

Kingsborough Community College  
The City University of New York  
Department of Physical Sciences  
**PHY1400 - Advanced General Physics II**  
Syllabus

PHY1400 – ADVANCED GENERAL PHYSICS II (4 crs. 6 hrs.)

Second term of PHY 1300. Topics include sound, electricity, magnetism and optics. Laboratory sessions included.  
Prerequisite: PHY1300 Pre/Co-requisite: MAT1600 Required Core: Life and Physical Sciences Flexible Core: Scientific World (Group E)

Section: SECTION NUMBER

Time: LECTURE AND LABORATORY SCHEDULE FOR SECTION

Room: ROOM (S) FOR SECTION

Instructor: INSTRUCTOR FOR SECTION

Email: EMAIL ADDRESS FOR INSTRUCTOR FOR SECTION

Office Hours: OFFICE HOURS FOR INSTRUCTOR FOR SECTION

**Source materials:** The textbook is *Physics for Scientists & and Engineers* by D. Giancoli, 4th edition Vol. 2 with *Mastering Physics* web tool. Scientific calculator – You may not use a cell phone as a calculator on an exam!

**Student Learning Outcomes** Students will:

Understand and be able to solve problems involving longitudinal waves and transverse waves.

Understand and be able to solve problems involving Electric Force.

Understand and be able to solve problems involving Electric Field.

Understand and be able to solve problems involving Electric Potential & Electric Potential Energy.

Understand and be able to solve problems involving Electric Current.

Understand and be able to solve problems involving DC Circuits.

Understand and be able to solve problems involving Magnetism & Magnetic Fields.

Understand and be able to solve problems involving Electromagnetic Induction.

Understand and be able to solve problems involving Faraday's Law.

Understand and be able to solve problems involving Electromagnetic Waves & Light.

Understand and be able to solve problems involving Geometric Optics & Optical Instruments.

**Topical Outline Lecture:** (Approximate and subject to change upon notification)

Week	Topics	Book Chapter(s)
1	Longitudinal & Traverse Waves	16
2-3	Electric Charge & Electric Field	21 & 22
3-4	Electric Potential & Electric Potential Energy	23
5	Capacitance Electric Energy Storage Dielectrics *	24
6-7	Electric Current	25
7-8	DC Circuits	26
9	Magnetism & Magnetic Fields	27 & 28
10	Electromagnetic Induction & Faraday's Law	29 & 30
11	Electromagnetic Waves & Light	31
12	Geometric Optics & Optical Instruments	32,33,34 &35
13	Final Exam	

**Recommended Chapter Reading & Problems:** (Approximate and subject to change upon notification)

Chapter	Sections	Homework problems
16	16-1 Characteristics of Sound 16-2 Mathematical Representation of Longitudinal Waves 16-3 Intensity of Sound: Decibels 16-4 Sources of Sound: Vibrating Strings and Air Columns *16-5 Quality of Sound, and Noise; Superposition 16-6 Interference of Sound Waves; Beats 16-7 Doppler Effect	TBD
21	21-1 Static Electricity; Electric Charge and Its Conservation 21-2 Electric Charge in the Atom 21-3 Insulators and Conductors 21-4 Induced Charge; the Electroscope 21-5 Coulomb's Law 21-6 The Electric Field 21-7 Electric Field Calculations for Continuous Charge Distributions 21-8 Field Lines 21-9 Electric Fields and Conductors 21-10 Motion of a Charged Particle in an Electric Field 21-11 Electric Dipoles	TBD
22	22-1 Electric Flux 22-2 Gauss's Law 22-3 Applications of Gauss's Law	TBD
23	23-1 Electric Potential Energy and Potential Difference 23-2 Relation between Electric Potential and Electric Field 23-3 Electric Potential Due to Point Charges 23-4 Potential Due to Any Charge Distribution 23-5 Equipotential Surfaces 23-6 Electric Dipole Potential 23-7 E Determined from V 23-8 Electrostatic Potential Energy; the Electron Volt	TBD
24	24-1 Capacitors 24-2 Determination of Capacitance 24-3 Capacitors in Series and Parallel 24-4 Electric Energy Storage 24-5 Dielectrics	TBD
25	25-1 The Electric Battery 25-2 Electric Current 25-3 Ohm's Law: Resistance and Resistors 25-4 Resistivity 25-5 Electric Power 25-6 Power in Household Circuits 25-7 Alternating Current 25-8 Microscopic View of Electric Current: Current Density and Drift Velocity	TBD
26	26-1 EMF and Terminal Voltage 26-2 Resistors in Series and in Parallel 26-3 Kirchoff's Rules 26-4 EMFs in Series and in Parallel; Charging a Battery 26-5 Circuits Containing Resistor and Capacitor (RC Circuits) 26-7 Ammeters and Voltmeters	TBD
27	27-1 Magnets and Magnetic Fields 27-2 Electric Currents Produce Magnetic Fields 27-3 Force on an Electric Current in a Magnetic Field; Definition of 27-4 Force on an Electric Charge Moving in a Magnetic Field 27-5 Torque on a Current Loop	TBD
28	28-1 Magnetic Field Due to a Straight Wire 28-2 Force between Two Parallel Wires 28-3 Definitions of the Ampere and the Coulomb 28-4 Ampere's Law 28-5 Magnetic Field of a Solenoid and a Toroid 28-6 Biot-Savart Law	TBD
29	29-1 Induced EMF 29-2 Faraday's Law of Induction; Lenz's Law 29-3 EMF Induced in a Moving Conductor 29-4 Electric Generators	TBD
30	30-1 Mutual Inductance 30-2 Self-Inductance 30-3 Energy Stored in a Magnetic Field 30-4 LR Circuits 30-5 LC Circuits and Electromagnetic Oscillations 30-6 LC Oscillations with Resistance (LRC Circuit)	TBD
32	32-1 The Ray Model of Light 32-2 The Speed of Light and Index of Refraction 32-3 Reflection; Image Formation by a Plane Mirror 32-4 Formation of Images by Spherical Mirrors 32-5 Refraction: Snell's Law 32-6 Visible Spectrum and Dispersion 32-7 Total Internal Reflection	TBD
33	33-1 Thin Lenses; Ray Tracing 33-2 The Thin Lens Equation; Magnification 33-3 Combinations of Lenses 33-4 Lensmaker's Equation 33-5 Cameras, Film and Digital 33-6 The Human Eye; Corrective Lenses 33-7 Magnifying Glass 33-8 Telescopes	TBD
34	34-1 Waves Versus Particles; Huygens' Principle and Diffraction 34-2 Huygens' Principle and the Law of Refraction 34-3 Interference—Young's Double-Slit Experiment 34-4 Intensity in the Double-Slit Interference	TBD
35	35-1 Diffraction by a Single Slit or Disk 35-2 Intensity in Single-Slit Diffraction Pattern 35-3 Diffraction in the Double-Slit Experiment	TBD

**Grades:**

Grades are calculated from a weighted average of exams, lab scores, and the final exam. 3 Lecture Exams - 35% , Laboratory performance - 15% , Web Assignments & Homework 25%, Cumulative Final Exam - 25% Grades will be awarded as follows: 93% or above=**A**; 90-92.99%=**A-**; 87-89.99%=**B+**; 83-86.99%=**B**; 80-82.99%=**B-**; 77-79.9%=**C+**; 73-76.99%=**C**; 70-72.99%=**C-**; 67-69.99%=**D+**; 63-66.99%=**D**; 60-62.99%=**D-**; <60%=**F**

### Missed Exam/Laboratory/Assignment Policy

If you miss an opportunity to demonstrate your knowledge of the subject matter by missing a duly scheduled exam, laboratory or other assignment, the grading scheme does not apply. Your grade will be determined at the discretion of the instructor. By missing a duly scheduled exam, laboratory or other assignment, you accept and recognize that the instructor must determine your grade within the context of determining the grade of students who did not miss a duly scheduled exam, laboratory or other assignment. Instructor Make-up Policy: SUGGESTED: NO MAKE-UP EXAMS, NO MAKE-UP LABORATORIES OR NO MAKE-UP OTHER ASSIGNMENTS. FINAL EXAM WEIGHTED WITH PENALTY (0-100%) FOR MISSED WORK

**Lecture attendance:** Attending all classes is mandatory. The textbook is a guide for the course additional material will be covered during lecture meetings. If you miss class, you will miss out on taking notes and this will affect your ability to study for tests and quizzes. Except in extreme cases there can be no makeup exams and missing one is grounds for failure of the course. At all times, if you have any questions or need help, please ask your instructor. If you are having difficulties with the course, or if your life is affecting your performance in class, or your ability to attend, let me know as soon as problems arise.

**Homework:** will be assigned using *Mastering Physics* web tool. Each homework assignment has due date. Late submissions are not graded. Average homework score will be used in the course grade.

### Laboratory

Date	Topic	Requirements
Meeting 1	Transverse Waves on a String	Hand in
Meeting 2	Resonant Air Column – Speed of Sound	Hand in
Meeting 3	Electric Field Mapping	Hand in
Meeting 4	Electric Circuits I (Ohm's Law)	Hand in
Meeting 5	The Electrical Equivalent of Heat	Hand in
Meeting 6	Electric Circuits II (Series and Parallel Connections)	Hand in
Meeting 7	Electric Circuits III (Kirchhoff's Rules)	Hand in
Meeting 8	Current Balance	Hand in
Meeting 9	Transformer	Hand in
Meeting 10	RLC Circuits	Hand in
Meeting 11	Focal Length of a Thin Lens	Hand in
Meeting 12	Double-Slit Diffraction Patterns	Hand in

**Laboratory Manual:** All labs are posted on the physical science department webpage. Labs need to be downloaded and read before coming to lab. You will not be permitted in the laboratory if you do not have a copy of the experiment.

**Note on laboratory component:** The laboratory component counts for 15% of your overall result. Failure to pass the laboratory component of the course will result in a grade of F in the course. It is important to note that the laboratory component of the course serves a dual purpose. It offers the opportunity for students to deepen their understanding of a specific experimental science. The laboratory also offers the instructor an opportunity to assess each student's competence in the subject area. The laboratory grade is based on the quality of your work in the laboratory and the quality of your laboratory assignments. Laboratory instructors may assess your competence in the subject through the use of pre-lab assignments, reports, quizzes or practical examinations. All laboratory meetings are mandatory. Performing an experiment at an alternate time will be considered only under exceptional cases. If you miss more than one laboratory meeting you may fail the laboratory portion of the course and, hence, the entire course. All laboratory assignments must be completed and handed in within the time limits set by your laboratory instructor. Laboratory meetings are subject to the regulations of the New York City Fire Department and the laws of the State of New York. If your instructor is concerned that you are unprepared or unable to safely complete a given experiment you may be asked to leave the laboratory and will not receive credit for the meeting. Examples of reasons for an instructor's duty of action include a student arriving late to the meeting, improper attire, failure to study the laboratory experimental protocol, or a general lack of laboratory competence.

**Conduct:** Students are required to follow *The Student Code of Conduct* as stated in the *Student Handbook*.

**Accessibility:** Access-Ability Services (AAS) serves as a liaison and resource to the KCC community regarding disability issues, promotes equal access to all KCC programs and activities, and makes every reasonable effort to provide appropriate accommodations and assistance to students with disabilities. You must contact Access-Ability Services if you require such accommodations and assistance. Your instructor will make the accommodations you need, but you must have documentation from the Access-Ability office for any accommodations.