



Syllabus V 1.2
PHY 2054C Section 0001
Physics 2, Spring 2016
Tuesday, Thursday 1:30 - 2:50 p.m., MSB 260

Professor: Dr. Josh Colwell
Office: Physical Sciences Building 434
Contact info: E-mail: josh@ucf.edu (this is by far the easiest way to contact me.)
Telephone: 407-823-2012
Telephone for in-class texting: 480-382-3749 (4803-UCF-PHY)
AIM ID (AIM, ichat, etc): colwellastronomy. Twitter: @colwellucf
In person office hours: Monday 10:30 - 11:30 a.m., Tuesday 3:30-4:45 p.m., Friday 11:00 a.m. - 12:00 p.m.
Virtual office hours: by appointment or announced in class.

Website: Homework assignments will be completed on TheExpertTA.com.
Class notes, grades, and announcements will be made on Webcourses (accessible from myUCF).

Textbooks:

- *College Physics* (3rd edition), by Knight, Jones and Field. Some lab sections require a manual while others are done only on-line. Check with your lab GTA. The UCF Bookstore carries a custom volume of this book for our course including only the chapters we will cover. We will be covering chapters 20-26 and 17-18. If you choose not to purchase this book, any algebra-based physics textbook should cover most of the same material. The fundamentals of what we are covering is the same in all textbooks, however the examples, pedagogical style, and some applications will be different.
- *In-Class Interactive Response System:* We will be using the **Learning Catalytics** Interactive Response System. This requires that you have a Wi-Fi-enabled device such as a smartphone, tablet, iPod Touch, or laptop computer with you in class every day. Please contact me immediately if this is a problem so that we can find a device you can use for the semester. This will take the place of the more-familiar “clicker” devices and questions. If I refer to “clickers” or “clicker questions” it means questions answered through Learning Catalytics in class.
- *If you already have the book or alternative and do not purchase the course textbook:* At a minimum you will need to purchase access to TheExpertTA to be able to complete the homework assignments and purchase access to Learning Catalytics to answer in class questions.

To register for online homework, go to:
<https://www.theexpertta.com/registration>
Use Class Code: USE11FL-2D78CE-1G0

Grading:

Your final grade will be based on the following:

- Two in-class exams (two highest of three exams): 34%
- Final exam (cumulative): 24%
- Laboratory and in-lab exercises: 18%
- Homework: 14%
- In-Class Learning Catalytics questions: 10%

There will be three in-class exams during the semester, and a cumulative final exam. The lowest of the regular mid-terms will be dropped. **If you miss an exam for *any* reason, that will be your dropped exam.** Therefore, you should plan to make your best effort on all three mid-term exams. Because the final is cumulative, it gives you an opportunity to show you have learned material from the early part of the course where you might not have done as well on earlier exams. Therefore, if it helps your grade to do so, the final exam will count for 34% of your grade and the midterms for only 24%.

All exam grades are final 72 hours after they have been returned. Contact me before this 72-hour period is over if you have a grading dispute. See the rest of the missed work policy below. Plus and minus grades (A-, B+, etc.) will **NOT** be given. The default letter grade scale for non-exam items will be:

A: 88-100 B: 75-88 C: 60-75 D: 50-60 F: below 50

I reserve the right to adjust the grade scale, and the grade scale for exams will be posted after each exam with adjustments (a “curve”) if any. These adjustments, if made, will only help your grade. Please read the detailed instructions I provide on webcourses on how to calculate your numerical grade and determine the corresponding letter grade.

Assignments:

First On-line Assignment:

I am required to document students' academic activity at the beginning of the course. In order to document that you began this course, please complete the Syllabus Quiz Assignment on Webcourses@UCF (Canvas) by the end of the first week of classes, or as soon as possible after adding the course. Failure to do so will result in a delay in the disbursement of your financial aid. This is the only assignment that you will complete on Webcourses. All other homework will be completed on *TheExpertTA.com*.

Meet Josh:

The class is large. Without each of us making an effort, many of you will be anonymous to me. Your learning experience will be more effective if I know you and if you feel comfortable coming to my office hours for help. To establish a line of communication, I'm assigning each of you to have an individual meeting with me during the first two weeks of the course. These meetings will be only 4 minutes long, but this is an assignment and your attendance will be scored as a 100/100 on the assignment. This is your easiest homework assignment; do it. A web-based sign-up system will be made available to you by the start of the semester for you to choose the 15-minute interval during which we will meet in my office. **NOTE: If you took PHY 2053 from me in Fall 2016, you are exempt from this assignment. However, you may still book an appointment to meet with me to discuss any issues or concerns.**

Online Homework: All homework (except that noted above) will be completed using the online system at **TheExpertTA.com**. Homework plays a central role in this course. If you have understood the underlying concepts the exercises are straightforward, but if you are trying to guess the "right equation" you will fail. Homework will be assigned for each chapter we cover. No homework extensions will be given. Information about how to register for homework will be provided in class. Information on individual assignments will be provided in class and announced on Webcourses and via Twitter.

To register for online homework, go to:

<https://www.theexpertta.com/registration>

Use Class Code: USE11FL-2D78CE-1G0

Late homework will have a 25% penalty for each day past the due date. All homework will be completed on [TheExpertTA.com](https://www.theexpertta.com) (with the exception of the "Meet Josh" assignment and the syllabus quiz on WebCourses. Plan ahead to avoid the inevitable connectivity or other technical problems. One homework assignment will be dropped to handle the case where you cannot turn in an assignment for some reason.

Learning Catalytics and Attendance:

Your three lowest Learning Catalytics scores (based on percentage score, not total number of points) will be dropped to handle unavoidable absences. You must bring your device every day. If you do not have it, or it is not functioning for some reason, **check in with me at the beginning and end of class so that I can record that you were attending class even though no Learning Catalytics questions were answered.**

The policy for Learning Catalytics questions is different than that for homework and exam questions: you are encouraged to collaborate with your neighbors during the question. Frequently questions will be asked a second time, and the system will direct you to confer with specific neighbors. Thus at the start of each class you will identify where you are sitting in class using a seat map of the classroom similar to what you would use to choose a seat at a concert or on an airplane. You will receive 50% credit for participation in each question, and 100% if you get the

answer correct. **There will be attendance questions that count extra and that require your presence in the classroom to answer correctly.**

The course ID on [LearningCatalytics.com](https://www.learningcatalytics.com) will be announced. Each day there will be a “session ID” that you will use to join the active session. Occasionally there will be activities for you to complete using [LearningCatalytics.com](https://www.learningcatalytics.com) at home at your own pace.

Laboratory:

You are each enrolled in a smaller lab section that meets for three hours each week. In your lab class you will have a different instructor and an overall lab coordinator. Information on the labs is provided to you in your laboratory syllabus. Everything done in your laboratory sections counts for 18% of your overall course grade. The lab exercises will help you learn the material and will therefore also help you do better on your exams. Note that there are two different modes of labs associated with this course. Please get details from your lab GTA. Follow-up with me if you have concerns that are not addressed by your GTA.

Course Description and Requirements:

PHY2054C is the second part of the two-semester sequence in introductory physics offered primarily for students majoring in information technology, the biological sciences and pre-health professions. Emphasis is placed on understanding major principles and concepts, and Algebra with simple Trigonometry is used to clarify them. Students should have a good working knowledge of Algebra and Trigonometry at the level of MAC1104 and MAC1114 or equivalent.

Information about this course (syllabus, class-notes, etc.) will be available on Webcourses (via myUCF). In addition, I will use your official UCF e-mail to send you announcements from time to time, so be sure to check your e-mail daily. The website will be frequently updated as the course progresses itself.

This is a course about objective reality. Your opinion of how you think things are, or should be, will not matter in this class.

This is a fast-paced course. The content of this course is selected to match nation-wide standards for Physics courses, which are often used to prepare students for careers in Medicine and Life Sciences. During the course we will typically work through roughly one chapter per week. Your primary sources of information for the new concepts are your instructor, the textbook and your class notes. The syllabus shows which sections you need to read for each day of class. Here is an estimate of the effort needed for 2054C:

- Reading 20-30 pages of text each week – 3 hours.
- Web based homework & time studying concepts – 5 hours
- Laboratory – 3 hours
- Classroom time – 3 hours
- Estimated weekly effort – 14 hours

You can see that you need to plan on having enough time to do your best in this class.

It is extremely important NOT to get behind! Physics builds on itself inexorably, and once you are behind it will be very difficult to catch up with it again. And don't assume that because you read a section, you understand it. Until you can consistently do the problems successfully, you don't understand the material.

Course Objectives, Or, Why Am I Learning About Magnetic Fields?

Aside from the practical matter that UCF is presumably requiring you to take this course to get your degree, there is actually some value to you in learning the material! Physics is, in many ways, a much simpler scientific discipline than ones you may be majoring in. It is an excellent test case for the scientific method and for quantitative thinking and reasoning. For those going into the medical profession, the experiments you perform in life sciences will be much more difficult to interpret than those we do in Physics. Thus, this is an opportunity for you to see simple quantitative reasoning applied to real-world situations and see them work at high precision.

The mission of the course is to learn tools of critical and quantitative analysis and thinking, using Physics as a model. You do not need to memorize the formulas you encounter but you have to master a number of important concepts and know how to apply your knowledge on a broad range of problems in Science and Technology. We will be learning critical and quantitative reasoning. We will learn techniques to check our answers to make sure they are reasonable. We will learn the importance of experimentation on which our theories are built. We will learn problem-solving techniques. In addition, some of the content will have direct applications to your everyday lives as well as your future professional endeavors.

Examinations: The exams will include problems to be worked out and multiple choice questions. You must have with you at least one number two (2) pencil, and a computer scored answer sheet (a pink scantron) at every exam. You also must know your student ID number (PID) and record it accurately in the proper location on the Test Form and on each written exam. A **non-graphing, non-programmable** calculator may be used during exams. You may be provided with an equation sheet or allowed to bring your own. Details will be announced prior to the first exam. The Office of Student Accessibility Services will provide reasonable accommodation to students with disabilities. A valid UCF photo ID card is required when you turn in your exam answer sheet.

Teaching Method:

Content: We will cover most of Chapters 17-28 of the textbook, though some chapters and sections may be skipped as announced in class. Classes will include demonstrations and examples of working through problems. I will post a draft version of my notes on the class website prior to class and then an “as taught” version after each class. You may also wish to share notes with other students. The reading assignments in the schedule below are to be completed before class on the day listed. The design of the classes will assume that you have completed the reading assignment.

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Questions: I favor an interactive classroom environment. Be prepared to ask and answer questions. Time permitting, I will answer your questions in class. You can send in questions by text message during class to 480-3UCFPHY (this number will only be checked during class). If you are confused about a topic or would like to follow-up, please come to office hours or make an appointment for another time or for virtual office hours in the Webcourses chat area or using an instant messaging system.

Lectures: Lectures will be a combination of demonstrations, computer slide presentations, chalkboard example problems, (given on the screen via projector from a camera recording my writing), and clicker questions. While the notes will be available online, there is no substitute for attendance. In my experience, the greatest challenge facing students is to internalize the concepts that we are covering, in other words, to truly believe that nature really does follow the (simple) laws of physics. Frequently our everyday experience, crafted as it is by a complicated environment, gives us erroneous intuition about how the universe works. The demonstrations in class, as well as your labs, will help you see that the laws of physics truly describe the way the universe works.

Supplemental Instruction: Supplemental instruction (SI) is an academic success and retention program for historically difficult courses. SI uses regularly scheduled study sessions led by peers called SI leaders. SI leaders have taken the course before and received an “A”. They undergo continuous training in proactive strategies to conduct effective SI sessions. SI leaders attend all classes, take notes, and do all the assignments. They conduct 4 SI sessions each week. During these sessions, SI leaders help students apply study strategies to the course content. SI leaders help students work cooperatively using the textbook, lecture notes, and other materials to build accurate information, solve problems, work on sample tests and practice to prepare for exams. SI leaders do not lecture but create a comfortable atmosphere for teamwork and group study and models effective study habits. In SI sessions, students learn how to integrate course content and study skills while working together.

SI sessions are voluntary, anonymous, and free to all students enrolled in courses that offer SI. Students who attend SI have a wide range of academic backgrounds and ability. Research shows that students who attend SI sessions on a regular basis can earn on an average one half to a full letter grade higher than their peers who do not attend SI.

Missed Work Policy: It is Physics Department policy that making up missed work will only be permitted for University-sanctioned activities and bona fide medical or family reasons. Authentic justifying documentation must be provided in every case (and in advance for University-sanctioned activities). At the discretion of the instructor, the make-up may take any reasonable and appropriate form including but not limited to the following: giving a replacement exam, replacing the missed work with the same score as a later exam, allowing a dropped exam, replacing the missed work with the homework or quiz average. Note that for this class, the dropped exam is the default policy for a missed exam for *any* reason. This is also the policy for homework and clicker absences.

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Golden Rule: Please read this information at the website <http://goldenrule.sdes.ucf.edu>.

UCF Creed: Please read this information at the website <http://www.campuslife.sdes.ucf.edu/UCFcreedpage.html>.

Conduct: Please don't have any sidebar conversations during class. There will be ample opportunity for you to talk during class at certain times. I encourage you to raise your hand (or text me) to ask relevant questions in class.

Student Accessibility Statement:

The University of Central Florida considers the diversity of its students, faculty, and staff to be a strength and critical to its educational mission. UCF expects every member of the university community to contribute to an inclusive and respectful culture for all in its classrooms, work environments, and at campus events. Dimensions of diversity can include sex, race, age, national origin, ethnicity, gender identity and expression, intellectual and physical ability, sexual orientation, income, faith and non-faith perspectives, socio-economic class, political ideology, education, primary language, family status, military experience, political beliefs, cognitive style, and communication style. The individual intersection of these experiences and characteristics must be valued in our community.

Title IX prohibits sex discrimination, including sexual misconduct, sexual violence, sexual harassment, and retaliation. If you or someone you know has been harassed or assaulted, you can find resources available to support the victim, including confidential resources and information concerning reporting options at www.shield.ucf.edu

If there are aspects of the design, instruction, and/or experiences within this course that result in barriers to your inclusion or accurate assessment of achievement, please notify the instructor as soon as possible and/or contact Student Accessibility Services.

For more information on diversity and inclusion, Title IX, accessibility, or UCF's complaint processes contact:

Title IX – EO/AA - <http://www.eeo.ucf.edu/> & askanadvocate@ucf.edu

Disability Accommodation – Student Accessibility Services - <http://sas.sdes.ucf.edu/> & sas@ucf.edu

Diversity and Inclusion Training and Events – www.diversity.ucf.edu

Student Bias Grievances – Just Knights response team - <http://jkrt.sdes.ucf.edu/>

UCF Compliance and Ethics Office - <http://compliance.ucf.edu/> & complianceandethics@ucf.edu

Ombuds Office - <http://www.ombuds.ucf.edu>

Collaboration Policy: You may not collaborate on exams. You will be able to make an equation/note sheet to bring to each exam. Some clicker questions may be answered individually (at the

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beginning of class, to check reading comprehension), while in general they will encourage group discussion.

Email: It is very likely that I will need to send email to you regarding class logistics or material. These e-mails will go to the e-mail address on record at UCF. In addition, announcements will be posted on Webcourses. If you write an email to me, please identify yourself in it, and **please include PHY2054 in the subject line**. Send e-mail to my UCF e-mail (josh@ucf.edu). Do not send me messages within Webcourses.

Calculators and Laptops: Calculators may be used for exams and for clicker questions. You may take notes on a laptop. However, **you may not use your laptop for facebook, web surfing, or other activities not directly related to class**.

Schedule:

We will cover chapters 20 through 26 in order, followed by chapters 17 and 18, Note: these chapter numbers refer to the numbering in the full textbook. If you purchased the slim custom volume from the bookstore then the chapters have already been arranged in the order below and we'll be going through that book in that sequence.

Jan. 10	20.1-20.2	Introduction. Charges and Atoms.
Jan. 12	20.3-20.5	Coulomb's Law.
Jan. 17	20.6-20.7	Forces and Torques in an Electric Field.
Jan. 19	21.1-21.3	Electric Potential and Electric Potential Energy.
Jan. 24	21.4-21.6	Connecting Electric Potential and Electric Field.
Jan. 26	21.7-21.8	Capacitors, Dielectrics and Energy.
Jan. 31	Chapters 20-21	Review and catch up.
Feb. 2	Exam 1	All material covered to date.
Feb. 7	22.1-22.3	Electrical Current and Batteries
Feb. 9	22.4-22.6	Ohm's Law, Energy and Power.
Feb. 14	23.1-23.3	Series and Parallel Circuits and Kirchhoff's Laws.
Feb. 16	23.4-23.7	More Complex Circuits.
Feb. 21	24.1-24.3	Magnetic Field.

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Feb. 23	24.4-24.6	Magnetic Fields and Currents.
Feb. 28	Chapters 22-24	Review and catch up.
Mar. 2	Exam 2	All material covered after Exam 1
Mar. 7	24.7-24.8	Torques, motors, and magnetic materials.
Mar. 9	25.1-25.3	Magnetic Flux and Induced Currents.
Mar. 21	25.4-25.5	Faraday's Law. Electromagnetic Waves.
Mar. 23	25.6-25.7	Photons and the Electromagnetic Spectrum.
Mar. 28	26.1-26.4	AC Electricity and Transformers.
Mar. 29	26.5-26.7	Capacitor and Inductor Circuits.
Apr. 4	Chapters 24-26	Review and catch up.
Apr. 6	Exam 3	All material covered after Exam 2
Apr. 11	17.1-17.3	Wave Nature of Light and Diffraction.
Apr. 13	17.4-17.6	Interference, Diffraction Slit, Circular Aperture.
Apr. 18	18.1-18.3	Ray Optics, Reflection and Refraction.
Apr. 20	18.4-18.6	Images with Lenses and Mirrors.
May 2 1:00 - 3:50 pm	Final Exam	Cumulative Final Exam

We may adjust the schedule according to how long it takes us to cover each chapter.

Reminder: if you have questions, please ask. If you don't understand the material: see me in office hours; make an appointment if you cannot make office hours; take advantage of the Supplemental Instruction; study with your peers.

One Last Item:

This syllabus is subject to change. The latest version will always be available on the class web site.

Version 1.0: Initial Version. December 26, 2016.

Version 1.1: Changed Friday office hours to 11 a.m. - 12 p.m. January 5, 2017.

Version 1.2: Changed Tuesday office hours to 3:30 p.m. - 4:45 p.m. Updated information on lab manuals and lab instructional modes. January 18, 2017.

