

Course Objectives and Student Outcomes for Physics 222

There are four basic objectives for Physics 222 during the spring semester of 2011. They are the study of mechanical and electromagnetic waves, the study of thermodynamics, the completion of laboratory experiments appropriate to the aforementioned topics, and the application of calculus to the study of these topics. The course outline and schedule is shown on the attached syllabus.

The study of mechanical waves will begin with simple harmonic motion for mass spring systems. Follow on topics will include the characteristics of wave motion in solids, liquids and gases such as propagation, superposition, standing waves, resonance, refraction, reflection and diffraction. A brief study of sound waves will conclude this section of the course.

The study of electromagnetic waves requires the study of both electricity and magnetism. These topics, along with the study of passive components (resistors, capacitors and inductors) and active components (vacuum tubes and transistors,) will be addressed for both direct current and alternating current circuits.

Finally, an introductory study of the basic laws of thermodynamics, the ideal gas law, and their applications will conclude the course.

Each student is expected to study and learn the basic physics associated with mechanical and electromagnetic waves and the thermodynamic concepts of heat, work and energy. Students are expected to attend class, complete assigned homework problems, and conduct assigned experiments including the writing of neat, well thought out laboratory reports. To determine the student's comprehension of these topics, each student will complete several written examinations and their performance will be documented with intermediate grading and a final course grade.

Physics 222 Syllabus/ 2011: Three Rivers Community College/ BLS

1. Jan 24, Brief Review of Mechanics, The Big Picture for this Course, units
Chapter 14: Oscillations (Simple Harmonic Motion)
Chapter 21: Electric Charge and Electric Field
Lab: The Multi-meter
2. Jan 31,
Chapter 15: Mechanical Wave Motion
Chapter 22: Gauss's Law (electric flux)
Lab: Electric Field and Potential
3. Feb 7,
Chapter 16: Sound
Chapter 23: Electric Potential
Lab: Speed of Sound
4. Feb 14, Review Chapters 14, 15, 16, 21, 22, 23
Chapter 24: Capacitance
Chapter 25: Resistance and Electric Current
Lab: Ohm's Law
5. Feb 25, first examination chapters 14, 15, 16, 21, 22 ,23
6. March 7,
Chapter 24: Capacitance
Chapter 26: DC Circuits
Lab: Kirchoff's Rules for DC Circuits
7. Mar 21, review chapters 24, 25 and 26
Lab: Capacitive Circuits
8. Mar 28, Chapters 27 and 28 Magnetism and the Magnetic Field
Second examination chapters 24, 25, 26
9. Apr 4, Chapter 29: Magnetic Induction, Faraday's Law
Lab: Magnetic Induction
10. Apr 11, Fluids Chapter 13, A/C circuits Chapter 30
Lab: Electronic circuits
11. Apr 18, Temperature and the Ideal Gas Law Chapters 17, 18
More A/C circuits Chapter 30
Lab: Thermal Expansion
12. Apr 25, First Law Thermodynamics Chapter 19
Electromagnetic Waves Chapter 31
Lab: Calorimetry
Third Examination chapters 27, 28, 29, 30
13. May 5, Second Law Thermodynamics Chapter 20
Lab: Latent Heat
14. May 9, review chapters 31, 17, 18, 19, 20
15. May 16, Final examination

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