



**FLORIDA  
ATLANTIC  
UNIVERSITY**

**COURSE CHANGE REQUEST  
Undergraduate Programs**

Department Physics  
College Science

UUPC Approval 3/27/23  
 UFS Approval \_\_\_\_\_  
 SCNS Submittal \_\_\_\_\_  
 Confirmed \_\_\_\_\_  
 Banner Posted \_\_\_\_\_  
 Catalog \_\_\_\_\_

**Current Course Prefix and Number** PHY 3323

**Current Course Title** Electromagnetism 1

*Syllabus must be attached for ANY changes to current course details. See [Template](#). Please consult and list departments that may be affected by the changes; attach documentation.*

**Change title to:**

**Change description to:**

**Change prefix**

**From:** \_\_\_\_\_ **To:** \_\_\_\_\_

**Change course number**

**From:** \_\_\_\_\_ **To:** \_\_\_\_\_

**Change credits\***

**From:** 4 **To:** 3

**Change grading**

**From:** \_\_\_\_\_ **To:** \_\_\_\_\_

**Change WAC/Gordon Rule status\*\***

Add  Remove

**Change General Education Requirements\*\*\***

Add  Remove

\*See [Definition of a Credit Hour](#).

\*\*WAC/Gordon Rule criteria must be indicated in syllabus and approval attached to this form. See [WAC Guidelines](#).

\*\*\*GE criteria must be indicated in syllabus and approval attached to this form. See [Intellectual Foundations Guidelines](#).

**Change prerequisites/minimum grades to:**

**Change corequisites to:**

**Change registration controls to:**

Please list existing and new pre/corequisites, specify AND or OR and include minimum passing grade (default is D-).

**Effective Term/Year for Changes:** Fall 2023

**Terminate course? Effective Term/Year for Termination:**

**Faculty Contact/Email/Phone** Korey Sorge / ksorge@fau.edu / 7-3380

**Approved by**

Department Chair \_\_\_\_\_

College Curriculum Chair \_\_\_\_\_

College Dean \_\_\_\_\_

UUPC Chair \_\_\_\_\_

Undergraduate Studies Dean \_\_\_\_\_

UFS President \_\_\_\_\_

Provost \_\_\_\_\_

**Date**

3/16/23

3-16-23

\_\_\_\_\_

3/27/23

3/27/23

\_\_\_\_\_

\_\_\_\_\_

Email this form and syllabus to [mjenning@fau.edu](mailto:mjenning@fau.edu) seven business days before the UUPC meeting.

**PHY 3323-001**  
**Electromagnetism 1**

TR 11:00 – 12:20  
3 credits

Semester, Year  
Prof. XXXXX YYYYY  
Office: XXXXX  
Office hours: MWF 11-12  
Classroom: XXXX  
Telephone: 561-297-XXXX  
Email: [zzzzz@fau.edu](mailto:zzzzz@fau.edu)



TA name	xxxxxx xxxxxxxxx
Office	xxxxxx
Office hours	MWF xx:xx – xx:xx
Telephone	561-297-xxxx
Email	xxxxxx@fau.edu

### **Catalog Description**

Study of dynamic fields and the unification of electric and magnetic phenomena. Emphasis on induction and radiation phenomena with applications to optics and relativistic electrodynamics.

### **Course Description**

This course is the first in a two-semester sequence on electromagnetic phenomena that focuses on statics. It begins with a review of vector calculus and mathematical methods. These tools are then used to develop techniques of finding electrostatic fields such as Coulomb's Law, Gauss's Law, and the Electric Potential. Special techniques for finding electric fields based on uniqueness conditions and approximation are developed. The course will also examine the interaction of electric fields with matter and discuss techniques for solving problems in the presence of media. Procedures such as the Biot-Savart Law, Ampere's Law, and Magnetic Vector Potential are developed for finding magnetostatic fields. An analysis of magnetic fields interacting with matter follows from this. The course concludes with an overview of how dynamics give a complete version of Maxwell's Equations.

### **Instructional Method**

In-Person: Traditional concept of in person. Mandatory attendance is at the discretion of the instructor.

### **Prerequisites / Corequisites**

Prerequisite: PHY 2049 and MAC 2313

## Course Objectives/Student Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Develop mathematical tools for the analysis of electromagnetic systems.
2. Evaluate proper coordinate spaces and mathematical techniques to directly integrate sources. These integrative techniques can be applied to fields, potentials and energies.
3. Assess proper arguments to apply symmetry and expansion techniques to solve problems in electromagnetism.
4. Develop the full time-dependent form of Maxwell's Equations in terms of electric and magnetic field.
5. Classify and analyze a range of electromagnetic devices.
6. Compose a set of tools to classify the interaction of electromagnetic fields with matter.

## Course Evaluation Method

- **Homework (25%)**
- **Three Exams (25% each)**

## Course Grading Scale

>94%	A
90-94%	A-
87-90%	B+
84-87%	B
80-84%	B-
77-80%	C+
74-77%	C
70-74%	C-
67-70%	D+
64-67%	D
60-64%	D-
<60%	F

## **Policy on Makeup Tests, Late Work, and Incompletes (if applicable)**

- **Policy on Late Homework:** I do not accept late homework submissions for credit. Submissions made late will still be graded as normal, but for no points. Technological problems are not a valid reason for late work. I suggest that you start early so that if there is a technical glitch, we can come up with a solution to work around it.
- **Poly on Late Exams:** Please note that you must have a genuine and valid reason for missing or taking a test at a later time. This could be something like surgery (with a doctor's note) or proof of jury duty. An excuse such as "I had a headache," or "my boss wanted me to work an extra shift" is unacceptable. The exam schedule is given. Valid reasons for missing the test must be given in advance. Not following this rule means that I don't have to reschedule a test for you.
- **Extra Credit:** I may designate certain homework problems or problems on exams as extra credit. This is the only extra credit in the course.

## **Classroom Etiquette Policy**

University policy on the use of electronic devices states: "In order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular telephones and pagers, are to be disabled in class sessions."

## **Policy on the Recording of Lectures (optional)**

Students enrolled in this course may record video or audio of class lectures for their own personal educational use. A class lecture is defined as a formal or methodical oral presentation as part of a university course intended to present information or teach students about a particular subject. Recording class activities other than class lectures, including but not limited to student presentations (whether individually or as part of a group), class discussion (except when incidental to and incorporated within a class lecture), labs, clinical presentations such as patient history, academic exercises involving student participation, test or examination administrations, field trips, and private conversations between students in the class or between a student and the lecturer, is prohibited. Recordings may not be used as a substitute for class participation or class attendance and may not be published or shared without the written consent of the faculty member. Failure to adhere to these requirements may constitute a violation of the University's Student Code of Conduct and/or the Code of Academic Integrity.

## **Attendance Policy**

*Students are expected to attend all of their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance. Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.*

## **Counseling and Psychological Services (CAPS) Center**

*Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to <http://www.fau.edu/counseling/>*

## **Disability Policy**

*In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at [www.fau.edu/sas/](http://www.fau.edu/sas/).*

## **Code of Academic Integrity**

*Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see [University Regulation 4.001](#).*

## **Required Texts/Readings**

- DJ Griffiths, “Introduction to Electromagnetism” (Fourth Edition)

## Course Topical Outline

<b>Dates</b>	<b>Topic</b>	<b>Assigned Reading</b>
Week 1	Vector Math and Differentiation	Chapter 1
Week 2	Vector Integration and Coordinate Systems	Chapter 1
Week 3	Coulomb's Law and the Biot-Savart Law	Chapters 2 and 5
Week 4	Gauss' Law and Ampere's Law	Chapter 2 and 5
Week 5	Review and Exam 1	
Week 6	Electric and Magnetic Potential	Chapter 2 and 5
Week 7	Expansion Techniques and Boundary Conditions	Chapter 2 and 3
Week 8	Faraday's Law and Maxwell's Equations	Chapter 7
Week 9	Review and Exam 2	
Weeks 10	Capacitance and Inductance	Chapter 2 and 7
Weeks 11	Mutual Induction and Magnetometry	Chapter 7
Week 12	Energy in Electric and Magnetic Systems	Chapter 2, 5 and 7
Week 13	Electric Materials	Chapter 4
Week 14	Magnetic Materials	Chapter 6
<b>Final Exam</b>		