• Instructor: Dr. Igor Ostrovskii
• Office: Room 207 Lewis Hall; Email: iostrov@phy.olemiss.edu

SYLLABUS
❖ Lecture: TTh 11:00 – 12:15, Room 101 Lewis Hall
❖ Office Hours: TWF 2:30 – 3:30 p.m. (207 Lewis Hall)
❖ Text: Fundamentals of Physics, 7-th edition, 2005, by David Halliday, Robert Resnik, Jearl Walker; We will cover Chapters 21 through 36.

PLEASE, READ THE BOOK.

➢ Course objectives and goals:
1. Introduce the physics and engineering major students to General Physics II;
2. Expand an understanding of the ideas of the electricity, magnetism and optics;
3. Develop an understanding of the basis of broad knowledge in physics and electrical engineering;
4. Enhance the critical thinking, analytical reasoning and problem solving skills;
5. Discuss the contemporary problems confronting physics and electrical engineering.

• Grading Scale: A’s --------------- 90 – 100
      B’s ------------------ 80 – 89
      C’s ------------------ 70 – 79, Etc.

• EVALUATION: Grades will be based on the home works, tests, and final examination:
  Homework ------- 15 %
  Three tests ------ 45 % (#1=15%, #2=15%, #3=15%)
  Final exam ------- 40 %

  Tests and Final examination schedule:
  Test 1 (Class # 10), Chapters 21 - 27 --------------- Thursday, September 22.
  Test 2 (Class # 18), Chapters 28 - 31 ----------- Thursday, October 20.
  Test 3 (Class # 26), Chapters 32 - 35 --------------- Thursday, November 17.

  ➢ FINAL EXAMINATION ------------ Tuesday, December 6, 8:00 a.m.

• Requirements of the course and Homework rules:
1. Homework is assigned after some sections are covered and is due in a week.
2. Homework paper should be 8.5 x 11 inches with no torn or tattered edges. Homework papers should be stapled.
3. Show all your work; the answer alone is not worth anything. Homework problems must include enough English to be understandable.
4. Homework answers should have units and a reasonable number of significant digits.
5. Circle the finale answers that you want to be graded.

COURSE CONTENT:
1. ELECTRIC CHARGE (Ch. 21) [1 class]
   • Electric charge, Coulomb’s Law, Conservation of charge, Charge is quantized.
2. ELECTRIC FIELDS (Ch. 22) [1 class]
   • Electric field lines, electric field due to different systems of electric charges.
3. GAUSS’ LAW (Ch. 23) [1 class]
   • Flux of an Electric field, Gauss’ Law and Coulomb’s Law, Applications.
4. ELECTRIC POTENTIAL (Ch. 24) & APPLICATIONS [2 classes]
   • Electric potential, electric PE, potential due to different systems of electric charges.
5. CAPACITANCE (Ch. 25) [1 class]
   • Capacitance, Energy stored in electric field, Dielectrics and Gauss’ Law.
6. CURRENT AND RESISTANCE (Ch. 26) [1 class]
   • Electric current, Resistance, Ohm’s Law, Power, Semiconductors.
7. CIRCUITS (Ch. 27) [2 classes]
   • Single-Loop circuits, Emf, Ammeter, Voltmeter, RF circuits.

➢ TEST 1 (CLASS # 10), CHAPTERS 21 - 27 -------------- THURSDAY, SEPTEMBER 22.

8. MAGNETIC FIELDS (Ch. 28) [2 classes]
   • Production of magnetic field, Hall Effect, Cyclotron, Torque on a current loop.
9. MAGNETIC FIELDS DUE TO CURRENTS (Ch. 29) [1 class]
   • Calculation of magnetic field, Ampere’s Law, Solenoids.
10. INDUCTION AND INDUCTANCE (Ch. 30) [2 classes]
    • Faraday’s Law, Lenz’s Law, Energy of magnetic field, PL circuit.
11. ELECTROMAGNETIC OSCILLATIONS AND ALTERNATING CURRENT (Ch. 31) [2 classes]
    • LC Oscillations, Alternating current, RLC circuit, Transformers.

➢ TEST 2 (CLASS # 18), CHAPTERS 28 - 31 ------------- THURSDAY, OCTOBER 20.

12. MAXWELL’S EQUATIONS (Ch. 32) [2 classes]
    • Gauss’ Law for Magnetic field, Displacement current, Maxwell’s Equations.
13. ELECTROMAGNETIC WAVES (Ch.33) [2 classes]
    • Traveling electromagnetic wave, Pointing vector, Radiation pressure, polarization, reflection, refraction.
14. IMAGES (Ch. 34) [1.5 classes]
    • Mirrors, Lenses, Images, Optical instruments.
15. INTERFERENCE (Ch. 35) [1.5 classes]
    • Light waves, Coherence, Interference and Diffraction, Michelson’s interferometer.

➢ TEST 3 (CLASS # 26), CHAPTERS 32 - 35 ----------- THURSDAY, NOVEMBER 17.

16. DIFFRACTION (Ch. 36) [1 class]
    • Diffraction by the slit, circular aperture, double slit; Diffracting grating.
17. REVIEW (Last class # 28) [1 class]

➢ FINAL EXAMINATION ----------- TUESDAY, DECEMBER 6, 8:00 A.M.

* - The dates are tentative, and may be changed (but not Final exam!).