FLORIDA SOUTHWESTERN STATE COLLEGE

School of Pure and Applied Sciences

Physical Science

Instructor Information

Instructor: Marius Coman, Ph. D.
Email: use canvas' email

Course Information

Course: PHY 2049L, GEN PHYSICS II LAB (GEN PHYSICS II LAB)
Section Number: 20B
Course Reference Number: 24635
Delivery Method: Blended On-Campus
Campus: Collier

Credit Hours: 1 Credits - 2 Lab Hours

Course Description: 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.

This is a blended course!

It combines online and in-person instruction, providing flexibility to complete your coursework and time to interact with your professor and peers in person.

FSW Blended-On Campus
In a Blended course your professor will mix required on campus class meetings with online coursework. The online portion of the course may be live in a virtual Zoom classroom or all asynchronous in Canvas. All required class meeting dates and times will be posted in the course schedule for you to plan for.

Blended Courses Explained
https://www.youtube.com/watch?v=qoqbU-klK0M&t=146s

Course Location

Collier Campus, SCIENCES BUILDING - E - 109

Thursday 2:30 pm - 4:15 pm

Prerequisites/Co-requisites

Course Prerequisites: PHY 2048 and PHY 2048L with a minimum grade of "C" in each course

Course Co-requisites: PHY 2049

Topic Outline

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

Student Learning Outcomes

All courses at Florida SouthWestern State College contribute to the General Education Program by meeting one or more of the following General Education Competencies:

Communicate clearly in a variety of modes and media.
Research and examine academic and non-academic information, resources, and evidence.
Evaluate and utilize mathematical principles, technology, scientific and quantitative data.
Analyze and create individual and collaborative works of art, literature, and performance.
Think critically about questions to yield meaning and value.
Investigate and engage in the transdisciplinary applications of research, learning, and knowledge.
Visualize and engage the world from different historical, social, religious, and cultural

approaches.
Engage 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.

Academic Integrity Policy

At FSW, we believe in the power of honesty and integrity as the pillars of academic excellence. As part of our college community, it's crucial that you understand the importance of these values in your academic journey. All work submitted by students for credit in this course is required to adhere to FSW's Academic Integrity Policy. This means cheating on coursework is unacceptable, will receive a "0" grade, and may be subject to disciplinary action. FSW faculty may use Turnitin, Packback, CheckGPT, or similar tools to evaluate coursework for plagiarism and/or artificial intelligence (AI) generated content.

Cheating or other academic misconduct can include, but is not limited to:

- Copying information from published or unpublished sources (online or in print) without citing those sources.
- Copying someone else's work or allowing someone else to copy yours.
- Submitting written work generated by AI as your own without direct authorization from your professor.
- Submitting work for credit that has already been submitted for credit in another class, even if you wrote it.
- Unethical distribution or use of exam content.

According to the Academic Policies and Procedures section of the College Catalog, "Those in charge of academic tasks have an obligation to make known the standards and expectations of acceptable academic conduct. Each student has an obligation to know and understand those standards and expectations." As such, each student should

review the policies and procedures outlined in the Academic Integrity Policy and expect that any violation of these policies will be subject to disciplinary action.

If you have any questions about these principles, reach out to your professor. They are here to help you succeed. Let's work together to maintain an honest, vibrant learning environment at FSW!

Institution 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 each campus are located on the Office of ADAptive Services website.

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.

Financial Aid and Attendance Verification

Florida SouthWestern State College, in accordance with Federal Regulations, is responsible for verifying student attendance and engagement in classes before federal financial aid funds are distributed. In order to demonstrate both your attendance and engagement in this class, you will need to complete the attendance verification assignment within the first week of class. To complete the assignment, click on the

“Attendance Verification” link on the Canvas course menu. Additional information and resources can be found on the College’s Financial Aid website.

School Policies

Extra Credit: All extra credit opportunities offered in any School of Pure and Applied Science course must be offered equally to all students in the class, and cannot account for more than 5% of the overall course grade.

Course Assessment

This course will be assessed by a combination of class participation, graded lab activities and reports, module/unit quizzes, and/or a comprehensive final exam.

Requirements for Students

- The lab report is due at the end of each laboratory session.
- Each laboratory report is completed and submitted individually.

Lab Safety and Best Practices

Students are expected to follow any and all safety guidelines or procedures as directed by their instructor. Some basic best practices that should be followed in all laboratory classes are:

1. Closed-toe shoes should be worn at all times.
2. Hands should be washed before and after all lab activities.
3. Food should never be consumed in laboratory classrooms.
4. Do not attempt to clean broken glassware yourself. Please alert your professor to any cracked, or broken glass. Your instructor will dispose of these in designated containers.
5. Follow your professor’s instructions on chemical or biological waste disposal to ensure correct disposal in designated containers.

6. If your instructor requires that you wear any Personal Protective Equipment (PPE – including, but not limited to, safety goggles, aprons, gloves, and face masks), please wear them as instructed to do so.

Attendance Policy

Attendance in class is your responsibility.

As mentioned below a big part of your grade is derived from the lab reports.

This course/lab is designed to encourage experiential learning of the physics concepts “by doing” through hands on investigations.

Reflecting upon this experience, making generalizations based on experiments enables you to tackle new situations effectively.

Physics, by excellence, improves your analytical and critical thing skills.

Grading Policy

Your final grade is calculated as a weighted average:

$$\text{Final Grade} = \overline{\text{Lab Reports}} \cdot \frac{50}{100} + \overline{\text{Quizzes}} \cdot 0.2 + (\text{Exam}) \cdot 0.1$$

$$\overline{\text{Lab Reports}} = \frac{\sum_{i=1}^{12} \text{Lab Report}_i}{12}$$

$$\overline{\text{Quizzes}} = \frac{\sum_{j=1}^{12} \text{Quiz}_j}{12}$$

The weights for lab reports, quizzes and the exam are specified in the following table:

Assessment tool	Weight in %
12 Lab Reports	70.0
12 Quizzes	20.0
1 Exam: an experiment in itself	10.0
Total:	100

The following range will be used to determine your final course grade:

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

Withdrawals: It is the student's responsibility to withdraw officially from any class that they cease to attend. Failure to do so will result in the recording of an "F" grade.

(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.)

LATE WORK POLICY:

Required Course Materials

No lab manual required
Additional Information
No lab manual/textbook required

Visit the FSW Bookstore to find required course materials.

Additional Required Materials for FSW Online Courses

FSW Online courses (including online, live online, blended online, and flex modalities) also require the following materials:

- **External webcam** and microphone (to take proctored tests and/or final exams.)
- Laptop or desktop computer with an up-to-date operating system (see Semester Start-Up Check-List for details).
- Stable high-speed internet

As scrap paper is not authorized during online exams, it is recommended that students consider the following if authorized for use:

- Small, lap-sized, dry-erase board
- Dry erase marker(s)

Class Schedule

Jan 11 in class
Syllabus presentation,
Exp 1 Thermometers Fixed points

Jan 18 zoom
Exp 2 Thermal Coefficient of Linear Expansion

Jan 25 in class
Exp 3 Specific Heat of metals

Feb 1 zoom
Exp 4 Ideal Gas Law

Feb 8 in class
Exp 5 Latent Heats/Joule Heat

Feb 15 zoom

Exp 6 Mapping Electric Fields &Equipotentials

Feb 22 in class
Exp 7 Ohm's Law

Feb 29 zoom
Exp 8 Resistances in Series & Parallel

March 7 in class
Exp 9 The RC time constant

March 21 zoom
Exp 10 Electromagnetic Induction/AC circuits

March 28 in class
Exp 11 Reflection & Refraction/Dispersion

Apr 4 zoom
Exp 12 Spherical Mirrors & Lenses

Apr 11 in class
Exp 13 Nuclear Radiation/Attenuation

Apr 18 zoom

Exp 14 Polarization of light

Tutoring and Support Services

Academic Tutoring

FSW provides professional in-person and online tutoring through its Tutoring Centers located inside the campus library. Tutoring Centers consist of the Math Center, the Writing Center, and the Peer-Tutoring Center. In addition to on-campus tutoring services, the College provides all students 24/7 access to Tutor.com.

For additional help with this course, the student may:

1. Meet with the Professor during posted office hours.
2. Seek On-Campus Assistance: Each Campus, as well as the Hendry/Glades Center, has at least one place where students can go for assistance with academics. All are available to each student, regardless of the location or type (on-campus, online, etc.) of the class.
3. Request a tutor from the Florida SouthWestern State College Peer Tutoring Center.
4. Use the Online 24/7 Tutoring Services (tutor.com). Look for the link in your Canvas course navigation menu.
5. Use the **FSW Math Tutorials** link located in Canvas for additional math resources (videos, links to resources, etc.) by topic.

BUCS Care Services

Bucs Care Services is focused on educating and informing the community through caring, advocacy, and supportive endeavors. FSW cares about our student's holistic development and wellness. We believe that for all students to be successful, support must be given on an emotional, social, physical, and intellectual basis.

Care Services include:

- Wellness Hub (Mindfullness@FSW)
- Care Pantry
- Mental Health Services
- Public Health Resources
- Active Minds
- Homeless Student Resources

If you feel you are struggling and need to speak with someone concerning personal issues, please do not hesitate to contact the Care Services office via email (bucscare@fsw.edu) or phone (239-489-9046) for community resources and group counseling.

All of these services are available to the student at no additional cost.

Any other information or class procedures or policies

Only those students enrolled in class, or those persons who have authorization to be in attendance for a particular class, will be permitted to attend the class.

TECHNICAL DIFFICULTIES: Students who experience technical difficulties must contact the professor immediately and attach a screenshot of the issue. If technical problems continue with students' personal computers, it is their responsibility to contact technical support and/or use the computers available on Florida SouthWestern State College campuses to complete the assignments.

This Syllabus is subject to reasonable changes at the discretion of the professor. From time to time, this syllabus may need to be amended for pedagogical reasons, and the instructor will notify students via announcements or email of any changes, additions, and/or deletions to the syllabus.