offences as plagiarism, cheating, tampering, and falsification under Section 3.8 of the academic calendar. The complete university policies on academic integrity are available at https://www.mystfx.ca/registrars-office/academic-integrity

Statement on Equitable Learning: Everyone learns more effectively in a respectful, safe and equitable learning environment, free from discrimination and harassment. I invite you to work with me to create a classroom space – both real and virtual – that fosters and promotes values of human dignity, equity, non-discrimination and respect for diversity.

Physics 121 Course Syllabus

St. Francis Xavier University, Fall 2024

Problems that are printed in bold face italics are ***highly*** recommended. They may serve as a template or inspiration for examination problems.

Week	Text Sections	Recommended Problems
1+2 (Sep 4-13)	Chapter 1+2	**Chapter 2**: **Conceptual Questions**: **5, 7**, 11,13 **Exercises & Problems**: **7, 15, 27, 41, 53**, 5, 9, 17, 21, 23, 25, 29, 31, 33, 35, 37, 39, 47, 49, 51, 55, 63, 73 **Challenge Questions**: 81
3 (Sep 16-20)	Chapter 3	**Chapter 3**: **Conceptual Questions**: **9**, 3, 7 **Exercises & Problems**: **15, 19, 23, 25, 45** , 3, 5, 11, 13, 17, 21, 27, 29, 31, 41
4 (Sep 23-27)	Chapter 4	**Chapter 4**: **Conceptual Questions**: **1, 15**, 5, 7, 13 **Exercises & Problems**: **7, 9, 11, 33, 53, 71**, 3, 5, 15, 23, 25, 29, 35, 37, 39, 41, 43, 45, 47, 51, 55, 57, 59, 63, 65, 69, 73, 75
5 (Oct 1-7)	Chapter 5	**Chapter 5**: **Conceptual Questions**: **13**, 1, 3, 11, 15 **Exercises & Problems**: **13, 19**, 15, 17, 33
6 (Oct 21-25)	Chapter 6	**Chapter 6**: **Conceptual Questions**: **13**, 3, 5, 15 **Exercises & Problems**: **3, 9, 31, 55, 57**, 1, 5, 7, 11, 13, 15, 19, 25, 27, 29, 41, 47, 49, 51, 53, 61

7 (Oct 17-21)	Chapter 7	**Chapter 7**: **Conceptual Questions**: **13**, 7, 11 **Exercises & Problems**: **9, 13, 17, 23, 33** , 7, 29, 39, 45, 49
7 (Oct 28-Nov 1)	Chapter 8	**Chapter 8**: **Conceptual Questions**: **5**, 3, 9 **Exercises & Problems**: **11, 21, 27, 37, 51**, 7, 17, 25, 41, 45, 47, 49, 55, 57, 61, 63
8 (Nov 4-8)	Chapter 9	**Chapter 9**: **Conceptual Questions**: **3, 9**, 5 **Exercises & Problems**: **11, 21, 29, 33, 43**, 5, 7, 9, 13, 15, 17, 19, 25, 45, 59
9 (Nov 13-18)	Chapter 10	**Chapter 10**: **Conceptual Questions**: **13**, 5 **Exercises & Problems**: **11, 19, 25, 45, 51**, 5, 7, 9, 13, 21, 27, 29, 31, 33, 53
10 (Nov 20-25)	Chapter 11	**Chapter 11**: **Conceptual Questions**: **3, 11**, 1, 5 **Exercises & Problems**: **15, 31, 39, 41, 53**, 3, 5, 9, 13, 19, 23, 27, 29, 33, 43, 49, 55, 59, 73
11 (Nov 27-Dec 2)	Chapter 12	**Chapter 12**: **Conceptual Questions**: **7, 9, 11**, 1, 3, 13 **Exercises & Problems**: **27, 41, 63, 69, 73, 81**, 5, 7, 11, 13, 15, 19, 21, 25, 29, 31, 33, 35, 37, 39, 43, 45, 49, 57, 59, 61, 65, 67, 71, 75, 83
11 (Dec 4-6)	Chapter 13	**Chapter 13**: **Conceptual Questions**: **Exercises & Problems**: