PHYS-UA 9012 - L01
General Physics II

NYU LONDON 2020

Instructor Information

- Dr Stan Zochowski — Dr Katherine S Whitehead

- Office hours: any time, but check first:
  UCL, Physics, E8

Course Information

- Lectures: Tuesdays and Thursdays, 16:30 – 17:45, (Rm 104);
- Recitation: Monday, 4:30 and 5:30 (Rm G01)
- Labs: as scheduled.
- Prerequisites: MATH-UA 121 Calculus I; *General Physics I*, or equivalent

Course Overview and Goals

This course continues a two-semester introduction to physics (lecture and recitation) intended primarily for pre-professional students and for those majoring in a science other than physics.

Class time is comprised of 2 ½ hours per week of lectures, plus a 1-hour recitation and a 2-hour Laboratory session each week.

Upon Completion of this Course, students will be able to:

Students will learn about: Waves and interference/diffraction. Geometric optics. Conduction in metals. Electric fields. Capacitors. Current and potential. Conductivity and resistivity. Electric potential energy. Circuits. Magnetic fields and induction. Electromagnetism.

Course Requirements

Grading of Assignments

The grade for this course will be determined according to these assessment components:

Assignments/ Activities	Description of Assignment	% of Final Grade
Problem Sets	Based on ten submitted sets	20%
Laboratory Evaluations		30%
Mid-term Exams	Based on best two of three tests	25%
Final Exam		25%

Failure to submit or fulfill any required course component at passable standard (40%)results in failure of the class

Grades

Letter grades for the entire course will be assigned as follows:

Letter Grade	Percent	Description
A	93.5% and higher	Demonstration of knowledge and understanding of the topics covered in the course, including an ability to apply this to solving problems.
B	83.5% - 86.49%	Demonstration of knowledge and understanding of most of the topics covered in the course, with ability to apply this knowledge to solving problems.
C	73.5% - 76.49%	Demonstration of familiarity and some understanding of most of the topics covered in the course, together with ability to solve some problems based on these topics.
D	65% - 66.5%	Demonstration of familiarity with most of the topics covered in the course, and at least a modest ability to solve some problems based on these topics.
F	64.99% and lower	Failure to demonstrate familiarity with most of the topics covered in the course, and little ability to solve problems based on them.

Course Materials

Required Textbooks & Materials

- *Physics for Scientists and Engineers – A strategic approach* second edition.
  Randall D. Knight
  ISBN 0-321-51671-0
- Young and Freedman's *University Physics*

  Knight is recommended for students who prefer a conceptual approach, and Young and Freedman tends to be more theoretical.

Optional Textbooks & Materials

- Any undergraduate Physics text that "talks" to the student.
- www.hyperphysics.phy-astr.gsu.edu for bite-sized step by step information
- scienceworld.wolfram.com for physics and maths assistance
- Scientific calculator and ruler (cm) also required.

Resources

- **Access your course materials**: NYU Classes (nyu.edu/its/classes)
- **Databases, journal articles, and more**: Bobst Library (library.nyu.edu)
- **NYUL Library Collection**: Senate House Library (catalogue.libraries.london.ac.uk)
- **Assistance with strengthening your writing**: NYU Writing Center (nyu.mywconline.com)
- **Obtain 24/7 technology assistance:** IT Help Desk (nyu.edu/it/servicedesk)

Course Schedule (Tentative)

Session/Date	Topic
Session 1: February 4 & 6	Waves. Superposition. Transverse standing waves. Interference. Light. Interference and Diffraction. Single slit diffraction. Gratings. 8 Homework questions due in following week.
Session 2: February 11 & 13	Reflection and refraction. Images. Lenses. Insulators, conductors and Coulomb's law 8 Homework questions due in following week.
Session 3: February 18 & 20	Electric field of a point charge Electric field of many point charges. Electric fields of rings, planes and spheres. 8 Homework questions due in one fortnight.
Session 4: February 25 & 27	FIRST MID-TERM EXAMINATION on topics covered in sessions 1-3.

Session/Date	Topic
Session 5: March 3 & 5	Parallel-plate capacitor. Motion of a charge in an electric field. Electric current. Current density. Conductivity and resistivity. 8 Homework questions due in following week.
Session 6: March 10 & 12	Potential energy of point charges and dipoles. Electric dipole inside a parallel plate capacitor electric potential of point charges 8 Homework questions due in following week.
Session 7: March 17 & 19	Finding the electric field from the potential; a conductor in electrostatic equilibrium; sources of electric potential. Connecting potential and current; capacitance; energy stored in a capacitor. 8 Homework questions due in one fortnight.
Session 8: March 24 & 26	SECOND MID-TERM EXAMINATION on topics from sessions 5-7.
Session 9: March 31 & April 2	Energy and power. Series and parallel circuits. 8 Homework questions due in following week.
Session 10: April 7 & 9	Connecting potential and current. Capacitance. Energy stored in a capacitor. Ohm's law. Kirchoff's laws. 8 Homework questions due in the week after the break.
April 13 to 19	Spring Break: no lectures.
Session 11: April 21 & 23	Moving charges and magnetism. 8 Homework questions due in one fortnight.
Session 12: April 28 & 30	THIRD MID-TERM EXAMINATION on topics from sessions 9-11
Session 13: May 5 & 7	Magnetic dipoles; Ampere's law; solenoids Magnetic forces on individual charges and current-carrying wires Induced currents; motional emf; magnetic flux 8 Homework questions due in following week.

Session/Date	Topic
Session 14: May 12 & 14	Lenz's law; Faraday's law; induced fields. Applications of induced currents; inductors. Electromagnetic Waves. Revision Class. No homework.
Final Assessment:	Thursday, 21 May, 16:30 – 19:00.

Co-Curricular Suggested Activities

- Places of interest: Science Museum (South Kensington), Greenwich Observatory and Maritime Museum (Greenwich)
- The Faraday Effect: This is a tiny museum and exhibition on Faraday's experiments. Trinity Wharf, Greenwich, London
- Public outreach science lectures are regularly announced at www.iop.org and www.royalsoc.org and at most of London's Universities. Also see The Wellcome Trust, Brunell Museum, Thames Barrier for interesting excursions.
- Locally, Science Lectures at UCL on Fridays, 6:30 pm (Chemistry Lecture Theatre).

Classroom Etiquette

- Toilet breaks should be taken before or after class or during class breaks.
- Food should not to be consumed in class.
- Mobile phones should be set on silent and should not be used in class except for emergencies.
- Laptops are only to be used with the express permission of the teacher.
- Please kindly dispose of rubbish in the bins provided.

NYUL Academic Policies

Attendance and Tardiness

- Key information on NYU London's absence policy, how to report absences, and what kinds of absences can be excused can be found on our website (http://www.nyu.edu/london/academics/attendance-policy.html)

Assignments, Plagiarism, and Late Work

- You can find details on these topics and more on this section of our NYUL website (https://www.nyu.edu/london/academics/academic-policies.html) and on the Policies and Procedures section of the NYU website for students studying away at global sites (https://www.nyu.edu/academics/studying-abroad/upperclassmen-semester-academic-year-study-away/academic-resources/policies-and-procedures.html).

Classroom Conduct

Academic communities exist to facilitate the process of acquiring and exchanging knowledge and understanding, to enhance the personal and intellectual development of its members, and to advance the interests of society. Essential to this mission is that all members of the University Community are safe and free to engage in a civil process of teaching and learning through their experiences both inside and outside the classroom. Accordingly, no student should engage in any form of behaviour that interferes with the academic or educational process, compromises the personal safety or well-being of another, or disrupts the administration of University programs or services. Please refer to the NYU Disruptive Student Behavior Policy for examples of disruptive behavior and guidelines for response and enforcement.

Disability Disclosure Statement

Academic accommodations are available for students with disabilities. Please contact the Moses Center for Students with Disabilities (212-998-4980 or mosescsd@nyu.edu) for further information. Students who are requesting academic accommodations are advised to reach out to the Moses Center as early as possible in the semester for assistance.

Instructor Bio

The focus of my work to date has been on the modulated magnetic structures of rare-earth alloys and uranium compounds and the transitions between them. To explore the phase transitions and the coupling between the spin and lattice systems I mostly have been involved with thermal expansion, magnetostriction and neutron scattering studies.

I did my undergraduate degree in physics at McMaster University, Hamilton, Canada. From there I went down the road as an NSERC '67 Science Scholarship holder and Massey College Fellow to the University of Toronto. At Toronto I received my M.Sc. (Ultrasonic study of CrMn) and my Ph.D. (Magnetic Phase Diagrams of Nd and NdPr) as a student of Professor Eric Fawcett. During this time, I also spent six enjoyable months as Acting Dean of Men at Victoria University in the University of Toronto.

From the University of Toronto, I moved to Birkbeck College, London, where I held postdoctoral positions in the physics and chemistry departments. In 1992, I was appointed to a lectureship in physics at Birkbeck. I went to the Condensed Matter and Material Physics group at UCL in 1997. At UCL, I was the Undergraduate Programme Tutor for ten years and am now the Postgraduate (Research) Tutor. I have been with NYU London for over 10 happy years.