

Term Information

Effective Term Summer 2021

General Information

Course Bulletin Listing/Subject Area Physics
Fiscal Unit/Academic Org Physics - D0684
College/Academic Group Arts and Sciences
Level/Career Undergraduate
Course Number/Catalog 1231
Course Title Physics for Engineering Technology: Electricity and Magnetism
Transcript Abbreviation ET Elec., Mag.
Course Description Calculus-based introduction to electricity and magnetism, for students in Engineering Technology
Semester Credit Hours/Units Fixed: 3

Offering Information

Length Of Course 12 Week, 8 Week, 7 Week, 6 Week, 4 Week
Flexibly Scheduled Course Never
Does any section of this course have a distance education component? No
Grading Basis Letter Grade
Repeatable No
Course Components Laboratory, Lecture, Recitation
Grade Roster Component Recitation
Credit Available by Exam Yes
Exam Type Departmental Exams
Admission Condition Course No
Off Campus Never
Campus of Offering Lima, Mansfield, Marion, Newark, Wooster

Prerequisites and Exclusions

Prerequisites/Corequisites Prereq: 1250, 1250H, or 1260; and Math 1141 or 1151 or 1154 or above; or permission of instructor.
Concur: Math 1152, 1158, 1161, 1172, 1181H, or 4181H.
Exclusions Not open to students with credit for Physics 132 or 1251
Electronically Enforced Yes

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code 40.0801
Subsidy Level Baccalaureate Course
Intended Rank Freshman, Sophomore

Requirement/Elective Designation

Required for this unit's degrees, majors, and/or minors

General Education course:

Physical Science

The course is an elective (for this or other units) or is a service course for other units

Course Details

Course goals or learning objectives/outcomes

- Students in natural sciences gain understanding of the principles, theories, and methods of modern science, the relationship between science and technology, the implications of scientific discoveries and the potential of science and tech.

Content Topic List

- Coulomb's Laws
Electric fields, force, and flux
Gauss's Law
Simple circuits, Ohm's Law, LC circuits, and capacitors
Magnetic forces, fields, and torque
- No

Sought Concurrence

Attachments

- syllabus_phys_1231.pdf: Course Syllabus
(Syllabus. Owner: Gramila, Thomas J)
- gen_ed_rationale_1231.pdf: General Ed Rationale
(Other Supporting Documentation. Owner: Gramila, Thomas J)
- GE-1231.doc: General Ed Assessment
(GEC Course Assessment Plan. Owner: Gramila, Thomas J)
- slds_info.pdf: SLDS text explanation
(Other Supporting Documentation. Owner: Gramila, Thomas J)

Comments

- Updated documents uploaded (correctly this time) to address contingencies and recommendations from NMS panel feedback from 3-26-20. Please note SLDA_info document, which explains the minor differences of the syllabus text from that suggested in the last review. *(by Gramila, Thomas J on 03/17/2021 02:19 PM)*
- Address contingencies and recommendations sent on 3-26-20 with regional campus faculty per email from Bernadette Vankeerbergen on 10-21-20 *(by Bundschuh, Ralf Andreas on 10/21/2020 02:06 PM)*
- See NMS panel feedback sent on 3-26-20. *(by Vankeerbergen, Bernadette Chantal on 03/26/2020 04:30 PM)*
- 9/30/19: Please change the effective term to Spring 2021. The Autumn 2020 deadline for new course proposals had been 07/01/19. *(by Haddad, Deborah Moore on 09/30/2019 01:24 PM)*

COURSE REQUEST
1231 - Status: PENDING

Last Updated: Vankeerbergen,Bernadette
Chantal
03/17/2021

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Gramila,Thomas J	09/27/2019 05:40 PM	Submitted for Approval
Approved	Perry,Robert James	09/30/2019 01:07 PM	Unit Approval
Revision Requested	Haddad,Deborah Moore	09/30/2019 01:24 PM	College Approval
Submitted	Perry,Robert James	09/30/2019 02:30 PM	Submitted for Approval
Approved	Perry,Robert James	09/30/2019 02:32 PM	Unit Approval
Revision Requested	Haddad,Deborah Moore	09/30/2019 03:03 PM	College Approval
Submitted	Perry,Robert James	09/30/2019 05:34 PM	Submitted for Approval
Approved	Perry,Robert James	09/30/2019 05:35 PM	Unit Approval
Revision Requested	Haddad,Deborah Moore	09/30/2019 05:41 PM	College Approval
Submitted	Gramila,Thomas J	09/30/2019 06:47 PM	Submitted for Approval
Approved	Perry,Robert James	10/01/2019 12:01 PM	Unit Approval
Approved	Haddad,Deborah Moore	10/01/2019 01:07 PM	College Approval
Revision Requested	Vankeerbergen,Bernadette Chantal	10/06/2019 08:49 PM	ASCCAO Approval
Submitted	Gramila,Thomas J	02/13/2020 02:57 PM	Submitted for Approval
Approved	Perry,Robert James	03/05/2020 05:16 PM	Unit Approval
Approved	Haddad,Deborah Moore	03/05/2020 06:21 PM	College Approval
Revision Requested	Vankeerbergen,Bernadette Chantal	03/26/2020 04:31 PM	ASCCAO Approval
Submitted	Perry,Robert James	03/26/2020 07:20 PM	Submitted for Approval
Revision Requested	Bundschuh,Ralf Andreas	10/21/2020 02:06 PM	Unit Approval
Submitted	Gramila,Thomas J	10/21/2020 04:22 PM	Submitted for Approval
Revision Requested	Bundschuh,Ralf Andreas	10/26/2020 07:50 AM	Unit Approval
Submitted	Gramila,Thomas J	03/17/2021 02:20 PM	Submitted for Approval
Approved	Humanic,Thomas John	03/17/2021 02:22 PM	Unit Approval
Approved	Vankeerbergen,Bernadette Chantal	03/17/2021 08:48 PM	College Approval
Pending Approval	Jenkins,Mary Ellen Bigler Hanlin,Deborah Kay Oldroyd,Shelby Quinn Hilty,Michael Vankeerbergen,Bernadette Chantal	03/17/2021 08:48 PM	ASCCAO Approval

Prof. Bill Putikka**Office:** 377 Ovalwood Hall**Phone:** (614) 292-3882**Email:** putikka.1@osu.edu**Office Hours:** Tues. 2:00 - 3:00, Thurs. 2:00 - 3:00 and by appointment**TEXT:** Serway & Jewett, *Physics for Scientists and Engineers with Modern Physics*, 10th ed.**LAB:** *Laboratory Manual Physics 1251*, 7th ed.**Box web page** box.osu.edu**Course web page:** carmen.osu.edu**WebAssign web page:** www.webassign.net/osu/student.html

Homework is due by midnight on the following Tuesday.

Grading:

Midterm	150
Quizzes (6/7)	120
Labs	30
Homework	70
Final	250
Total	620

Jan 12 Ch 23.1-3 Electric Charge

Lab: Electric Force/Coulomb's Law

14 Ch 23.4-5 Electric Field

QUIZ 1

19 Ch 23.6-7 Electric Field

Lab: Electric Field

21 Ch 24.1-2 Electric Flux

QUIZ 2

26	Ch 24.2-3	Gauss's Law	
		Lab: Electric Flux	
28	Ch 24.3-4	Gauss's Law	QUIZ 3
Feb 2	Ch 25.1-3	Electric Potential	
		Lab: Electric Potential	
4	Ch 25.4-8	Electric Potential	QUIZ 4
9	Ch 26.1-4	Capacitance	
		Lab: Electric Current	
11		MIDTERM Ch 23-26	NO QUIZ
16	Ch 26.5-7, Ch 27.1-4	Current and Resistance	
		Lab: Qualitative Circuits	
18	Ch 27.5-6, Ch 28.1-3	Circuits	QUIZ 5
23	Ch 28.4, Ch 29.1-4	Magnetic Forces	
		Lab: Quantitative Circuits	
25	Ch 29.5, Ch 30.1-2	Magnetic Fields	QUIZ 6
Mar 2	Ch 30.3-5, Ch 31.1-2	Magnetic Fields, Induction	
		Lab: Magnetic Torque/Magnetic Fields	
4	Ch 31.3-6, Ch 32.1-3	Induction	QUIZ 7

Physics 1231 is a Physical Science course in the Natural Science category of the GE. The goals and objectives for this category are:

Goals/Rationale: Students in natural sciences gain understanding of the principles, theories and methods of modern science, the relationship between science and technology, the implications of scientific discoveries and the potential of science and technology to address problems of the contemporary world.

Learning Objectives for Physical Science:

1. Students understand the basic facts, principles, theories and methods of modern science.
2. Students understand key events in the development of science and recognize that science is an evolving body of knowledge.
3. Students describe the inter-dependence of scientific and technological developments.
4. Students recognize social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.

How the Learning Objectives are Met:

1. Student preconceptions and alternate conceptions of physical law are addressed head-on in P1231. This is a necessary component of any contemporary introduction to physics, and is addressed in all components of the course.
2. Students learn the scientific theories that have developed from the 1600s to the present day. They learn different modes of approaching the same phenomena, such as field and potential methods in electrostatics.
3. Students understand that P1231 introduces the basic physical laws that underlie all engineering applications. Examples of applications are provided in the textbook and in demonstrations in lectures.
4. The social implications of physics lie in applications. While these implications are taken up more fully in the engineering courses that discuss those applications, this course reviews the historical underpinnings of modern technology.

Student Life Disability Service Statement

Any student who expects to need an accommodation based on the impact of a disability should contact Student Life Disability Services (SLDS), to privately discuss their specific needs. SLDS will determine what accommodation is possible. SLDS does not reach out to students based on submission of a previous IEP, rather students must contact the office for an appointment. It is the student's responsibility to communicate any accommodation granted by SLDS to the professor of the course. Please contact SLDS by phone at (419) 755-4304, by e-mail at mcgregor.40@osu.edu, or stop by the office in Ovalwood 279.

Academic Misconduct Statement

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee via the Associate Dean.

Drop/Withdrawal Statement

It is the students responsibility to know the deadlines for dropping a course or withdrawing from the University. Term drop & withdrawal deadlines can be found at: <http://registrar.osu.edu/> (click on the current term under Important Dates and scroll down to ADD/DROP/WITHDRAW DEADLINES). If you receive financial aid, you should always talk with a financial aid specialist prior to adjusting your schedule. If you stop attending a course but do not drop it, you risk receiving a failing grade which could negatively affect your GPA and your financial aid status. You can call 419-755-4317 to set up an appointment with an academic advisor or a financial aid specialist in 104 Riedl Hall.

Retention

The Ohio State University-Mansfield is committed to the success of students. If you are having academic or personal difficulties, you can contact Darla Myers at 419-755-4036, Ovalwood 283, for referral resources.

Mental Health Services

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a students ability to participate in daily activities. The Ohio State University at Mansfield offers services to assist you with addressing these and other concerns you may be experiencing. You can learn more about the broad range of confidential mental health services available on campus via the New Directions Student Assistance Program (SAP) by visiting newdirectionsforlife.com/ or calling 419-529-9941 (no cost to students). They see students on campus in Ovalwood Hall. Local crisis services are available by calling 419-522-4357. Ohio State also has an afterhours service available

by calling 614-292-5766 and choosing option 2 after hours, which includes weekends and holidays.

Student Conduct

The code of student conduct is established to foster and protect the core missions of the university, to foster the scholarly and civic development of the university's students in a safe and secure learning environment, and to protect the people, properties and processes that support the university and its missions (http://studentaffairs.osu.edu/resource_csc.asp). Students who violate faculty expectations may be subject to the code of conduct. For mental health and other behavioral related concerns, contact Student Life at 419-755-4317 and ask for an appointment with Dr. Donna L Hight, Assistant Dean, Student Life and Success. As a responsible community member, do not allow others to act inappropriately and impact the community.

Student Assistance with Difficulties

Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live, and believes this may affect their performance in the course, is urged to contact Michelle McGregor, Coordinator, Student Support Services at 419-755-4304, for support. Furthermore, please notify the professor if you are comfortable in doing so. This will enable me to provide any resources that I may possess.

Discrimination

The Ohio State University at Mansfield is committed to providing a learning, working and living environment that promotes personal integrity, civility and mutual respect in an environment free of discrimination of any type. This includes students creating a hostile environment for other students. To file a complaint, contact Student Life at 419-755-4317 and ask for an appointment with the Assistant Dean, Student Life and Success or Human Resources at 419-755-4047 and ask for an appointment with the Chief Human Resources Officer, who will connect you with the appropriate Columbus Offices.

Title IX and Sexual Misconduct

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, etc. If you or someone you know has been harassed or assaulted, you can find more information and the appropriate resources at <http://titleix.osu.edu/>.

HOW TO REPORT

Reports of sexual misconduct can be made to one of the following individuals:

Donna L. Hight, Ph.D.
Assistant Dean, Student Life and Success
419-755-4317
hight.6@osu.edu

Sgt. Jeff Hoffer
Campus Police
419-755-4210
hoffer.30@osu.edu

Sarah Metzger
Campus Sexual Assault Advocate
419-565-2489
smetzger@thedvshelter.com

Notice of an incident to the officials listed above, other than the Campus Sexual Assault Advocate, is considered official notice to the university. You can expect reports received by these individuals to be investigated and properly resolved through administrative procedures. Information will be shared only as necessary with investigators, witnesses, and the accused individual. The Campus Sexual Assault Advocate and the New Directions Student Assistance Program (SAP) staff are considered confidential resources.

Introduction:

These learning objectives and how they are met match what is presented in the course syllabus. In addition, they are identical to those of Physics 1251, which is a long established General Education Physical Science course. We include here as well a short discussion of the lab portion of the course, as well as information related to the courses appropriateness for BA and/or BS students.

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4. The social implications of physics lie in applications. While these implications are taken up more fully in the engineering courses that discuss those applications, this course reviews the historical underpinnings of modern technology.

Laboratory Information:

'What type(s) of experiences will students have in the laboratory component of the course?'

Students will work in small groups in weekly 2 hour lab sessions exploring various topics in electricity and magnetism. These include forces between electric charges, electron deflection behavior, fundamental circuit principles, such as ohms law and series and parallel circuits. Properties of magnetic fields are also explored. Experiments undertaken by students focus on measurements using provided apparatus that highlight fundamental behaviors, where configuration of the apparatus is left to the student. Measurements taken are compared with theoretical predictions derived by the students for the various situations and phenomena. Pre-labs are used to prepare students for the theoretical work, and comparisons are completed in class.

BA/BS Degrees:

Physics 1231 is intended for both BA and BS students. It's topics and content closely match an existing BA/BS course: Physics 1251. In fact, it is our expectation that the lecture portions of both courses will be shared. Aspects of 1231 that justify it's suitability for BS students include:

A Calculus pre-requisite.

Pre-requisite of a BS degree approved course: Physics 1250.

Sophisticated scientific knowledge, including, for example, Gauss's Law, which relates two and three dimensional electrical quantities, as well as various topics in Magnetism

Computer assisted data collection and analysis in the lab portion of the course.

The course parallels, but is a bit shorter than, the structure and topics of a course required for a physics major (again, Physics 1251) .

Learning Outcomes Assessment Plan for Physics 1231

The specific learning goal for natural science GE courses is to foster an understanding of the principles, theories and methods of modern science, the relationship between science and technology, and the effects of science and technology on the environment. This has been expanded into four learning objectives (outcomes).

Objective 1 is that the students shall understand the basic facts, principles, theories and methods of modern science. As a direct measure, we wish for Physics 1231 to obtain student responses biennially on an assessment post-test to determine the normalized gain $G = (\text{post}\% - \text{pre}\%)/(100 - \text{pre}\%)$ in understanding material that could be attributed to this instruction. When scheduling permits, reconfirming the average pretest student response level will also be done. National assessment tests of Physics 1231 topics are not as well established as those used for Newtonian mechanics, such as the FCI test. One such test is the Conceptual Survey of Electricity and Magnetism (CSEM), developed to assess students' knowledge about topics in introductory electricity and magnetism. Early studies using the CSEM for courses comparable to Physics 1231 suggest (1) that students' pre-test scores will barely exceed random and (2) that gains near (above) $G = 0.25$ would characterize traditional (new interactive engagement) physics instruction. An average gain much below 0.2 would then suggest that improvements must be made, while any gain over 0.3 would likely signal a significant learning improvement. As an indirect measure, biennially we will survey a sample of students to determine their level of agreement with Physics 1231 having met this objective. As objective 1 is most strongly coupled to the course's primary objective, we would wish to have >80% of the respondents agree that this particular objective has been met. Results greater than 'B' (3.0/4) on our exit polling for the 'value of X as part of this course' would also be related to successful instruction.

Satisfying the ***GE learning objectives 2 (students learn key events in the history of science), 3 (students provide examples of the inter-dependence of scientific and technological developments), and 4 (students discuss social and philosophical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world)*** is to some degree ancillary to meeting objective 1. Each can be successfully addressed best in the context and support of the presentation of the physics topics associated with objective 1. As a direct measure, we wish to occasionally have questions reflecting consideration of these objectives represented on Physics 1231 final exams. Professors responsible for writing the exam for Physics 1231 will be asked to identify instances in which a question used on his/her final exam measures one or more of the learning objectives 2, 3 or 4. Based on a sampling of the students' responses to questions so identified with a given objective over the year, an annual average of the percent correct scores will be computed, which if equal to 70% (consistent with the minimum for C- grade in this course) or greater will signify support of having satisfactorily met the goal of that particular objective. As an indirect measure, biennially we will survey a sample of our students to determine their level of agreement with Physics 1231 having met each of these objectives. Realizing that a given course may not strongly meet all GE objectives, we would wish that the average of the percent responses to the four learning objectives be >50%, indicating that these objectives as a set have been perceived to have been reasonably met.

The syllabus information was altered to follow the suggestions from 3/26, but do not follow the precise wording. The statement was modified by the SLDS office in the branch campus.