

PHYS 214-A General Physics Lab II

Class Meetings

Lab: Monday 2:00 PM - 04:20 PM, Hickman Science Center, Room 1409 (01/12-05/07/26)

Who will help you

Professor

Vola Andrianarijaona, PhD

Email: avola@southern.edu

Phone: 423-236-2915 (call between 9:00 am and 6:00 pm only, please)

Office: Hickman Science Center, Room 1111B

Office Hours:

Monday	9:00 am-2:00 pm
Tuesday	None
Wednesday	11:00-12:00
Thursday	9:00-11:00
Friday	10:00-12:00
Students, should you need help outside regularly scheduled office hours please contact me for an appointment.	

Other Helpers

eClass Help Desk: Help with eClass, Student Clickers, or Turnitin.

Email eclasshelp@southern.edu or call 423-236-2086

Information Technology Workstation Support: Desktop Computer Support.

Go to IT Workstation Support Desk in Wright Hall, or call 423-236-2712

McKee Research & Writing Center: The Writing Center, located on the 3rd floor of McKee Library, provides free writing support for all Southern students on all kinds of projects at any stage of the writing process. Schedule a 50-minute face-to-face or Zoom appointment at <https://trac.e.southern.edu> or use the QR code below. You can also call the Writing Center for assistance at 423.236.2014. All Writing Center appointments need to be scheduled (and canceled) at least 24 hours in advance. Hours: Sundays 12 pm-10 pm, Mondays-Thursdays 8 am-10 pm, Fridays 8 am-2 pm.



Lab Assistant(s): Katelyn Anderson, Angelina Castillo, Derek Renck, Richard Ramont.

What we will study

Course Description

Laboratory experience, coordinated with PHYS 212, is designed to develop conceptual understanding, experimental and analytical skills, and an understanding of the empirical basis of knowledge in physics. Beyond illustrating material in lecture, lab activities will help students learn to form quantitative conclusions from data as part of a systematic development of scientific curiosity, caution, and method. Prerequisite(s): PHYS 213 or PHYS 223. Pre- or Co-requisite: PHYS 212.

Textbook

“Wisdom is the principal thing; therefore, get wisdom” Prov. 4:7, by Andrianarijaona, KHPCContent, first edition, 2023 (with inclusive access only—go to your eClass).

Supplemental Materials

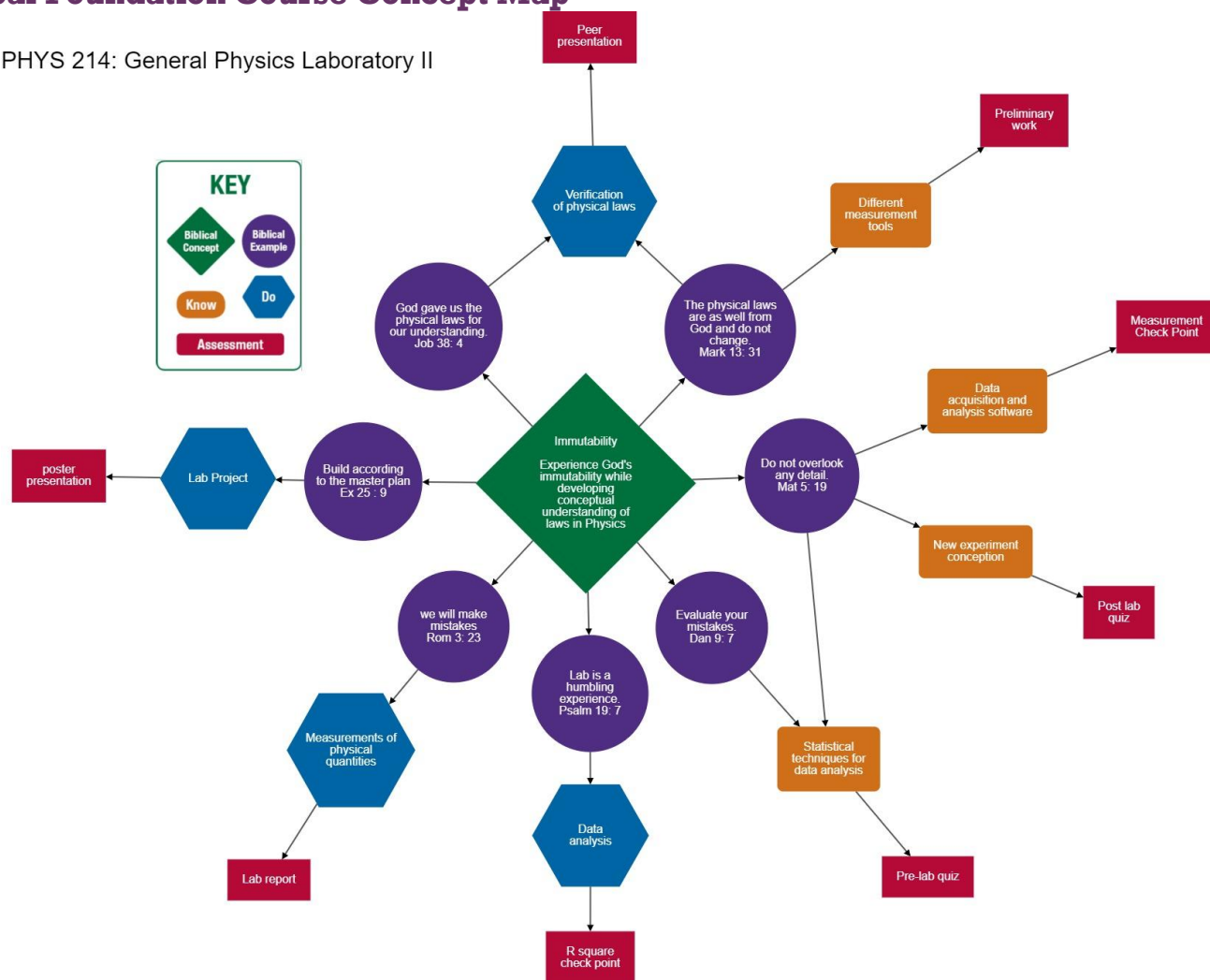
The laboratory guide sheets will be made available on eClass.

Biblical Foundation of the Course

God’s laws, which include the physical laws, are immutable. The laws and principles in physics bear God’s master mind and will not contradict nor conflict with His divine revelation.

Biblical Foundation Course Concept Map

PHYS 214: General Physics Laboratory II



Learning Outcomes

Upon successfully completing this course, the student will be able to:

1. display experimental skills encompassing the basic concepts of Geometric Optics, Physical Optics, Light and Quantum Mechanics, Electricity and Magnetism, and Exponential decay (radioactivity, etc.).
2. apply statistical analysis common to general experimental physics laboratory,
3. exhibit skills in making measurements of physical quantities with computerized equipment,
4. Students will apply the scientific process correctly and demonstrate an understanding of the concepts and limitations of natural science in classroom and laboratory experiences within a Seventh-day Adventist world view.

How we will study

Instructional Strategies/Methodologies during face-to-face only laboratory sessions

You will work by group of three or four per station. You are allowed to switch lab mates at the beginning of each single session (not during the session) but the lab mates should belong to the same section. Different groups are allowed to compare their results—I will be there to coach you. Discussion within and between groups are strongly encouraged to enhance collaborative learning. However, each student has to turn in all assignments listed down below as individual/personal work, the **video project and the face-to-face project presentation are the only group assignment**. A typical lab session comprises:

- a preliminary work described in the lab guide sheet, which should be done prior coming to the session and is due at the beginning of the lab.
- a brief introduction to the lab and a quick description of the different tools (given by a designated group) followed by an early Q&A session,
- a practice quiz on khpContent followed by timed pre-lab quiz,
- a long period of setting the lab, debugging materials, measuring, checking the measurements, recording data, analyzing data along with writing your lab report, etc.
- a practice quiz on khpContent followed by a timed post-lab quiz.
- Station cleaning before leaving. Before leaving, the group should clean up the station (may affect “participation” grade).

Beware that the preliminary works, pre-lab quizzes, and post-lab quizzes are in KHPcontent.com (online textbook). Use the code given to you for the inclusive access for yourself, not for any other.

Technology Use

Besides eClass, Panopto, and Internet based tools, you will also use PASCO software with interface 850, Excel, calculator, and hands-on equipment.

Statement about the use of Artificial Intelligence

As an institution committed to Christian values and the highest educational standards, Southern Adventist University urges faculty and students to prayerfully and critically evaluate how and when we use generative AI and other emergent technologies. Using AI tools can short-circuit critical thinking and impede learning goals. Further, because it is based on the accumulated work of others, it can also pose ethical problems and violate standards of academic integrity. For that reason, it is the policy of Southern Adventist

University that students use generative AI tools only after consultation with their instructor or when specifically invited to use it as part of an assignment. Inappropriate use may be penalized.

Classroom dress

We expect students and faculty to abide with Southern's Dress Code. Besides, all lab participants must wear closed toe shoes for safety reason.

Course Policies & Procedures - How to make the most of this class – Disabilities and Accommodations

In keeping with the University's policy, if you are a student who believes you may need an accommodation based on the impact of a disability or learning challenge, (*i.e. physical, learning, psychological, ADHD or other type*), you are strongly encouraged to contact Disability Support Services (DSS) at 423-236-2544 or stop by Lynn Wood Hall, Room 1082. Please note that accommodations are not retroactive and cannot be implemented until faculty or staff members have received the official Letter of Accommodation from DSS. Specific details of disabilities remain confidential between students and DSS unless a student chooses to disclose or there is legitimate academic need for disclosure, which is on a case-by-case basis. For further details, visit the Disability Support Services website at www.southern.edu/administration/student-success/disability.

Note: Students who request accommodations after the first day of the class might not complete the process in a timely manner. Legally, no retroactive accommodations can be provided.

Academic Honesty

Academic honesty is one of the important values that enable us to function as a university. The spirit of honest inquiry requires that students and faculty members properly cite the sources used in studies and writing. It is important for us to be able to trust each other as we learn from each other's presentations, written work, and visual communication in order to keep the teaching/learning enterprise functioning well.

Academic honesty is even more critical at a university that offers a Christian education. Respect for other individuals' work means that we will give them proper credit for their thoughts and expressions whenever used as a resource for our own projects and communications.

Any form of academic dishonesty, cheating, and plagiarism, including but not limited to presenting someone else's work as your own, using lab reports or quizzes from previous year, fabrication, multiple submissions, result falsification, deception, misrepresentation, production of materials for other current or future students, will have consequences ranging from a zero on the assignment to a failing grade. A second offense and any serious offense will be discussed with the Department Chair and may result to an expulsion.

Absences and Make-Up Work

Absence related to school sanction due to violations of SAU principles will be treated an excused absence.

Please do not come to lab sick and please notify the professor, preferably by email. If you have a legitimate absence, you will be allowed to either let that lab be your dropped lab or schedule for a make-up lab.

Course Evaluation

Near the end of the semester, you will need to evaluate this course. Southern Adventist University requires all students enrolled in courses, on campus or online, which enroll more than 5 students, to complete course evaluations as part of the ongoing process of improving course delivery and academic standards.

You may access this evaluation at <http://myaccess.southern.edu>. Log in using your SAU e-mail name and password, and then select Course Evaluation. All comments and evaluations are completely anonymous and the results of these course evaluations are made available to professors only after grades are submitted to the records office.

Disclaimer

As professor, I reserve the right to modify, supplement, and make changes to the course syllabus as needs arise. Students will be notified in writing if/when any changes are made.

Feedback Plan

- Preliminary work, pre-lab quiz, and post-lab quiz will have in class subsequent feedback.
- The lab report (**submission in eClass only**) is due at 11:00 pm on the Sunday of the week.
- The grades for preliminary works will be submitted in eClass.
- Lab report grades will be submitted a week later on Sunday evening.

Assessment Plan

See chart below for grading scale and policy. There is no final exam for this class.

- They are due at the beginning of class and submitted in khpcontent.com.
- The assessment of the group project consists of 10-minute presentation in class on 04/27/26 and a 10-minute video due on 05/04/26 (11:59 pm). More information will be given in class.
- 10% will be deleted for each period that the lab write-up is late. A zero will be recorded for each activity not checked off by the last Friday of the semester.

Grading Scale			
The following Grading Scale will be used:			
A	93-100%	C	72-78%
A-	90-93%	C-	70-72%
B+	88-90%	D+	68-70%
B	82-88%	D	62-68%
B-	80-82%	D-	60-62%
C+	78-80%	F	60% & below

Category	Weight
Attendance & Participation	10%
Preliminary work	5%
Pre-lab quiz	5%
Post-lab quiz	10%
Lab report	50%
Group Project & Presentation	20%
Total	100%

The lab report will be assessed and graded according to the procedure below (same as Fall semester):

The way you ORGANIZE your report, the report's NEATNESS and CONCISENESS will greatly affect your lab report grades.

Start with your names and your lab partner's names, then the title of the lab. Then, follow the proposed guideline below:

1.OVERARCHING GOAL

2. THEORY
3. APPARATUS
4. PURPOSE of each activity
5. METHOD
6. DATA (usually in Excel): State the independent, dependent, and control variables (and hypothesis), then continue with the information measured or given:
 - a. Clearly organized using table, lists, etc.
 - b. All data should be clearly labeled in words not abbrev.
 - c. All relevant data should be included
 - d. Do not forget the units.
7. CALCULATIONS (usually in Excel)—manipulation of data to obtain results (graphs and vector drawings fall under this category)
8. RESULTS (Report this in the Lab report)—the product of your calculations
 - a. Final result(s) with their appropriate units for each activity.
 - b. Absolute and/or percent errors/differences with the appropriate units.
9. CONCLUSION & QUESTIONS
 - a. Report again the results and discuss whether the goal is achieved or not.
 - b. Sources of Error, etc.
 - c. Answer the questions in the lab guide sheet as separate items from the conclusion. You should use bullet points (1. ...; 2. ...; etc.)
10. ABOVE AND BEYOND

AVOID copying someone else's file, especially Excel files. Type in and do all the work yourself even if the data are the same. And do not share your files to any others. These are by definition plagiarism and will be sanctioned accordingly.

Tentative Course Schedule/Calendar

For each session, the lab assignment is described in the lab guide sheet (see khp.com). See above to find out what assignments to prepare for each week. The weeks of April are for the project and make-up labs. The project will be presented to the class on April 27, 2026. The corresponding video should be submitted in eClass by 05/04/26 at 11:59 pm.

Rubrics for the regular labs (see next page)

Lab 2 nd semest	4	5	6	7	8	9	10	11	12		14	15
Title	Underst anding diffracti on grating	Geom etric Optics I: reflecti on and refracti on	Geom etric Optics II: focal length, real & virtual image	Hum an eye, a biop hysic s labor atory	Electr ic field and equip otenti al Lab	Ohm' s law	Kirch hoff's rules	RC time const ant	Axon model, A Biophysic s Laborator y		Balmer Series and Rydberg constant	Expon ential growth and decay
Prelimi nary work (open date)	01/10 7:00 am	01/17 7:00 am	01/24 7:00 am	01/30 7:00 am	02/07 7:00 am	02/14 7:00 am	02/21 7:00 am	02/27 7:00 am	03/07 7:00 am		03/21 7:00 am	03/28 7:00 am
Prelimi nary work (due date)	01/12 2:00 pm	01/19 2:00 pm	01/26 2:00 pm	02/02 2:00 pm	02/09 2:00 pm	02/16 2:00 pm	02/23 2:00 pm	03/02 2:00 pm	03/09 2:00 pm		03/23 2:00 pm	03/30 2:00 pm
Pre- lab (open at)	01/12 2:30 pm	01/19 2:30 pm	01/26 2:30 pm	02/02 2:30 pm	02/09 2:30 pm	02/16 2:30 pm	02/23 2:30 pm	03/02 2:30 pm	03/09 2:30 pm		03/23 2:30 pm	03/30 2:30 pm
Pre- lab (close at)	01/12 3:00 pm	01/19 3:00 pm	01/26 3:00 pm	02/02 3:00 pm	02/09 3:00 pm	02/16 3:00 pm	02/23 3:00 pm	03/02 3:00 pm	03/09 3:00 pm		03/23 3:00 pm	03/30 3:00 pm
Post- Lab (open at)	01/12 3:50 pm	01/19 3:50 pm	01/26 3:50 pm	02/02 3:50 pm	02/09 3:50 pm	02/16 3:50 pm	02/23 3:50 pm	03/02 3:50 pm	03/09 3:50 pm		03/23 3:50 pm	03/30 3:50 pm
Post- Lab (close at)	01/12 4:20 pm	01/19 4:20 pm	01/26 4:20 pm	02/02 4:20 pm	02/09 4:20 pm	02/16 4:20 pm	02/23 4:20 pm	03/02 4:20 pm	03/09 4:20 pm		03/23 4:20 pm	03/30 4:20 pm