

*The University of Western Ontario
Department of Physics and Astronomy*

**Physics 247F
Fundamentals of Modern Physics I
Fall 2001**

Description

This course provides an introduction to basic ideas developed in 20th century physics. We focus more on concepts than on experimental methods and detailed applications.

Lectures: 232 Physics and Astronomy Building (PAB), T Th 11am-12pm

Course Topics

Special relativity: time, length, mass, and energy. General relativity. Particle properties of waves: photons. Wave properties of particles: De Broglie waves. Quantum Mechanics, Schrodinger's equation. Atoms: energy spectra, electron spin, the laser. Molecules: bonds, rotational and vibrational energy levels.

Instructor

Shantanu Basu
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Contact information

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P247 web page: www.astro.uwo.ca/~basu/teach/phy247/index.html
Office hours: Due to the small size of this class, meetings can be arranged by appointment.

Prerequisites

In order to take this course, you must have taken:

1. A course in first-year physics, either Physics 020, 024, 025, or 026.
2. Calculus 050a/b plus one of 051a/b or 081a/b, or Applied Math 026, or Math 030.

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you will be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

Textbook and Other Materials

Concepts of Modern Physics, 5th edition, Beiser, A. 1995, Harcourt Brace, ISBN 0-07-004814-2.

This book is available in the Heavy Demand section of the Taylor Library in the Natural Sciences Centre. It may be borrowed for limited periods of time for use in the library. The Student Solutions Manual for odd numbered problems is also available in the bookstore.

Please note that you will need a calculator for problem sets and the final examination.

Assignments/Exams/Grading

Homework problems will be assigned periodically, usually every two weeks. A project, consisting of a written report will also be required. The report will cover a topic in modern physics that you have chosen in consultation with me. The three-hour final exam will occur during the university scheduled examination period in December.

Your final grade will be determined as follows:

Assignments	40%
Project	25%
Final exam	35%

You are considered responsible for all material presented in the lectures, whether it is in the textbook or not. Lecture material will appear in assignments and the final exam. Please be sure to read the relevant material in the textbook as we cover them during the term.

Note that regular work on the assignments and written project will earn you most (65%) of your grade. Doing the assigned problems is also the best way to keep up with the lectures and prepare for the final exam.

Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence (see Scholastic Offence Policy in the Western Academic Calendar). The University of Western Ontario uses software for plagiarism checking. Students may be required to submit their written work in electronic form for plagiarism checking.