

FLORIDA GULF COAST UNIVERSITY

COLLEGE of ARTS and SCIENCES

Department of Chemistry and Physics

Instructor: Derrick E. Boucher

Semester: SPRING 2015

Class Meetings: MWF 2:00 pm – 3:15 am

Lab Meetings: M or W 12:00 pm - 1:45 pm, BHG 267

Lab Instructor: Richard Panek rpanek@fgcu.edu

Phone Number: (239) 590-7170

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Office Location: WH 255

Office Hours: MW 10:00 am – 10:30 am

MWF 1:00 pm – 1:30 pm

F 8:00 am – 10:30 am

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

PHY 2048C GENERAL PHYSICS I WITH LAB (4 CREDITS) CRN 10981/10985

Students study the nature of the physical world. Principles of classical mechanics, introduction to wave theory, heat and elementary thermodynamics are investigated. The curriculum is inquiry based and fully integrated with laboratory and/or field experiences which emphasize active learning strategies.

2. PREREQUISITES FOR THIS COURSE:

MAC 1147 for level UG with min. grade of C or MAC 2311 for level UG with min. grade of C

3. GENERAL COURSE INFORMATION: Topic Outline.

- Systems of measurement, units, and dimensional analysis
- Motion in one, two, and three dimensions
- Newton's Laws and their applications
- Work, energy, and conservation of energy
- Systems of particles, collisions, center of mass, and conservation of linear momentum
- Rotational motion and centripetal acceleration
- Conservation of angular momentum
- Gravity
- Static and rotational equilibrium, elasticity
- Fluids, Archimedes' principle
- Oscillations and waves
- Temperature and the kinetic theory of gases
- Heat and thermodynamics

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:

- Examine the principle of dimensional analysis and use it to derive approximate expressions of physical laws.
- Identify the SI system of units and analyze the differences between base and derived units.
- Interpret the laws of motion and apply them to solve problems in one and two dimensions.
- Differentiate between and among the concepts of work, power, energy, and conservation of energy; examine the applications of these concepts, and use them to interpret and explain natural phenomena.
- Recognize the concept of center of mass and use it to analyze the motion of a system of particles.
- Describe the concept of conservation of momentum, examine its applications, and use it to interpret and explain natural phenomena.
- Apply the concepts of momentum and energy to explain collisions.
- Describe the concept of circular motion and use it to solve problems.
- Use the laws of rotational kinematics to compare linear motion with rotational motion.
- Explain the law of gravitation as it relates to natural phenomena; combine this law with the laws of motion to explain planetary orbits.
- Analyze the conditions for static and rotational equilibrium and use the concept of torque to explain natural phenomena.
- Describe the concepts related to fluid pressure and buoyancy.
- Explain the properties of oscillations, waves and the Doppler effect; apply these concepts to natural phenomena.
- Use the kinetic theory of gases to distinguish between “heat” and “temperature”; interpret and apply the concept of energy per degree of freedom.
- Interpret and apply the laws of thermodynamics to explain natural phenomena.
- Recognize thermal properties and processes and use them to explain and interpret thermal phenomena.

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.**

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. REQUIREMENTS FOR THE STUDENTS:

Computers: You are not allowed to bring any computers during exams (laptop, notebook, etc.) to the class. In case of violation, you will be asked to leave. Report will be sent to the Dean of Students office. Computers are allowed in lecture or laboratory as long as their use is restricted to course-related activities.

Cell Phones: You must turn off your cell phones before coming to the class. No talk and no text are allowed during the class. In case of violation, you will be asked to leave. Report will be sent to the Dean of Students office. If you must take an important call, set your phone to a silent mode and quietly leave the classroom to answer the call or text.

Reading the Textbook:

During the lecture part of our class meetings we will discuss the main concepts covered in your course textbook. It is very important that you read the assigned chapters in the textbook **before** you come to the class. Please, do not expect me to just read the textbook for you! The course textbook is a good one, written by a physics professor who knows his physics *and* teaching physics. Only by actually doing reading and any assignments I give will you be prepared to learn during the next class. If you do not prepare, you will be lost and frustrated during class.

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. You must hand in **lab report** on time. **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 **more than two lab sessions**. Please see Canvas for a document describing Dr. Panek's policies and guidelines for your lab reports.

Homework:

The purposes of the homework are so that you can gain some practice solving problems, and so that I may assess your grasp of the material before you are tested on it. We will use the LON-CAPA website for most homework. The online homework assignments will be frequent. "Copying" homework from a friend or working with them online may result in a higher homework grade for you, but it almost guarantees lower test scores. The online homework will only be available for a limited time, so plan your time carefully when the assignments are announced. I will occasionally assign problems to be handed in on good old-fashioned paper, too.

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.

For all quizzes and exams, relevant "equation sheets" will be provided. The memorization of formulas is less important than knowing *when and how to use* the formulas. I will provide you with pdf files of these equation sheets for studying. Thus, you should become familiar with the equation sheets and use them when doing your homework.

7. ATTENDANCE POLICY:

I suggest very strongly that you attend every class. Missing class will have a significant negative impact upon your understanding of the material and consequently your grade. Solutions to most typical or difficult problems will be covered in lecture sections. In general, students who attend lectures will be far better prepared for the course examinations.

8. GRADING POLICY:

Your final grade will be comprised of the following

Area	Grade
Laboratory	17%
Homework	20%
In-class quizzes	3%
4 in class exams	40%
Final Exam	20%

The overall grading scale will be as follows:

Total Score [%]	Grade
88.0 - 100.0	A
84.0 - 87.99	A-
80.0 - 83.99	B+
76.0 - 79.99	B
72.0 - 75.99	B-
68.0 - 71.99	C+
64.0 - 67.99	C
60.0 - 63.99	C-
55.0 - 59.99	D
Below 54.99	F

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

9. **REQUIRED COURSE MATERIALS:**

Text: *Physics for Scientists and Engineers with Modern Physics, Hybrid (with Enhanced WebAssign Homework and eBook LOE Printed Access Card for Multi Term Math and Science), 9th Edition*

ISBN10: 1-305-08633-3 ISBN13: 978-1-305-08633-3

You can use either hard copy or e-text book. (See Webassign information below.)

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, \sin^{-1} , \cos^{-1} , \tan^{-1} , y^x . If do you not already own one, expect to pay \$5 to \$200, depending on how fancy you want to get.

10. **WEB LINKS:**

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

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

Course name : **PHY 2048 CRNs 10981, 10985, section 10981, 10985**

Course key : **fgcu 8161 2181**

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 enhanced 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.

11. **CLASS SCHEDULE:**

Items below in the lecture or lab schedules may change. Any changes will be announced in class and on Canvas.

Lecture Schedule Spring 2015

Date	Reading, Topics Covered	Due	Comments
January M 5 Session 1	<i>Introduction</i> , Chapter 1, Physics and Measurement		Review course policies WebAssign overview

Date	Reading, Topics Covered	Due	Comments
W 7 Session 2	Ch. 2, Motion in One Dimension		
F 9 Session 3	Ch 2, cont.		
M 12 Session 4	Ch. 3, Vectors	HW 1, ch 1 due Mon 1/12	
W 14 Session 5	Ch 3, cont.	HW 2, ch 2 due Wed 1/14	
F 16 Session 6	Ch. 4 Motion in 2-d		
M 19	MLK Day	No Classes	
W 21 Session 7	Ch. 4 cont.	HW 3, ch 3 due Wed 1/21	
F 23 Session 8	Wrap-up, review for exam 1	HW 4, ch 4 due Sun. 1/25	Exam 1 will cover chapters 1-4
M 26 Session 9	***** Exam 1 *****		Don't forget to bring your own calculator!
W 28 Session 10	Ch. 5, Newton's Laws		
F 30 Session 11	Ch.5 cont.		
February M 2 Session 12	Ch. 5 cont.		
W 4 Session 13	Ch. 6, Circular Motion and Other Applications of Newton's Laws		
F 6 Session 14	Ch. 6, cont.	HW 5, ch 5 due Sun. 2/8	
M 9 Session 15	Ch. 6, cont.		
W 11 Session 16	Ch. 7, Energy of a System	HW 6, ch 6 due Wed. 2/11	
F 13 Session 17	Ch. 7, cont.		
M 16 Session 18	Ch. 7, cont.		
W 18 Session 19	Wrap-up, review for exam 2	HW 7, ch7 due Thu. 2/19	Exam 2 will cover Chapters 5-7
F 20 Session 20	***** Exam 2 *****		Don't forget to bring your own calculator!

Date	Reading, Topics Covered	Due	Comments
M 23 Session 21	Ch. 8, Conservation of Energy		
W 25 Session 22	Ch. 8, cont.		
F 27 Session 23	Ch. 8 cont, Ch. 9 Linear Momentum and Collisions		
March M 2	No classes, spring break		
W 4	No classes, spring break		
F 6	No classes, spring break		
M 9 Session 24	Ch. 9, cont	HW 8, ch. 8, due Mon 3/9	
W 11 Session 25	Ch. 9, cont, Ch. 10, Rotation of Rigid Objects		
F 13 Session 26	Ch. 10, cont.	HW9, ch9, due Sun. 2/12	
M 16 Session 27	Wrap-up, review for exam 3	HW 10, ch. 10 due Sun. 3/15	Exam 2 will cover Chapters 8-10
W 18 Session 28	***** Exam 3 *****		Don't forget to bring your own calculator!
F 20 Session 29	Ch 11, Angular momentum		
M 23 Session 30	Ch. 11, cont.		
W 25 Session 31	Ch. 12, Static Equilibrium and Elasticity	HW11, ch. 11 due Wed. 3/25	Friday March 27 is the last day to withdraw from classes without academic penalty.
F 27 Session 32	Ch. 12, cont.		
M 30 Session 33	Ch. 12, cont., Ch. 13, Gravitation		
April W 1 Session 34	Ch. 13, cont.	HW12, ch. 12 due Wed. 4/1	Exam 3 will cover Chapters 11-13
F 3 Session 35	***** Exam 3 *****	HW 13, Ch. 13 due Thu. 4/2	Don't forget your calculator!
M 6 Session 36	Ch. 14, Fluid Mechanics		Chapters 14-15, 19-22 will be new material on the final exam.
W 8 Session 37	Ch. 14, cont, Ch. 15, Oscillatory Motion		About 40% the final will consist of new material, 60% cumulative.

Date	Reading, Topics Covered	Due	Comments
F 10 Session 38	Ch. 15, cont. , Ch. 19, Temperature	HW 14, Ch. 14 due Fri 4/10	
M 13 Session 39	Ch. 20, 1 st Law of Thermodynamics	HW 15, Ch. 15 due Tue 4/12	
W 15 Session 40	Ch. 20, cont.	HW 16, Ch. 19 due Wed 4/15	
F 17 Session 41	Ch. 21, Kinetic Theory of Gases	HW 17, Ch. 20 due Fri 4/17	
M 20 Session 42	Ch. 21, cont.		
W 22 Session 43	Ch. 22, 2 nd Law and Heat Engines		
F 24 Session 44	Ch. 22, cont.	HW 18, Ch. 21 due Fri 4/24	
M 27 Session 45	Wrap-up and review	HW 19, Ch. 22 due Fri 5/1	Last Day of Classes
Sat. May 2 12:30 PM - 2:45 PM	FINAL EXAM for both CRNs	AB7 room 220	Don't forget your calculator!

LAB SCHEDULE

Dr. Boucher, Spring 2015

General Physics Monday = CRN 10981 Wednesday = CRN 10985 12:00 – 1:45 Richard Panek teaches lab

Date	Laboratory activity	Report Due: printed copy AND one submitted to Canvas
January M 5	<i>1st meeting, orientation, attendance</i>	
W 7	<i>1st meeting, orientation, attendance</i>	
M 12	Lab 1, Graphical Representation of motion	
W 14	Lab 1, Graphical Representation of motion	
M 19	MLK Day	

Date	Laboratory activity	Report Due: printed copy AND one submitted to Canvas
W 21	No lab	Lab 1, both sections, may be handed in in lecture
M 26	Lab 2, Freefall	
W 28	Lab 2, Freefall	
February M 2	Lab 3, Projectile Motion	Lab 2
W 4	Lab 3, Projectile Motion	Lab 2
M 9	Lab 4, Equilibrium of Forces	Lab 3
W 11	Lab 4, Equilibrium of Forces	Lab 3
M 16	Lab 5, Constant Acceleration	Lab 4
W 18	Lab 5, Constant Acceleration	Lab 4
M 23	Lab 6, Centripetal Force	Lab 5
W 25	Lab 6, Centripetal Force	Lab 5
March M 2	No lab Spring Break	
W 4	No lab Spring Break	
M 9	Lab 7, Momentum Conservation	Lab 6
W 11	Lab 7, Momentum Conservation	Lab 6
M 16	Lab 8, Torque and equilibrium	Lab 7
W 18	Lab 8, Torque and equilibrium	Lab 7
M 23	Lab 9, Buoyancy	Lab 8
W 25	Lab 9, Buoyancy	Lab 8
M 30	Lab 10, Specific Heat	Lab 9

Date	Laboratory activity	Report Due: printed copy AND one submitted to Canvas
April W 1	Lab 10, Specific Heat	Lab 9
M 6	Lab 11, Mass on a Spring	Lab 10
W 8	Lab 11, Mass on a Spring	Lab 10
M 13	Lab 12, Resonance in Air	Lab 11
W 15	Lab 12, Resonance in Air	Lab 11
M 20	Make-up Lab*	Lab 12
W 22	Make-up Lab*	Lab 12
M 27	No lab	Last class day

* Only students who have missed a lab session during the rest of the semester are allowed to perform the make-up lab.

12. ANY OTHER INFORMATION OR CLASS PROCEDURES OR POLICIES:

Center for Academic Achievement Syllabus Statement:

The Center for Academic Achievement (CAA) offers academic support services for any FGCU student. The services are at no extra charge to students and include: peer tutoring, Supplemental Instruction, Student Success Workshops, and individualized academic coaching. If you would like to participate in or learn more about these services, please visit the CAA in Library 103. You may also email the CAA at caa@fgcu.edu or call at (239) 590-7906. The CAA website is www.fgcu.edu/caa.