

PHYSICS 125.3: PHYSICS AND TECHNOLOGY
Term II 2012-2013 Academic Year

COURSE OUTLINE

Instructor: Prof. Alexander Moewes, Ph.D.

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Course Website: <http://physics.usask.ca/~alex/phys125/>

This course will use the above Course Website for distribution of assignments and posting of solutions and grades.

Course Objectives:

This course introduces students to aspects of physics with an emphasis on applications in technology and the physical sciences. This course can be used as the second part of an introduction to physics. Topics include torque and angular momentum, fluid mechanics, oscillations and waves, optics, special relativity, and nuclear physics. The course will emphasize the

- Development of analytical, mathematical and problem-solving skills, and
- practical application of the scientific method through laboratory experimentation.

Prerequisites:

Prerequisite(s): MATH 110, PHYS 115 or GE 124.

Note: Students with credit for PHYS 111 or 121 or 128 may not take this course for credit. Students may only obtain credit for one of PHYS 117 and PHYS 125.

Lectures:

This class will take place MWF from 12:30 – 1:20 p.m. in Physics 103. On Wednesdays, there is a second contact hour, which we will use 1:30 – 2:20 p.m.

Tutorials:

To be announced on class website. There will be one tutorial before the midterm exam and one tutorial before the final exam.

Office Hours:

I will hold office hours from Mondays and Fridays 1:30-3:30 p.m.

Topics to be covered in Phys 125 (Chapters refer to textbook):

Chapter 10: Rotation, Moment of Inertia and Torque

Chapter 11: Angular Momentum

- Chapter 14:** Fluid Mechanics
- Chapter 15:** Oscillatory Motion
- Chapter 16:** Wave Motion
- Chapter 17:** Sound Waves
- Chapter 18:** Superposition and Standing Waves
- Chapter 35:** Principle of Ray Optics
- Chapter 36:** Image Formation
- Chapter 37:** Wave Optics
- Chapter 38:** Diffraction and Polarization
- Chapter 39:** Relativity
- Chapter 44:** Nuclear Structure
- Chapter 45:** Applications of Nuclear Physics

Academic Honesty (see <http://www.usask.ca/honesty/>):

Students are expected to understand and abide by the principles of academic honesty and to realize that there are potentially serious consequences for dishonest behaviour. It is your duty to educate yourself on academic honesty.

Composition of Grade:

Homework assignments	15%
Laboratories	15%
Midterm	20%
<u>Final Examination (Apr 2009)</u>	<u>50%</u>
Total:	100%

Required Calculator:

Students are **required** to use a Texas Instruments TI-30X series calculator or a Hewlett-Packard HP 30S calculator for all Physics 117 exams. No other calculator may be used. Students are strongly encouraged to read the user manual and use the calculator on a regular basis.

Required Textbooks:

- “Physics for Scientists and Engineers with Modern Physics”, 8th Edition, by Serway & Jewett (Brooks/Cole Cengage Learning).
- “A Laboratory Manual for Physics 117.3/125.3” (revised 2008).

Homework Assignments

- Written assignments will be a key part of this class. You cannot learn physics without doing a lot of problems; these written assignments will give you the opportunity to do this!
- **There will be a weekly written assignment.** Solve each problem with a complete written solution, following the methods outlined in the lectures.
- **Late assignments cannot be accepted.**
- Assignments not submitted will receive a mark of zero.

- The assignment solutions will be posted to the course web site and will remain posted for the duration of the course.
- The marks for each assignment will be posted by your instructor.

Exam Rules:

- Turn off cell phones before entering the examination room.
 - Only Texas Instruments TI-30X series or Hewlett-Packard HP-30S calculators may be used.
- No other electronic device is allowed at your desk (e.g. cell phone, pager, PDA, iPod, MP3 player, electronic dictionary...).
- No written material is allowed at your desk other than the test paper, formulae sheet and OpScan sheet.
 - Bring your student card, a pen, two soft-lead (HB) pencils, eraser, and straightedge.

Laboratories & schedule for 2013

Laboratory work is an integral part of the course and must be completed to obtain credit. See the laboratory policy for Physics 125 below. Contact Laverne Sander in Room 112 Physics (email Laverne.Sander@usask.ca) for any questions regarding the Laboratory component of the course.

NOTE: Lab section L01 (Wed 2:30-5:20) is the ONLY open section. Section L02 (Tuesday@ 11:30-2:20) is NOT operating.

Wed, Jan 9: **[NOTE TIME CHANGE]** Lab introduction @ **1:30pm** in **Room 103** Physics (your Tutorial timeslot), **NOT** at the normal 2:30 lab time. Class will be sectioned into "I" and "II" subgroups at this time. NOTE: Anyone who does NOT attend the introduction will not be permitted to do the experiments.

Wed, Jan 16: Group "I" ONLY - Lab M39 in room 117 Physics.

Wed, Jan 23: Group "II" ONLY - Lab M39 in room 117 Physics.

Wed, Jan 30: Group "I" ONLY - Lab M19 in room 117 Physics.

Wed, Feb 6: Group "II" ONLY - Lab M19 in room 117 Physics.

Wed, Feb 13: Group "I" ONLY - Lab L11 in room 117 Physics

Week of Feb 18-22: MIDTERM BREAK

Wed, Feb 27: Group "II" ONLY - Lab L11 in room 117 Physics.

Wed, Mar 6: Group "I" ONLY - Lab MP6 in room 117 Physics.

Wed, Mar 13: Group "II" ONLY - Lab MP6 in room 117 Physics.

Wed, Mar 20: Group "I" ONLY - Lab MP9 in room 112 Physics.

Wed, Mar 27: Group "II" ONLY - Lab MP9 in room 112 Physics.

Physics 125 Laboratory Policy

1. Laboratory work is an integral part of the course. A student will not receive a passing grade for the course unless **all** of the experiments have been completed. Failure to complete the laboratory work will result in failure in the course.
2. Withdrawing from Physics 125 implies withdrawing from the laboratory work in the course as well. You may not continue laboratory work after withdrawing from the course, even if you decide to continue to attend the lectures.
3. If you complete Physics 125 with a final grade of 40% or higher and complete the laboratory work with an average laboratory mark of at least 70%, and you then repeat the course in a later session but within three years, you may request exemption from all of the labs. Your laboratory mark for the year will be the average mark you received for the experiments already performed.
4. If you complete Physics 125 with a final grade of less than 40% or if you withdraw after the March 15 deadline, **no** laboratory exemption will be granted.
5. Laboratory exemptions are not automatic. Students who have completed at least the first term of Phys 111 labs within the last three years **may** qualify for a **partial** lab exemption for Phys 125 on a lab-by-lab basis. To request an exemption from laboratory work, you must contact Laverne Sander in Room 112 Physics (email Laverne.Sander@usask.ca).

Tutorials schedule

Tutorials are available and scheduled at the following times:

Class	topic	Instructor	Time	Room
P117/125	Intro Phys	Zulkoskey	Tue 1:00 - 3:30 pm	126 (Physics)
P117/125	Intro Phys	Zulkoskey	Wed 1:00 - 3:30 pm	126 (Physics)
P117/125	Intro Phys	Zulkoskey	Thu 1:00 - 3:30 pm	126 (Physics)

Helpdesk schedule

A helpdesk is available and scheduled at the following times:

Class	topic	Instructor	Time	Room
P117/125	Intro Phys	Zulkoskey	Mon 2:30 - 4:00 pm	126 (Physics)
P117/125	Intro Phys	Zulkoskey	Tue 11:30 - 1:00 pm	126 (Physics)
P117/125	Intro Phys	Zulkoskey	Mon 11:30 - 1:00 pm	126 (Physics)
P117/125	Intro Phys	Zulkoskey	Wed 11:30 - 1:00 pm	126 (Physics)
P117/125	Intro Phys	Zulkoskey	Thu 2:30 - 4:00 pm	126 (Physics)
P117/125	Intro Phys	Zulkoskey	Fri 3:30 - 4:00 pm	126 (Physics)