

Physics 121.6 General Physics

Course Outline 2007-2008

Instructor

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Course Objectives

- A calculus based survey course of basic physics principles.
- Study some of the applications of physics to technology and other scientific fields.
- To give a solid grounding in basic physics that will serve as a basis for further study in physics or other scientific fields.
- Develop analytical and mathematical skills that will be applicable to many scientific endeavours.
- Demonstrate the application of the scientific method through laboratory experiments.
- Develop an appreciation for how scientific measurements are made.

Syllabus

The general topics to be covered are:

- Mechanics
- Fluid Mechanics
- Oscillations and Waves
- Electricity and Magnetism
- Light and Optics

See the Lecture Schedule for a more detailed list of topics.

Required Materials

1. **Physics for Scientists and Engineers**, by Serway and Jewett, 7th Edition, (Thomson, Brooks/Cole)
2. **Laboratory Manual for Physics 121.6**, Revised 2003
3. **TurningPoint RF Response Card (Clicker)** from [Turning Technologies](#), Available from the Campus Computer Store.

Note: Some classes require a specific brand of calculator. In this class **any scientific calculator** may be used.

Supplementary Materials

1. **Student Solutions Manual and Study Guide for Physics for Scientists and Engineers**, by Gordon, McGrew, and Serway.
2. **Multiple Choice Questions for Physics 111.6**

Prerequisites

Physics 30, and MATH 110.3, and either MATH 116.3 or MATH 112.3. The MATH prerequisites may be taken concurrently with Physics 121.6.

Internet Access is Required

The class web page, <http://physics.usask.ca/~pywell/p121>, will be used throughout the course for posting announcements, assignment questions and solutions, test solutions, assignment and test marks, and many other supplementary materials. In addition the Reading Quizzes will be handled exclusively through the web site.

Grading

	Final Grade	Mid-Term Grade
Assignments	7%	7%
Reading Quizzes	3%	3%
Classroom Participation	2%	2%
Mid-Term Test #1	7%	34%
Mid-Term Test #2	7%	34%
Mid-Term Test #3	7%	
Mid-Term Test #4	7%	
Laboratories	20%	20%
Final Examination	40%	
TOTAL	100%	100%

Note: The laboratories are an integral part of this course. Completion of **all** the laboratory experiments is mandatory to receive a passing grade in the course. If you do not complete all the labs your grade calculated without the laboratory component, or 49%, whichever is less, will be your final grade.

Note: Attendance at the final examination is mandatory for receiving a passing grade. If you do not write the final examination your grade calculated without the final examination component, or 49%, whichever is less, will be your final grade. If you miss the final examination you may, depending on the circumstances, be able to apply for a Deferred or Special Deferred examination.

Mid-Term Tests and Final Examination

Mid-Term Tests are normally about 90 minutes long and are on the lecture material that was covered from the previous test (or from the beginning of the year) to about a week before date of the test. The Final Examination is 3 hours long and covers the whole year's work. The Mid-Term Tests must be scheduled outside the lecture time.

The Tests are scheduled:

Mid-Term Test #1	Wednesday October 24, 2007 at 7:00 pm
Mid-Term Test #2	Tuesday November 27, 2007 at 7:00 pm
Mid-Term Test #3	Thursday January 31, 2008 at 7:00 pm
Mid-Term Test #4	Wednesday March 12, 2008 at 7:00 pm
Final Examination	April, 2008 (TBA)

Information on exam rooms, details of the exam format, and the material that will be covered on each test, will be announced prior to each test. Some students will have a timetable conflict with one or more of the tests. As the date for each test draws near, arrangements will be made for those students to write the test at an alternative time.

Academic Honesty

Cheating in any form, including plagiarism (copying), is treated as a serious offence by the University. You should familiarize yourself with the material contained on the University website <http://www.usask.ca/honesty>.

Tutorials

- Wednesdays, 1:30 pm – 2:20 pm, Room 103 Physics Building

Tutorials will be held regularly throughout the year, but not necessarily every week. The purpose of the tutorials is to

- provide more worked examples than are possible in the lectures.
- instruct you on the best techniques to approach complex problems.
- provide additional material that will help you prepare for the Tests and Final Examination.

Office Hours

- Monday, 1:15 – 2:30; Tuesday, 1:15 – 2:30 in Room 251 Physics Building.

You are welcome to come and see me about any aspect of Physics 121.

- I will endeavour to be in my office and available at the above times during term. There will be times when I am unavoidably called away. I will try to let you know in advance if I am not going to be available at the above times.
- You are welcome to come to see me at other times as well, if I am available.

Lecture Examples

We will do a large number of examples in class. A handout with the text of the example questions we will do in class will be provided. This is so you do not have to spend time in class copying down the question. You can then concentrate on the process of solving the problem.

Help Desk

The **First Year Physics Help Desk** in Physics room 126 is open three afternoons a week

- Tuesday, Wednesday and Thursday from 1:00 pm to 4:30 pm

The Help Desk will be staffed during its open hours by a tutor, who is a graduate student in physics. You may "drop in" at any time for assistance with any question or problem arising from Physics 121. The tutor will be familiar with the course material and with the homework assignments, and should be able to help you.

Students will be seen on a first-come, first-served basis. Students requesting assistance with more than one problem may be asked to wait after the first problem so that other students may be assisted.

Desks are available where students may work after receiving assistance from the tutor.

A few tips to make your visits to the Help Desk productive:

- If you have a question about a concept or about the course material, try to have a specific question in mind.
- If you are requesting help with a specific problem, make an honest attempt to solve the problem before visiting the Help Desk. The tutor will usually begin by asking how you went about your solution: he can then tell you if you have taken the right approach to the problem. If you have your work with you he might also be able to point out any specific mathematical errors.
- If you have no idea how to start a problem, or if you got started but took the wrong approach, the tutor will try to point you in the right direction. Once you get the problem started, the tutor will ask you to try to complete the solution yourself.
- Do not leave it to the last moment. Bear in mind that the Help Desk may get busy just before an assignment is due and prior to a test or exam, so you might have a long wait. Also remember that the Desk could be closed at any time due to unforeseen events such as illness, snowstorms, etc

Mathematics Requirements

In addition to basic calculus, which we will develop as the year progresses, and you will get from the MATH co-requisite classes, there is a large body of general mathematics, including algebra, geometry and trigonometry, with which you should be familiar.

You should review the material in Appendix B “**Mathematical Review**” in your text book, in particular sections B.1 to B.5. If you are not completely comfortable with the mathematics in those sections you should consider doing some review. There is help available. Two possibilities are:

Exercises in Math Readiness

The “Exercises in Math Readiness” EMR web site set up by the Department of Mathematics and Statistics. This site is located at <http://math.usask.ca/emr>
Here you will find review material and questions on all the basic mathematics you will need.

Physics Math Review Course

UNDERSTANDING THE LANGUAGE OF PHYSICS

September 12, 13, 14, 2006

7:00 - 9:00 p.m.

Room TBA

FEE: \$15

This optional 3-evening non-credit Extension course is intended for students who have registered in Physics 111.6, Physics 121.6, Astronomy 101.6, or General Engineering 124.3. The course will *review* the mathematical concepts and techniques that are used in a first-year physics or astronomy course. Topics covered will include linear, quadratic, and simultaneous equations, graphical representation, exponents and logarithms, trigonometric functions and identities, units, scientific notation, significant figures, and vectors (different material will be covered each evening).

For further information you may contact one of the instructors:

Stan Shadick, 966-6434, stanley.shadick@usask.ca

Brian Zulkoskey, 966-6439, zulkoskey@sask.usask.ca

Registration Information: Phone Extension Division at 966-5539

Laboratories

Laboratory work is an integral part of this course. Laboratory marks are included in the calculation of the final grade for the course. Moreover, you must complete **all** laboratory experiments in order to receive a passing grade in Physics 121.6. If any laboratory experiments are missing your final grade for the course will be either 49% or the grade calculated assigning 0% for the laboratory component, whichever is less. Thus, if you miss an experiment due to illness, or any other reason, you must make arrangements to complete the experiment at another time.

The Physics 121.6 laboratory coordinator is **Stan Shadick**.

Room: 132 Physics

Phone: 966 6434

E-mail: Stanley.shadick@usask.ca

Please see him about any questions related to the laboratories.

You must be registered in one of the following laboratory sections:

Lab. Section	Meets
L01	Tuesdays, 2:00 – 4:50 p.m.
L02	Wednesdays, 2:30 – 5:20 p.m.
L03	Thursdays, 2:30 – 5:20 p.m.

If you believe you qualify for a lab exemption you should see Stan Shadick as soon as possible.

Introductory laboratory sessions for Term 1.

During the first week of laboratories there will be special introductory sessions. These will meet:

L01 Tuesday Sept. 12, 2006 at 2:00 p.m. Room 131 Physics

L02 Wednesday Sept. 13, 2006 at 2:30 p.m. Room 175 Physics

L03 Thursday Sept. 14, 2006 at 2:30 p.m. Room 175 Physics

Students should attend the introductory session for the laboratory section in which they are registered, but if you miss your introductory session you may attend one of the others.

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If you cannot attend any introductory session, then contact Stan Shadick, the laboratory coordinator, before Sept. 19.

You should bring a copy of the “**Laboratory Manual for Physics 121.6**”, (Revised 2003) to the introductory session.

You will need to bring a copy of the Physics 121 lab manual, a graph notebook and a geometry set to all labs. Read pages I – XV, XXIV, XXV, 1-2, 150-152 in the lab manual before attending the first lab.

The proposed laboratory schedule for term 1 is listed in the following table.

Term 1 Laboratory Schedule – 2006

WEEK	MONTH	L01 T	L02 W	L03 Th	ROOM	LAB TITLE
0	SEP		6	7		NO LAB
1	SEP	12	13	14	T:131 W:175 Th: 175	INTRODUCTION
2	SEP	19	20	21	131	M1 Simple Measurements
3	SEP	26	27	28	131	M3 Newton's 1st Law
4	OCT	3	4	5	117	M34 Linear Acceleration
5	OCT	10	11	12	117	M14 Circular Motion
6	OCT	17	18	19	112	M35 Projectile Trajectory
7	OCT	24	25	26	125	M38 Friction
8	OCT/NOV	31	1	2	125	M43 Energy Conservation
9	NOV	7	8	9	125	TOUR
10	NOV	14	15	16	131	M61 Angular Acceleration & Torque
11	NOV	21	22	23	125	M36 Inelastic Collision
12	NOV	28	29	30	125	M37 Elastic Collisions
	DEC	5	6	7		NO LAB

Term 2 Laboratory Schedule – 2007

TBA