

PHY 331 - Principles of Modern Electromagnetism

Spring 2019

Course Format: in-person

Days: Tuesday & Thursday

Times: 12:00 p.m. – 1:15 p.m.

Location: SANTN 130 (Polytechnic campus)

Instructor information

Name: [Dr. Igor A. Shovkovy](#)

Office Location: Wanner Hall 340F

Office Hours: 10:30 a.m. – 11:30 a.m. on **Mondays & Wednesdays**, and by appointment.

To make an appointment, please contact the instructor via email at least 1 day in advance.

Email: Igor.Shovkovy@asu.edu

Phone Number: 480-727-1953

College Contact: CISA@asu.edu

This course is offered by the [College of Integrative Sciences and Arts](#). For more information about the college, visit our website: cisa.asu.edu/. If you have questions or concerns about this course please speak with your instructor. If your instructor is unable to address your concerns, please send your inquiry to cisa@asu.edu.

Course information

Prerequisites: APM 270 (Mathematics of Change I), MAT 274 (Elementary Differential Equations) or MAT 275 (Modern Differential Equations). Students should have knowledge of vector algebra, differential calculus and integral calculus.

While **PHY 131** (University Physics II: Electricity and Magnetism) is not an official prerequisite, it is highly recommended that students take it before enrolling into this course.

Course Description: A study of the unified description of electromagnetic phenomena provided by Maxwell's equations in differential and integral form. The planned list of topics includes Maxwell's equations, electrostatic fields, Laplace's and Poisson's equations, dielectrics, magnetic fields and materials, electromagnetic induction and Faraday's law, displacement current and Ampere's law, electromagnetic waves, and, if time permits, the photon theory of light.

Course Objectives: Students are expected to (i) gain a theoretical understanding of key concepts of electromagnetism, (ii) learn methods and techniques commonly used in studying electrostatic and magnetostatic systems, (iii) develop practical problem solving skills, (iv) strengthen logical thinking and reasoning.

Learning Outcomes: Through weekly readings, written homework assignments, and exams, students will have demonstrated that they are able to

- solve conceptual and numerical problems in electromagnetism;

- apply vector algebra, differential calculus and integral calculus in electromagnetism;
- use curvilinear coordinates in physics context;
- understand and explain electromagnetic phenomena using the fundamental laws of physics;
- effectively communicate physics ideas;
- use proper terminology in the context of electromagnetism.

Required Textbook:

Introduction to Electrodynamics (4th edition) by **David J. Griffiths**
ISBN: 9780321856562

Additional Textbook (optional):

Field and Wave Electromagnetics (2nd edition) by **David K. Cheng**
ISBN: 978-0201128192



Assignments, Exams and Grading

Percentage Distribution:

Homework assignments	35%
Mid-term Exam 1	15%
Mid-term Exam 2	15%
Mid-term Exam 3	15%
Final Exam	20%
Total	100%

Course Grading System:

Grades will be determined by the percentage you accumulate:

A	90% – 100%	Excellent
B	78% – 89.9%	Good
C	66% – 77.9%	Average
D	54% – 65.9%	Passing
E	< 54 %	Failure
XE		Failure due to Academic Dishonesty

For your own protection, you should keep a copy of everything you hand in, and you should keep your graded assignments at least until grades are finalized at the end of the semester, and in the event you wish to contest any grades.

Grade Appeals

Students must first speak with the instructor of the class to discuss any disputed grades. If, after review, a resolution is not achieved students may proceed with the appeal process. Student grade appeals must be processed in the regular semester immediately following the issuance of the grade in dispute (by

commencement for fall or spring), regardless whether the student is enrolled at the university. Complete details are available in the [ASU Grade Appeals policy](#).

Tentative schedule

The exact schedule for lectures, quizzes and examinations will depend on how long it takes to cover the material. The following is a tentative schedule:

Date	Description
Jan. 8, 2019	First class
Feb. 7, 2019	1st midterm test
Mar. 4-8, 2019	Spring Break – No classes
Mar. 21, 2019	2nd midterm test
Apr. 23, 2019	3rd midterm test
Apr. 25, 2019	Last class
Apr. 30, 2019	Final Exam (12:10 p.m. - 2:00 p.m) https://students.asu.edu/final-exam-schedule

Course Outline: http://shovkovy.faculty.asu.edu/syllabus/2019/Spring/phy331_schedule.pdf

Course Policies

Attendance is required. Students are responsible for all material presented in class, all homework, and for all changes to the schedule or plans announced in class.

- Students must adhere to university policies for the observance of religious practices in accordance with policy [ACD 304-04](#), “Accommodation for Religious Practices”. Additionally, students wishing to obtain an excused absence(s) for university sanctioned events/activities must follow policy [ACD 304-02](#), “Missed Classes Due to University-Sanctioned Activities”.

Homework is truly one of the most important components in this course. This is because doing homework is the only way to truly learn the material and build a good intuition for physics. Solving physics problems effectively is a skill that students must develop. The only known way to achieve this is by practicing. The lectures will only cover the key concepts. The text will elaborate on these concepts and provide further explanation of their meaning and on how one uses them to solve problems. There is no way to do well in this course if you do not give the homework assignments the effort they require. (Allow about **4 hours per week** for reading and homework assignments.) Your homework assignment should be neatly and clearly written. The front page should list your name, the date and the homework assignment number. Each problem should be clearly labeled. The problem solutions should contain detailed explanations. Late homework will **not** be accepted.

Tests and exams. The midterm tests will be given on the dates shown below in the tentative schedule (the actual dates will be announced in class). The final exam at the end of the semester is a comprehensive exam. The use of the textbook and class notes will not be permitted during the tests and exams.

Trigger Warning

Please note that some course content may be deemed offensive by some students, although it is not my intention to offend anyone. In addition, some materials that we link with online might also be considered offensive, troubling, or difficult to review in terms of language or graphics. I attempt to provide warnings when introducing this kind of material; yet if I forget to do so, or if something else (in my materials or posts from fellow students) seems offensive, please contact me at Igor.Shovkovy@asu.edu, or the faculty head, [Kelly Steele](#).

Classroom Behavior

We want to build a classroom climate that is comfortable for all. It is important that we (1) display respect for all members of the classroom – including the instructor and students; (2) pay attention to and participate in all class sessions and activities; (3) avoid unnecessary disruption during class time (e.g. having private conversations, reading the newspaper, surfing the Internet, doing work for other classes, making/receiving phone calls, text messaging, etc.); and (4) avoid racist, sexist, homophobic, or other negative language that may unnecessarily exclude members of our campus and classroom. This is not an exhaustive list of behaviors; rather, it represents examples of the types of things that can have a dramatic impact on the class environment. Your final grade may be reduced by 5% each time you engage in these sorts of behaviors.

Establishing a Safe Environment

Learning takes place best when a safe environment is established in the classroom. In accordance with [SSM 104-02 of the Student Services Manual](#), students enrolled in this course have a responsibility to support an environment that nurtures individual and group differences and encourages engaged, honest discussions. The success of the course rests on your ability to create a safe environment where everyone feels comfortable to share and explore ideas. We must also be willing to take risks and ask critical questions. Doing so will effectively contribute to our own and others intellectual and personal growth and development. We welcome disagreements in the spirit of critical academic exchange, but please remember to be respectful of others' viewpoints, whether you agree with them or not.

All incidents and allegations of violent or threatening conduct by an ASU student (whether on- or off-campus) must be reported to the ASU Police Department (ASU PD) and the Office of the Dean of Students. If either office determines that the behavior poses or has posed a serious threat to personal safety or to the welfare of the campus, the student will not be permitted to return to campus or reside in any ASU residence hall until an appropriate threat assessment has been completed and, if necessary, conditions for return are imposed. ASU PD, the Office of the Dean of Students, and other appropriate offices will coordinate the assessment in light of the relevant circumstances.

Email Communication

ASU email is an official means of communication among students, faculty, and staff. Students are expected to read and act upon email in a timely fashion. Students bear the responsibility of missed messages and should check their ASU-assigned email regularly. *All instructor correspondence will be sent to your ASU email account.* For help with your email go to: MyASU > Service > Live Chat OR New Ticket.

Prohibition of Commercial Notetaking Services

In accordance with [ACD 304-06 Commercial Note Taking Services](#), written permission must be secured from the official instructor of the class in order to sell the instructor's oral communication in the form of notes. Notes must have the note taker's name as well as the instructor's name, the course number, and the date.

University Policies

Academic Integrity

Arizona State University and the College of Integrative Sciences and Arts strongly believe in academic integrity; thus cheating and plagiarism is not tolerated. Students must refrain from uploading to any course shell, discussion board, or website used by the course instructor or other course forum, material that is not the student's original work, unless the students first comply with all applicable copyright laws; faculty members reserve the right to delete materials on the grounds of suspected copyright infringement.

Academic honesty is expected of all students in all examinations, papers, laboratory work, academic transactions and records. The possible sanctions include, but are not limited to, appropriate grade penalties, course failure (indicated on the transcript as a grade of E), course failure due to academic dishonesty (indicated on the transcript as a grade of XE), loss of registration privileges, disqualification and dismissal. For more information, see <http://provost.asu.edu/academicintegrity>.

If you fail to meet the standards of academic integrity in any of the criteria listed on the university policy website, sanctions will be imposed by the instructor, college, and/or dean. Academic dishonesty includes, but is not limited to, cheating on an academic evaluation or assignment, [plagiarizing](#), academic deceit (such as fabricating data or information), or falsifying academic records. Turning in an assignment (all or in part) that you completed for a previous class is considered self-plagiarism and falls under these guidelines. Any infractions of self-plagiarism are subject to the same penalties as copying someone else's work without proper citations. Students who have taken this class previously and would like to use the work from previous assignments should contact the instructor for permission to do so.

If you have any doubt about whether the form of cooperation you contemplate is acceptable, ask the TA or the instructor in advance of turning in an assignment. Please be aware that the work of all students submitted electronically can be scanned using plagiarism detection software, which compares them against everything posted on the internet, online article/paper databases, newspapers and magazines, and papers submitted by other students (including yourself if submitted for a previous class).

Student resources on Sun Devil Integrity and strategies for completing your work with integrity and avoiding plagiarism are available here: <https://provost.asu.edu/academic-integrity/resources/students>. If you have any questions about your work and the academic integrity policy, please discuss your assignment or concerns with your instructor or TA in advance of submitting an assignment.

Students with Disabilities

If you need academic accommodations or special consideration of any kind to get the most out of this class, please let me know at the beginning of the course. If you have a disability and need a reasonable accommodation for equal access to education at ASU, please call Disability Resources for Students (DRC). The site can be found at eoss.asu.edu/drc. Instructors cannot provide accommodations without authorization from the DRC.

Downtown Phoenix Campus

Post Office building, Suite 201

Phone: 602.496.4321

E-mail: DRCDowntown@asu.edu

Polytechnic Campus

Sutton Hall - Suite 240

Phone: 480.727.1039

E-mail: DRCPoly@asu.edu

Tempe Campus

Matthews Center building, 1st floor

Phone: 480.965.1234

E-mail: DRCTempe@asu.edu

West Campus

University Center Building, Room 130

Phone: 602.543.8145

E-mail: DRCWest@asu.edu

Mental Health

As a student, like anyone else, you may experience a range of challenges that can interfere with learning, such as strained relationships, increased anxiety, substance use, feeling down, difficulty concentrating and/or lack of motivation. These emotional health concerns or stressful events may diminish your academic performance and/or reduce your ability to participate in daily activities. ASU Counseling Services provides counseling and crisis services for students who are experiencing a mental health concern. Any student may call or walk-in to any ASU counseling center for a same day or future appointment to discuss any personal concern. Here is the Web site: eoss.asu.edu/counseling. After office hours and 24/7 ASU's dedicated crisis line is available for crisis consultation by calling 480-921-1006.

Student Code of Conduct

Students are required to adhere to the behavior standards listed in the Arizona Board of Regents Policy Manual Chapter V –Campus and Student Affairs: Code of Conduct located online at students.asu.edu/srr/code and the ACD 125: Computer, Internet, and Electronic Communications available at asu.edu/aad/manuals/acd/acd125.html.

Students are entitled to receive instruction free from interference by other members of the class. An instructor may withdraw a student from a course when the student's behavior disrupts the educational process under USI 201-10 asu.edu/aad/manuals/ssm/ssm201-10.html. An instructor may withdraw a student from a course with a mark of "W" or "E" when the student's behavior disrupts the educational process. Disruptive classroom behavior for this purpose is defined by the instructor.

Harassment Prohibited

ASU policy prohibits harassment on the basis of race, sex, gender identity, age, religion, national origin, disability, sexual orientation, Vietnam era veteran status, and other protected veteran status. Violations of this policy may result in disciplinary action, including termination of employees or expulsion of students. Contact the professor if you are concerned about online harassment of any kind, and he/she will put you in contact with the Dean of Students office.

Title IX

Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at sexualviolenceprevention.asu.edu/faqs.

“As a mandated reporter, I am obligated to report any information I become aware of regarding alleged acts of sexual discrimination, including sexual violence and dating violence. ASU Counseling Services, eooss.asu.edu/counseling, is available if you wish to discuss any concerns confidentially and privately.”

Statement on Inclusion

Arizona State University is deeply committed to positioning itself as one of the great new universities by seeking to build excellence, enhance access and have an impact on our community, state, nation and the world. To do that requires our faculty and staff to reflect the intellectual, ethnic and cultural diversity of our nation and world so that our students learn from the broadest perspectives, and we engage in the advancement of knowledge with the most inclusive understanding possible of the issues we are addressing through our scholarly activities. We recognize that race and gender historically have been markers of diversity in institutions of higher education. However, at ASU, we believe that diversity includes additional categories such as socioeconomic background, religion, sexual orientation, gender identity, age, disability, veteran status, nationality and intellectual perspective.

Syllabus Disclaimer

The course syllabus is an educational contract between the instructor and students. Every effort will be made to avoid changing the course schedule but the possibility exists that unforeseen events will make syllabus changes necessary. The instructor reserves the right to make changes to the syllabus as deemed necessary. Students will be notified in a timely manner of any syllabus changes via email, or in the Announcements section on Blackboard.

Campus Resources

There is clear evidence that students who take advantage of academic support services perform better academically. As an ASU student you have access to many resources on campus. This includes tutoring, academic success coaching, counseling services, financial aid, disability resources, career and internship help and many opportunities to get involved in student clubs and organizations.

- Tutoring: students.asu.edu/academic-success
- Counseling Services: students.asu.edu/counseling
- Financial Aid: students.asu.edu/financialaid
- Disability Resource Center: asu.edu/studentaffairs/ed/drc/
- Major/Career Exploration: uc.asu.edu/majorexploration/assessment
- Career Services: students.asu.edu/career
- Student Organizations: asu.edu/studentaffairs/mu/clubs/
- ASU Writing Centers: tutoring.asu.edu/writing-centers
- ASU Police Department: cfo.asu.edu/police
- International Student Resources: students.asu.edu/international/support/academic