| **PROFESSOR:** |   |
| --- | --- |
| **OFFICE LOCATION:** |   |
| **OFFICE HOURS:** |   |
| **PHONE NUMBER:** |   |
| **E-MAIL:** |   |
| **SEMESTER:** |   |
| **DELIVERY METHOD:** |   |

# COURSE NUMBER AND TITLE, CATALOG DESCRIPTION, CREDITS:

## PHY 2049L General Physics II Laboratory (1 Credit)

This laboratory course accompanies PHY 2049 and is the second part of a sequence of two courses. The sequence includes investigations that illustrate and explore concepts and principles related to force and motion, work and energy, rotation, gravity, properties of matter, electric charges and currents, resistance and capacitance, magnetism and electromagnetic induction, optics, and nuclear radiation. The course is designed to encourage the concept of “learning by doing” and enhance student learning of physical concepts. It introduces students to experimental procedures, techniques and equipment; it involves setting up the laboratory equipment, collection of data, interpretation of experimental data and preparation of a lab report.

## PREREQUISITES FOR THIS COURSE:

PHY 2048 and PHY 2048L with a minimum grade of “C” in each course

### CO-REQUISITES FOR THIS COURSE:

PHY 2049

## GENERAL COURSE INFORMATION:

Topic Outline

Thermal coefficient of linear expansion

Specific heat of metals

Latent heats of fusion and vaporization

Fields and equipotentials

Ohm’s law

Resistances in series and parallel; the Wheatstone bridge

Joule heat

The temperature dependence of resistance

The RC time constant

Earth’s magnetic field

Electromagnetic induction

AC circuits

Introduction to the oscilloscope

Geometric optics: reflection, and refraction

Spherical mirrors and lenses

The prism spectrometer: dispersion and the index of refraction

Polarization of light

Detection of nuclear radiation

## ALL COURSES AT FLORIDA SOUTHWESTERN STATE COLLEGE CONTRIBUTE TO THE GENERAL EDUCATION PROGRAM BY MEETING ONE OR MORE OF THE FOLLOWING GENERAL EDUCATION COMPETENCIES:

**C**ommunicate clearly in a variety of modes and media.

**R**esearch and examine academic and non-academic information, resources, and evidence.

**E**valuate and utilize mathematical principles, technology, scientific and quantitative data.

**A**nalyze and create individual and collaborative works of art, literature, and performance.

**T**hink critically about questions to yield meaning and value.

**I**nvestigate and engage in the transdisciplinary applications of research, learning, and knowledge.

**V**isualize and engage the world from different historical, social, religious, and cultural approaches.

**E**ngage meanings of active citizenship in one’s community, nation, and the world.

A. General Education Competencies and Course Outcomes

1. Listed here are the course outcomes/objectives assessed in this course which play an integral part in contributing to the student’s general education along with the general education competency it supports.

 General Education Competency: Evaluate

 Course Outcomes or Objectives Supporting the General Education Competency Selected:

 Investigate and identify thermal properties and processes, and determine experimentally the values of certain heat constants for various metals and liquids.

 Draw and interpret the electric field due to a configuration of charges, and use the results to identify the equipotential lines.

 Investigate and verify the approximate nature of Ohm’s “law” and apply it to calculate the equivalent resistance of resistors in series and in parallel.

 Investigate the concept of joule heat, explain the factors it depends on, and experimentally measure the electrical equivalent of heat.

 Recognize and investigate the relationship between temperature and electrical resistance, and between electric potential and electric current; interpret and evaluate the nature of these relationships.

 Investigate direct current circuits containing capacitors and resistors, determine the RC time constant, and explain what its value means in terms of circuit characteristics.

 Draw and interpret the magnetic field of a bar magnet and use its interaction with Earth’s magnetic field to estimate the latter’s strength.

 Explore the nature of a changing magnetic field, and relate electromagnetic induction to everyday phenomena.

 Investigate alternating current (RLC) circuits using an oscilloscope, compare predicted values of the voltages and impedance of a circuit with their measured values, and draw appropriate phasor diagrams.

 Investigate the behavior of light as it propagates through a medium, explain the “laws” of reflection and refraction and how images form, and measure experimentally the index of refraction of a glass plate.

 Investigate the behavior of light as it travels through filters and dispersive media and explain the resulting polarization and dispersion.

 Investigate the principles of nuclear radiation, explain how a Geiger counter works, and experimentally test the inverse square law for nuclear radiation.

## DISTRICT-WIDE POLICIES:

### PROGRAMS FOR STUDENTS WITH DISABILITIES

Florida SouthWestern State College, in accordance with the Americans with Disabilities Act and the College’s guiding principles, offers students with documented disabilities programs to equalize access to the educational process. Students needing to request an accommodation in this class due to a disability, or who suspect that their academic performance is affected by a disability should contact the Office of Adaptive Services at the nearest campus. The office locations and telephone numbers for the Office of Adaptive Services at each campus can be found at <https://www.fsw.edu/adaptiveservices>.

### REPORTING TITLE IX VIOLATIONS

Florida SouthWestern State College, in accordance with Title IX and the Violence Against Women Act, has established a set of procedures for reporting and investigating Title IX violations including sexual misconduct. Students who need to report an incident or need to receive support regarding an incident should contact the Equity Officer at equity@fsw.edu. Incoming students are encouraged to participate in the Sexual Violence Prevention training offered online. Additional information and resources can be found on the College’s website at <https://www.fsw.edu/sexualassault>.

## REQUIREMENTS FOR THE STUDENTS:

List specific course assessments such as class participation, tests, homework assignments, make-up procedures, etc.

## ATTENDANCE POLICY:

The professor’s specific policy concerning absence. (The College policy on attendance is in the Catalog and defers to the professor.)

## GRADING POLICY:

Include numerical ranges for letter grades; the following is a range commonly used by many faculty:

| **Grade Percent** | **Letter Grade** |
| --- | --- |
| 90 - 100 | A |
| 80 - 89 | B |
| 70 - 79 | C |
| 60 - 69 | D |
| Below 60 | F |

(Note: The “incomplete” grade [“I”] should be given only when unusual circumstances warrant. An “incomplete” is not a substitute for a “D,” “F,” or “W.” Refer to the policy on “incomplete grades.)

## REQUIRED COURSE MATERIALS:

(In correct bibliographic format.)

## RESERVED MATERIALS FOR THE COURSE:

Other special learning resources.

## CLASS SCHEDULE:

This section includes assignments for each class meeting or unit, along with scheduled Library activities and other scheduled support, including scheduled tests.

## ANY OTHER INFORMATION OR CLASS PROCEDURES OR POLICIES:

(Which would be useful to the students in the class.)