



Alabama Department of Postsecondary Education

Representing Alabama's Public Two-Year College System

Jefferson State Community College

PHY 115 Technical Physics

I. **PHY 115 Technical Physics - 4 Semester Hours**
ASCI (Lec 3 hrs, Lab 2 hrs)

II. **Course Description**

Technical physics is an algebra based physics course designed to utilize modular concepts to include: motion, forces, torque, and electricity. Results of physics education research and physics applications in the workplace are used to improve the student's understanding of physics in technical areas. Upon completion, students will be able to: define motion and describe specific module concepts; utilize microcomputers to generate motion diagrams; understand the nature of contact forces and distinguish passive forces; work cooperatively to set-up laboratory exercises; and demonstrate applications of module-specific concepts.

III. **Prerequisite**

MTH 100

IV. **Textbook**

Introductory College Physics: 21st Century. Seminole Community College, Ztek Co.2005, available in Jefferson State Pioneer Bookstore.

V. **Course Objectives**

The student will:

- A. Develop understanding of introductory physics concepts with an emphasis on motion, force, torque and electricity.
- B. Develop basic laboratory skills.

VI. **Evaluation and Assessment**

Specific information on how grade is determined to be included.

Classroom measures developed by individual instructors will be used to measure student achievement of the above stated objectives at a 70 percent minimum level of performance.

Grades will be given based upon A = 90 – 100%, B = 80 – 89%, C = 70 – 79%, D = 60 – 69%, and F = below 60%.

VII. Class Activities

- A. Lecture
- B. Discussion
- C. Experimentation
- D. Demonstration
- E. Recitation
- F. Written examination

VIII. GENERAL COURSE COMPETENCIES

The course uses a new modular approach called Introductory College Physics: Twenty First Century - ICP/21.

- A. By completion of Module 1 the student will be able to:
 - 1. Define motion and describe concepts of position, time displacement, velocity, speed, frame of reference and acceleration.
 - 2. Utilize microcomputers to generate motion diagrams and interpret them properly.
 - 3. Define and distinguish between vector and scalar quantities.
 - 4. Using algorithms of ALPS exercises, set up and solve problems dealing with 1-D and 2-d motions.
 - 5. Work together and cooperatively set up laboratory exercises, interpret data and discuss solutions to given problems.
- B. By completion of Module 2 the student will be able to:
 - 1. Understand the nature of contact forces as well as action-at-a-distance.
 - 2. Define and distinguish passive forces from one another and their importance in force diagrams.
 - 3. Define and understand the 3 laws of motion.
 - 4. Be able to draw free body diagram for non-trivial situations.
 - 5. Utilize microcomputers to perform related experiments.
 - 6. Use algorithm of ALPS exercises to solve problems dealing with laws of motion.
 - 7. Work together and cooperatively do experiments and discuss solutions to the given problems.
- C. By the completion of Module 3 the student will be able to:
 - 1. Describe rigid body and study its motion.
 - 2. Understand torque and its rotational effect.
 - 3. Define center of gravity.
 - 4. Investigate static equilibrium of rigid body.
- D. By completion of Module 4 the student will be able to:
 - 1. Explain most of basic electric phenomena such as circuit, source of moving charge, current, resistance, voltage.
 - 2. Be able to recognize basic circuit configurations and the properties common to all like circuits.

3. Be able to compute expected values of the current and potential differences given the circuit parameters.
4. Be able to determine the sources of problems in a non-functioning circuit.
5. Be able to analyze circuits using energy methods.

IX. Attendance

Students are expected to attend all classes for which they are registered. Students who are unable to attend class regularly, regardless of the reason or circumstance, should withdraw from that class before poor attendance interferes with the student's ability to achieve the objectives required in the course. Withdrawal from class can affect eligibility for federal financial aid.

X. Statement on Discrimination/Harassment

The College and the Alabama State Board of Education are committed to providing both employment and educational environments free of harassment or discrimination related to an individual's race, color, gender, religion, national origin, age, or disability. Such harassment is a violation of State Board of Education policy. Any practice or behavior that constitutes harassment or discrimination will not be tolerated.

XI. Americans with Disabilities

The Rehabilitation Act of 1973 (Section 504) and the Americans with Disabilities Act of 1990 state that qualified students with disabilities who meet the essential functions and academic requirements are entitled to reasonable accommodations. It is the student's responsibility to provide appropriate disability documentation to the College. The ADA Accommodations office is located in FSC 300 (205-856-7731).