

PHYS 320: ELECTRICITY AND MAGNETISM I

SYLLABUS (2014 Fall)

Department of Physics, Southern Illinois University–Carbondale

Last updated: August 18, 2014

1 General information:

Instructor: K. V. Shajesh

Office: Neckers 491, Tel.: +1-618-453-5212.

Email: shajesh@siu.edu

Web-page: <http://www.physics.siu.edu/~shajesh>

Class meetings: MWF 2:00-2:50PM, in Neckers 410.

Office hours: MWF 10:00-11:30PM, R 11:00AM-12:30PM.

2 Prerequisites:

Completed PHYS 203B or equivalent, and either completed or concurrently taking PHYS 301. An aptitude for abstract description of natural phenomena using mathematics will be necessary for the course. Familiarity with the following topics will be assumed: vectors, complex numbers, differential and integral calculus, matrices and determinants, eigenvalue problems, elementary differential equations. Exposure to Maxwell's equations in integral form will be assumed.

Completion of PHYS 205A, PHYS 205B, and MATH 251 with grade of C or better, and PHYS 301, or MATH 305, or concurrent enrollment, is an official prerequisite for the course.

3 Course description

Textbook

Introduction to Electrodynamics, 4th Edition, by David J. Griffiths.

The course will broadly cover the first seven chapters of the textbook. We will begin with an introduction to vector calculus. Maxwell's equations in differential form will be introduced early. Techniques to determine static electromagnetic fields (electrostatics and magnetostatics) in presence of charges and currents, dielectric and permeable materials, and conductors, will be introduced. Green's function will be introduced for this purpose and will form the central element of the course.

References

1. *Classical Electrodynamics*, by J. Schwinger, L. L. DeRaad, Jr., K. A. Milton, and Wu-yang Tsai.
2. *Electromagnetic Theory*, by J. A. Stratton.
3. *Classical Electrodynamics*, by J. D. Jackson.

Webpage

Relevant notes and homework will be posted at

<http://www.physics.siu.edu/~shajesh/tc/201408-SIU-P320/>.

4 Course work

Evaluation

Homework	30 %
Midterm Exams ($3 \times 15 \%$)	45 %
Final Exam	25 %

Homework

Homework will be assigned on a weekly basis at the course webpage. Students are encouraged to discuss homework problems with their classmates and anyone. But, each student should submit their own work describing detailed steps of thought process.

Exams

Four examinations (including the final exam) will be administered.

Midterm Exam 01	September 12 (Friday, in class)
Midterm Exam 02	October 10 (Friday, in class)
Midterm Exam 03	November 7 (Friday, in class)
Final Exam	December 10 (Wednesday, 2:00-3:45 PM)

The midterm exams will assess you on concepts covered in lectures and homework. You are expected to refer to the relevant content in the textbook and often find suitable references to strengthen your understanding of the topic. Midterm exams will be administered during the class hours, and will consist of four to five questions. All the midterm exams will be cumulative, but you are recommended to concentrate more on topics covered in the later part of the semester. The Final Exam will be similar to the Midterm Exam except it will be longer and cover the complete semester.

Grading

The grading will be done on a scale of 0-100. This raw score should be used to assess your knowledge in the subject. The raw score will be converted to the official score, that will be reported to the university, using the formula

$$(\text{Official Score}) = \frac{(\text{Raw Score})}{2} + 50. \quad (1)$$

For example, a Raw Score of 60 will lead to a Official Score of 80.

5 Syllabus Attachment

The Provost Office has created a “Syllabus Attachment” to assist the student. It lists and provides web links for many elements that are important for a student. Kindly find it attached.

"We emphasize student achievement and success because achievement and success are essential if we are to shape future leaders and transform lives." ¹

<http://pvcaa.siu.edu/>

IMPORTANT DATES *

<u>Semester Class Begins</u>	08/18/2014
<u>Last day to add a class</u> (without instructor permission):	08/24/2014
<u>Last day to withdraw completely and receive a 100% refund:</u>	08/31/2014
<u>Last day to drop a course using SalukiNet:</u>	10/26/2014
<u>Last day to file diploma application</u> (for name to appear in Commencement program):	10/31/2014
<u>Final examinations:</u>	12/8–12/12/2014

Note: For outreach, internet, and short course drop/add dates, visit

Registrar's Academic webpage <http://registrar.siu.edu/>

FALL SEMESTER HOLIDAYS

Labor Day 09/01/2014

Fall Break 10/11—10/14/2014

Veterans Day 11/11/2014

Thanksgiving Vacation 11/26—11/30/2014

WITHDRAWAL POLICY ~ Undergraduate only

Students who officially register for a session may not withdraw merely by the stopping of attendance. An official withdrawal form needs to be initiated by the student and processed by the University. For the proper procedures to follow when dropping courses and when withdrawing from the University, please visit <http://registrar.siu.edu/pdf/ugradcatalog1314.pdf>

INCOMPLETE POLICY~ Undergraduate only

An INC is assigned when, for reasons beyond their control, students engaged in passing work are unable to complete all class assignments. An INC must be changed to a completed grade within one semester following the term in which the course was taken, or *graduation*, whichever occurs first. Should the student fail to complete the course within the time period designated, that is, by no later than the end of the semester following the term in which the course was taken, or graduation, whichever occurs first, the incomplete will be converted to a grade of *F* and the grade will be computed in the student's grade point average. *For more information please visit:*

<http://registrar.siu.edu/grades/incomplete.html>

REPEAT POLICY

An undergraduate student may, for the purpose of raising a grade, enroll in a course for credit no more than two times (two total enrollments) unless otherwise noted in the course description. For students receiving a letter grade of A,B,C,D, or F, the course repetition must occur at Southern Illinois University Carbondale. Only the most recent (last) grade will be calculated in the overall GPA and count toward hours earned. *See full policy at*

<http://registrar.siu.edu/pdf/ugradcatalog1314.pdf>

GRADUATE POLICIES

Graduate policies often vary from Undergraduate policies. To view the applicable policies for graduate students, please visit

<http://gradschool.siu.edu/about-us/grad-catalog/index.html>

DISABILITY POLICY

Disability Support Services provides the required academic and programmatic support services to students with permanent and temporary disabilities. DSS provides centralized coordination and referral services. To utilize DSS services, students must come to the DSS to open cases. The process involves interviews, reviews of student-supplied documentation, and completion of Disability Accommodation Agreements.

<http://disabilityservices.siu.edu/>

PLAGIARISM CODE

http://pvcaa.siu.edu/_common/documents/Plagiarism/Guide%20to%20Preventing%20Plagiarism.pdf

SALUKI CARES

The purpose of Saluki Cares is to develop, facilitate and coordinate a university-wide program of care and support for students in any type of distress—physical, emotional, financial, or personal. By working closely with faculty, staff, students and their families, SIU will continue to display a culture of care and demonstrate to our students and their families that they are an important part of the community. For Information on Saluki Cares: (618) 453-5714, or siucares@siu.edu,

<http://salukicare.siu.edu/index.html>

EMERGENCY PROCEDURES

Southern Illinois University Carbondale is committed to providing a safe and healthy environment for study and work. We ask that you become familiar with the **SIU Emergency Response Plan** and **Building Emergency Response Team (BERT)** programs. Emergency response information is available on posters in buildings on campus, available on BERT's website at www.bert.siu.edu, Department of Safety's website at www.dps.siu.edu (disaster drop down) and the Emergency Response Guideline pamphlet. Instructors will provide guidance and direction to students in the classroom in the event of an emergency affecting your location. *It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency.*

INCLUSIVE EXCELLENCE

SIU contains people from all walks of life, from many different cultures and sub-cultures, and representing all strata of society, nationalities, ethnicities, lifestyles, and affiliations. Learning from and working with people who differ is an important part of education as well as an essential preparation for any career. *For more information please visit:* <http://www.inclusiveexcellence.siu.edu/>

MORRIS LIBRARY HOURS

<http://www.lib.siu.edu/about>

LEARNING AND SUPPORT SERVICES

Help is within reach. Learning support services offers free tutoring on campus and math labs. To find more information please visit the Center for Learning and Support Services website:

Tutoring : <http://tutoring.siu.edu/>

Math Labs http://tutoring.siu.edu/math_tutoring/index.html

WRITING CENTER

The Writing Center offers free tutoring services to all SIU students and faculty. To find a Center or Schedule an appointment please visit <http://write.siu.edu/>

AFFIRMATIVE ACTION & EQUAL OPPORTUNITY

Our office's main focus is to ensure that the university complies with federal and state equity policies and handles reporting and investigating of discrimination cases. *For more information visit:*

<http://diversity.siu.edu/#>

Additional Resources Available:

SALUKINET: <https://salukinet.siu.edu/cp/home/displaylogin>

ADVISEMENT: <http://advisement.siu.edu/>