



PHYS 021: General Physics II

Term: 2020 Winter Session

Instructor: Staff

Language of Instruction: English

Classroom: TBA

Office Hours: TBA

Class Sessions Per Week: 6

Total Weeks: 4

Total Class Sessions: 25

Class Session Length (minutes): 145

Credit Hours: 5

Course Description:

This course is a continuation of the study of General Physics I. Students will discuss the following main topics, including: electricity and magnetism, the study of natural phenomena in the fields of electromagnetism, light, geometrical and wave optics, and quantum physics. Some concepts from General Physics I, such as: position, velocity, acceleration, force, Newton's laws of motion, work and energy will appear once again here. Moreover, some modern physics topics will also be discussed. This course is calculus based.

Course Materials:

Textbook:

Fundamentals of Physics, David Halliday, Robert Resnick, Jearl Walker, 10th edition.

Course Format and Requirements:

This class is in the format of lectures. Attendance is vital to get a thorough understanding of the material. Students are responsible for lecture notes, any course material handed out, and attendance in class, while attendance will not to be formally recorded.

Attendance:



Students are expected to attend and participate in class. Strong attendance and participation are good indicators of success. Each student is responsible for all course material, announcements, quizzes and exams made in class, whether or not the student attended that day's class.

Grading Scale:

A+: 98%-100%

A: 93%-97%

A-: 90%-92%

B+: 88%-89%

B: 83%-87%

B-: 80%-82%

C+: 78%-79%

C: 73%-77%

C-: 70%-72%

D+: 68%-69%

D: 63%-67%

D-: 60%-62%

F: Below 60%

Course Assignments:

Homework

There will be 6 homework assignments randomly assigned through the whole semester. No late HWs will be accepted.

Quizzes

Quizzes will be based on the homework problems, and will be given on the beginning of class. There will be 6 quizzes during the semester and the lowest scores will be dropped, no make-up quiz will be provided.

Exams

There will be two in-class midterm exams and one cumulative final exam. The exams will be based on the homework, textbook, and lectures. Both quantitative and conceptual questions will appear on the exams. A formula sheet will be provided with the exam. Students will need to bring a calculator to all exams.

**Course Assessment:**

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| Homework | 10% |
| Quizzes (5 out of 6) | 15% |
| Midterm Exams 1 | 20% |
| Midterm Exams 2 | 20% |
| Final Exam | 35% |
| Total | 100% |

Course Schedule:

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| Week 1- Class 1 | Week 1- Class 2 |
| Overview of the course; Go through syllabus; Electric Charge; Coulomb's Law | Electric Fields; Test Charge; Superposition of Fields; Field-Line Diagrams |
| Week 1- Class 3 | Week 1- Class 4 |
| Superposition of Fields (Cont.); Field-Line Diagrams (Cont.) | <u>Quiz 1</u> Conductors; Electric Potential Energy; |
| Week 1- Class 5 | Week 1- Class 6 |
| Voltage Resistance; | Resistance (Cont.); Dielectrics |
| Week 2- Class 7 | Week 2- Class 8 |
| Current; Circuits, Current, Ohm's Law | <u>Quiz 2</u> Ohm's Law; Resistance in parallel; Resistance in series |
| Week 2- Class 9 | Week 2- Class 10 |
| Resistance in parallel (Cont.); Resistance in series (Cont.); | <u>Midterm Exam 1</u> |



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| Review for midterm 1 | |
| Week 2- Class 11 | Week 2- Class 12 |
| Power; Kirchoff's Rules | Capacitor; Capacitance; Capacitance in parallel; Capacitance in series |
| Week 3- Class 13 | Week 3- Class 14 |
| <u>Quiz 3</u> Magnetic fields; Magnetic Forces; | Right Hand Rule; Magnet field and Currents |
| Week 3- Class 15 | Week 3- Class 16 |
| Ampere's Law; Faraday's Law of Induction | <u>Quiz 4</u> Faraday's Law of Induction (Cont.); Lenz's Law, Inductance; Lenz's Law; |
| Week 3- Class 17 | Week 3- Class 18 |
| Electric generators; E-M waves Review for midterm 2 | <u>Midterm Exam 2</u> |
| Week 4- Class 19 | Week 4- Class 20 |
| Frequency, Wavelength; Doppler Effect | Reflection; Geometric Optics; Mirror Equation, Magnification; Refraction, Lens equation |
| Week 4- Class 21 | Week 4- Class 22 |
| <u>Quiz 5</u> Dispersion; Physical Optics; Superposition | Wave properties of light; Interference; Constructive & Destructive, Double Slit; Thin films, Diffraction |
| Week 4- Class 23 | Week 4- Class 24 |
| <u>Quiz 6</u> | Quantum Physics: |



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| Relativity; Time Dilation, Velocity Addition; Mass-Energy Equivalence, General Relativity; | Planck, photons Wave/Particle Duality, Uncertainty Principle |
| Week 4- Class 25 | <u>Final Exam (Cumulative): TBA</u> |
| Fission, Radioactivity, Fusion, Mass/Energy Equivalence; Cosmology & Fundamental Forces Review for final exam | |

Academic Integrity:

Students are encouraged to study together, and to discuss lecture topics with one another, but all other work should be completed independently.

Students are expected to adhere to the standards of academic honesty and integrity that are described in the Shanghai Normal University's *Academic Conduct Code*. Any work suspected of violating the standards of the *Academic Conduct Code* will be reported to the Dean's Office. Penalties for violating the *Academic Conduct Code* may include dismissal from the program. All students have an individual responsibility to know and understand the provisions of the *Academic Conduct Code*.

Special Needs or Assistance:

Please contact the Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material. Our goal is to help you learn, not to penalize you for issues which mask your learning.