- 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: <u>TWF 2:30 3:30 p.m. (207 Lewis Hall)</u>
- 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.
- <u>Grading Scale</u>: 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 ------ <u>40 %</u> 100 %

• 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.
- <u>Requirements of the course and Homework rules:</u>
- 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 <u>stapled</u>.
- 3. Show all your work; the answer alone is not worth anything. Homework problems must include <u>enough English</u> to be understandable.
- 4. Homework answers should have units and a reasonable number of significant digits.
- 5. <u>Circle the finale answers that you want to be graded.</u>

COURSE CONTENT:

1. ELECTRIC CHARGE (Ch. 21)

- Electric charge, Coulomb's Law, Conservation of charge, Charge is quantized.
- 2. ELECTRIC FIELDS (Ch. 22)
 - Electric field lines, electric field due to different systems of electric charges.

[1 class]

[1 class]

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 Electric potential electric PE potential due to different systems of electric charges. 	[2 classes]
 Electric potential, electric FE, potential due to different systems of electric charges. 5. CAPACITANCE (Ch. 25) Capacitance Energy stored in electric field Dielectrics and Gauss' Law. 	[1 class]
 6. CURRENT AND RESISTANCE (Ch. 26) Electric current, Besistence, Ohm's Law, Bouver, Semisonductors 	[1 class]
 Electric current, Resistance, Ohm s Law, Power, Semiconductors. 7. CIRCUITS (Ch. 27) Single Leon girauits Emf. Ammeter, Voltmeter, PE girauits. 	[2 classes]
 Single-Loop encurs, Enn, Annieter, Voluncter, KF encurs. TEST 1 (CLASS # 10), CHAPTERS 21 - 27 THURSDAY, SEI 	PTEMBER 22.
 8. MAGNETIC FIELDS (Ch. 28) Production of magnetic field Hall Effect. Cyclotron. Torque on a current loop 	[2 classes]
 9. MAGNETIC FIELDS DUE TO CURRENTS (Ch. 29) Calculation of magnetic field Ampere's Law Solenoids 	[1 class]
 10. INDUCTION AND INDUCTANCE (Ch. 30) Faraday's Law Lenz's Law Energy of magnetic field PL circuit 	[2 classes]
 11. ELECTROMAGNETIC OSCILLATIONS AND ALTERNATING CURRENT (Ch. 31) LC Oscillations, Alternating current, RLC circuit, Transformers. 	[2 classes]
> TEST 2 (CLASS # 18), CHAPTERS 28 - 31 THURSDAY, OCTOBER 20.	
 12. MAXWELL'S EQUATIONS (Ch. 32) Gauss' Law for Magnetic field, Displacement current, Maxwell's Equations. 	[2 classes]
13. ELECTROMAGNETIC WAVES (Ch.33)	[2 classes]
 Traveling electromagnetic wave, Pointing vector, Radiation pressure, polarization, ref 14. <i>IMAGES</i> (Ch. 34) Mirrors Lenses Images Optical instruments 	[1.5 classes]
 15. INTERFERENCE (Ch. 35) Light waves, Coherence, Interference and Diffraction, Michelson's interferometer. 	[1.5 classes]
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. <i>REVIEW</i> (Last class # 28) 	[1 class]

> <u>FINAL EXAMINATION</u> ------ TUESDAY, DECEMBER 6, 8:00 A.M.

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