FLORIDA GULF COAST UNIVERSITY

COLLEGE of ARTS and SCIENCES

Department of Chemistry and Physics

Instructor: Derrick E. Boucher, Ph.D.
Semester: Fall 2016
Class Meetings: T,R 11:30am – 1:15pm
Seidler 220
Lab Meetings: T 1:30 – 3:10pm (CRN 81705)
(Griffin267) **R 1:30 – 3:10pm (CRN 81706)**

Phone Number: (239) 590-7170
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Office Location: Whitaker 255

Office Hours: T,R 10:30-11:20 am
Other times by appointment (esp. Wed. 1:30-4pm)

1. COURSE NUMBER AND TITLE, CATALOG DESCRIPTION, CREDITS, CRN:

PHY 2049 GENERAL PHYSICS II WITH LAB (4 CREDITS), CRNs 81705, 81706
Second semester of a calculus-based two semester sequence of general physics (mechanics, wave motion, sound, thermodynamics, geometrical and physical optics, electricity and magnetism) and laboratory for science, mathematics, and engineering students.

2. PREREQUISITES FOR THIS COURSE:

MAC 2312 for level UG with min. grade of C and PHY 2048C for level UG with min. grade of C

3. GENERAL COURSE INFORMATION: Topic Outline.

- Electric field of discrete and continuous charge distributions
- Electric potential
- Electrostatic energy and capacitance
- Electric current and direct-current circuits
- The magnetic field and sources of the magnetic field
- Magnetic induction
- Alternating-current circuits
- Maxwell's equations and electromagnetic waves
- Properties of light, optical images, interference and diffraction

4. LEARNING OUTCOMES AND ASSESSMENT:

GENERAL EDUCATION COMPETENCIES:

General education courses must meet all of the following outcomes.

Quantitative Reasoning (QR): Analyze, summarize, and interpret quantitative data. Make valid inferences.

Written Communication (WC): To communicate effectively using standard English language.

Critical Thinking (CT): To demonstrate skills necessary for analysis, synthesis, and evaluation.

ADDITIONAL COURSE COMPETENCIES:

At the conclusion of this course, students will be able to demonstrate the following additional competencies:

- Recognize the quantum nature of electric charge.
- Explain the interaction between electric charges and use Coulomb's law to solve problems involving charge distributions.
- Explain the concept of "field" and compare it to "action-at-a-distance" using forces.
- Explain and draw the electric field configuration due to various discrete and continuous charge distributions.
- Relate the theoretical interpretation of electric potential to everyday phenomena and use it to solve problems.
- Explain the meaning of electrostatic energy and apply it to solve problems involving capacitance.
- Identify the theoretical framework for electric current and apply it to solving problems on direct current circuits and alternating current circuits.
- Explain and draw the magnetic field configuration due to various current distributions.
- Explain the concept of electromagnetic induction and use it to explain everyday physical phenomena.
- Describe and use Maxwell's equations to solve problems in electricity and magnetism.
- Investigate the interaction of light with matter and light's properties.

5. COLLEGE-WIDE POLICIES:

Academic Behavior Standards and Academic Dishonesty

All students are expected to demonstrate honesty in their academic pursuits. The university policies regarding issues of honesty can be found under the "Student Code of Conduct" and under "Policies and Procedures" of the Student Guidebook . All students are expected to study this document which outlines their responsibilities and consequences for violations of the policy. The FGCU Student Guidebook is available online at http://studentservices.fgcu.edu/StudentConduct/guidebook.html. Students agree that by taking this course all required papers may be subject to submission for textual similarity review to Turnitin.com for the detection of plagiarism. All submitted papers will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin.com service is subject to the Terms and Conditions of Use posted on the Turnitin.com site. **Any misbehaviors and or misconducts will be promptly reported to the Dean of Students.**

My policy for exams: cheating on an exam (using sources of information other than the supplied equation sheet or copying from another student's work) **will result in a failure for the course.**

Disability Accommodations Services

Florida Gulf Coast University, in accordance with the Americans with Disabilities Act and the university's guiding principles, will provide classroom and academic accommodations to students with documented disabilities. If you need to request an accommodation in this class due to a disability, or you suspect that your academic performance is affected by a disability, please contact the Office of Adaptive Services http://www.fgcu.edu/adaptive/.

The Office of Adaptive Services is located in Howard Hall 137. The phone number is 590-7956 or TTY 590-7930, e-mail adaptive@fgcu.edu. I am very willing to accommodate any requests, but I require that any requests be made at least a week in advance so that I can properly prepare the accommodation.

Student Observance of Religious Holidays

All students at Florida Gulf Coast University have a right to expect that the University will reasonably accommodate their religious observances, practices, and beliefs. Students, upon prior notification to their instructors, shall be excused from class or other scheduled academic activity to observe a religious holy day of their faith. Students shall be permitted a reasonable amount of time to make up the material or activities covered in their absence. Students shall not be penalized due to absence from class or other scheduled academic activity because of religious observances. Where practicable, major examinations, major assignments, and University ceremonies will not be scheduled on a major religious holy day. A student who is to be excused from class for a religious observance is not required to provide a second party certification of the reason for the absence.

6. Specifics for Dr. Boucher's Physics 2049 course:

Instructor: Dr. Derrick E. Boucher, Associate Professor of Physics

(239) 590-7170, Whitaker 255, dboucher@fgcu.edu

Course Schedule: Details below.

Text: Physics for Scientists and Engineers with Modern, Hybrid (with Enhanced WebAssign Homework and eBook LOE Printed Access Card for Multi Term Math and Science) 8th Edition

Author: Raymond A. Serway, John W. Jewett, published by Cengage (Brooks/Cole),

ISBN: 113310360X ISBN13: 9781133103608

If you purchase Webassign separately (see below) then any version of the 8th edition will be fine. (An online text is included in Webassign, so you may not even want to purchase a paper book.)

Calculator: You should have at your disposal a scientific calculator. Required functions are; $\sqrt{x}$, x^2, log, natural log, e^x, sin, cos, tan, y^x. If do you not already own one, expect to pay $1 to $200, depending on how fancy you want to get. Oh, and once you've spent the buck(s), bring it to class!

Websites:

Canvas: We will use Canvas for grade records, document storage (including this syllabus), some lab report submissions (paper copies will usually be required) and discussions to be visited between class periods.

Webassign : https://www.webassign.net/login.html

Course name : **PHY 2049C, section 81705 and 81706**
Course key : **fgcu 1253 4794**

Webassign is an online homework site that I will use exclusively for graded homework. A subscription to this site is included with the purchase of a new Hybrid textbook. If you are borrowing someone's text or purchased a different version you may have to purchase a subscription separately. An electronic book is accessible online through WebAssign, so you may decide to not purchase a paper text altogether.

I will use this for course credit, so make sure you purchase a subscription. A free trial period is available to get you started right away.

Communication: When I use email to contact you or the class as a whole, I will use ONLY your FGCU email address or whatever address is given on Gulfline. Check this email regularly. I will generally respond more slowly to messages in Canvas or Webassign, thought I might think to check these, too.

Grading: Your final grade will be comprised of the following:

Area	Grade
Laboratory	**17%**
Homework	**21%**
3 in class exams	**45%**
Final Exam	**15%**
Quizzes	**2%**

The overall grading scale will be as follows:

Total Score [%]	Grade
88.0 - 100.0	**A**
84.0 - 87.9	**A-**
80.0 - 83.9	**B+**
76.0 - 79.9	**B**
72.0 - 75.9	**B-**
68.0 - 71.9	**C+**
64.0 - 67.9	**C**
60.0 - 63.9	**C-**
55.0 - 59.9	**D**
Below 54.9	**F**

Note: For a required course in your major, a C- is an unacceptable grade.

I will not try to quantify the important element of classroom participation, but it can be very important in cases where a student's final grade is "borderline" between two letter grades. Not only does classroom participation (i.e. **ASKING QUESTIONS**) help you, but it may bring to my attention a point which may need to be reviewed, which may help the other students as well. **Please, don't hesitate to ask questions at anytime**.

Laboratory

The laboratory is an integral part of this class. Failure to complete and hand in all laboratory assignments will result in an automatic **F** for the course. The laboratory will contribute 17% to your final grade, and **you must pass the laboratory to pass the class!** Do not be late for the lab sessions. If you are late, your lab report grade will be reduced by 10 points. You are not allowed to submit your lab report if you are late more than 30 minutes. Word- processed Laboratory Reports have to be submitted to the Canvas site (an electronic file) and to your lab instructor (a hard copy) at the time specified in the syllabus. You must hand in **both copies** on time. They must be the same one. If you submit one version to Canvas and give your instructor a different version, you receive **zero points**. **Hand-written Lab Reports will not be accepted (except for equations or diagrams)!** If you hand in your Lab Report late, there will be an automatic **deduction of 10 points** (out of a maximum of 100 points) for every day (including weekends). Do not miss any lab sessions. You can make up only one lab later on. You will receive **an F grade** if you miss **two or more lab sessions**.

Exams:

The exams will be composed primarily of problems which must be solved. Problem solving is a skill. Like riding a bicycle or cat juggling, it must be practiced. Therefore, the homework is an essential part of your test preparation. You cannot "cram" for a physics test. Practice early and practice often. The exam dates are given in the course schedule.

Everyone can have a bad day, and this can happen on an exam day. If you "bomb" a test there is still hope. If you score a higher percentage of the points on the final exam than your lowest test score, the final exam percentage will replace your lowest test score. (e.g. if your lowest test is 45% and you score an 81% on the final exam, your 45% score will be replaced by 81%.) If you miss an exam, you will be given a zero grade for that exam. (Thus, making it, you and I both hope, your lowest exam.) Make-up exams will be given only in situations where a student has already missed an exam and must miss another due to some grave reason, or due to some unavoidable conflict about which ***I am notified in advance.***

Yes, the final exam is comprehensive and mandatory. Yes, really!

Quizzes:

The quizzes are based upon recent homework and reading. They may be **unannounced** and will be given during class. I plan on having about N=8 quizzes, each of which will take about 5-10 minutes of class time. Your highest N-1 quiz grades will be added to your homework grade as equivalent to roughly a single homework assignment. Missed quizzes will be counted as zeroes.

Tentative Schedule for Fall 2016

Items below may change. Any changes will be announced in class and on Canvas. The weeks are blocked in alternating color. The Tuesday and Thursday labs do the same lab in the same week.

Date T=Tues R = Thurs	**Reading, Topics Covered**	**Assignments Due**	**Comments**
August R 18 Session 1	*Electric Fields*, Chapter 23	Math and Concept Review due Tuesday	The Math and Concept Review on Webassign is a very good refresher.
Lab		No meeting	Review Canvas content on labs (Lab Resources)
T 23 Session 2	*Gauss's Law*, Chapter 24		

Date T=Tues R = Thurs	**Reading, Topics Covered**	**Assignments Due**	**Comments**
R 25 Session 3	*Electric Potential*, Chapter 25	HW 1 due Fri. 8/26	
Lab Session 1	Lab 1: Electric Field		Bring graph paper! (File on Canvas)
T 30 Session 4	*Capacitance and Dielectrics*, Chapter 26	HW 2 due Tu. 8/30	
September R 1 Session 5	*Current and Resistance*, Chapter 27	HW 3 due Fri. 9/2	
Lab Session 2	Lab 2: Capacitance	Lab 1	
T 6 Session 6	Electricity problem solving	HW 4 Due Tu. 9/6	Bring any questions you have on recent homeworks!
R 8 Session 7	Exam 1 review	HW 5 due Mon. 9/12	Exam 1 will cover Chapters 23 - 27
Lab Session 3	Lab 3: Resistance and Resistivity	Lab 2 Report	
T 13 Session 8	**Exam 1**		Don't forget to bring your own calculator! Equation sheets will be provided.
R 15 Session 9	*Direct-Current Circuits*, Chapter 28		
Lab Session 4	Lab 4: RC Circuits,	Lab 3 Report	
T 20 Session 10	Ch. 28, cont.		

Date T=Tues R = Thurs	**Reading, Topics Covered**	**Assignments Due**	**Comments**
R 22 Session 11	*Magnetic Fields*, Chapter 29	HW 6, ch 28 due Thu. 9/22	
Lab Session 5	Lab 5: Multiloop Circuits	Lab 4 Report	Begin lab 5 this week: takes two weeks
T 27 Session 12	Ch. 29 cont.	HW 7, ch 29 due Wed 9/28	
R 29 Session 13	*Sources of the Magnetic Field*, Chapter 30		
Lab Session 6	Lab 5, cont.	No lab report due	
October T 4 Session 14	*Faraday's Law*, Chapter 31	HW 8, ch 30 due Thu. 10/6	
R 6 Session 15	Ch. 31 cont.	HW 9, ch 31 due Tue. 10/11	
Lab Session 7	Lab 6: Magnetic Field	Lab 5 Report	
T 11 Session 16	Exam 2 review		Have questions ready! Exam 2 will cover Chapters 28 – 31
R 13 Session 17	**Exam 2**		Don't forget your calculator!
Lab Session 8	Lab 7 Faraday's Law	Lab 6 Report	
T 18 Session 18	*Electromagnetic Waves*, Chapter 34		

Date T=Tues R = Thurs	**Reading, Topics Covered**	**Assignments Due**	**Comments**
R 20 Session 19	*Wave Motion*, Chapter 16	HW 10, ch. 34 due Fri. 10/21	
Lab Session 9	Lab 8, Snell's Law	Lab 7 Report	
T 25 Session 20	Ch. 16 cont. Begin Ch17, Sound Waves		
R 27 Session 21	Chapter 17, cont.	HW 11, ch 16 due Fri 10/28	
Lab Session 10	Lab 9, Speed of Sound	Lab 8 Report	
November T 1 Session 22	*Superposition and Standing Waves*, Chapter 18	HW 12, ch 17 due Wed 11/2	Tues. Nov. 1 is the last day to withdraw from classes without academic penalty
R 3 Session 23	Exam 3 review	HW 13, ch 18 due Mon 11/7	Exam 3 will cover Chapters 34, 16 - 18
Lab Session 11	Lab 10, Thin Lenses	Lab 9 Report	
T 8 Session 24	**Exam 3**		Don't forget your calculator!
R 10 Session 25	*The Nature of Light and the Principles of Ray Optics*, Chapter 35		
Lab Session 12	Problem-solving	No Report Due	All students are welcome to either problem-solving session. Come with questions.
T 15 Session 26	*Image Formation*, Chapter 36	HW 14, ch 35 due Tue 11/15	

Date T=Tues R = Thurs	**Reading, Topics Covered**	**Assignments Due**	**Comments**
R 17 Session 27	*Wave Optics*, Chapter 37		
Lab Session 13	Lab 11, Diffraction Grating	Lab 10 Report	
T 22 Session 28	*Diffraction Patterns and Polarization*, Chapter 38	HW 15 ch. 36 due Tue. 11/22	
R 24	NO CLASS	NO CLASS	THANKSGIVING BREAK!
Lab	No Lab	No Lab	THANKSGIVING BREAK!
T 29 Session 29	Chap. 38, cont.	HW 16, ch. 37 due 12/1	Final exam is cumulative but is weighted ~40% new material since Exam 3.
December R 1 Session 30	Course wrap-up	HW 17 due Wed. 12/7	
Lab Session 14	Make-up lab opportunity	Lab 10 Report (can hand in in lecture if you are not doing the make-up lab)	Students who are eligible for a **make-up lab** will complete a make-up lab during these sessions.
Thursday, 12/8 **10:00 AM – 12:15 PM**	**FINAL EXAM**	**10:00am – 12:15pm** **Seidler 220**	Don't forget your calculator! **Make-up lab reports are due at this time.**