PHYS 235: ADVANCED ELECTROMAGNETISM

In Workflow

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Approval Path

1. Fri, 13 Sep 2024 20:05:07 GMT
   Mikkel Jensen (mikkel.jensen): Approved for PHYS Committee Chair
2. Fri, 13 Sep 2024 20:05:16 GMT
   William DeGraffenreid (degraff): Approved for PHYS Chair
3. Wed, 02 Oct 2024 22:48:56 GMT
   Mikkel Jensen (mikkel.jensen): Approved for NSM College Committee Chair
4. Fri, 11 Oct 2024 18:35:39 GMT
   Chris Taylor (ctaylor): Approved for NSM Dean

New Course Proposal

Date Submitted: Wed, 11 Sep 2024 16:26:06 GMT

Viewing: PHYS 235 : Advanced Electromagnetism

Last edit: Wed, 02 Oct 2024 22:48:08 GMT

Changes proposed by: Rodolfo Barniol Duran (219696192)

Contact(s):

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Catalog Title:
Advanced Electromagnetism

Class Schedule Title:
Advanced Electromagnetism

Academic Group: (College)
NSM - Natural Sciences & Mathematics

Academic Organization: (Department)
Physics and Astronomy

Will this course be offered through the College of Continuing Education (CCE)?
No

Catalog Year Effective:
Fall 2025 (2025/2026 Catalog)

Subject Area: (prefix)
PHYS - Physics

Catalog Number: (course number)
235

Course ID: (For administrative use only.)
TBD

Units:
3

Is the ONLY purpose of this change to update the term typically offered or the enforcement of existing requisites at registration?
No

In what term(s) will this course typically be offered?
Spring term only

Does this course require a room for its final exam?
Yes, final exam requires a room

Does this course replace an existing experimental course?
No

This course complies with the credit hour policy:
Yes

Justification for course proposal:
Electromagnetism is a fundamental pillar of physics and as such this course acts as a "core" requirement of the MS Physics program. The purpose of this course is to first review the upper-division electromagnetism seen in undergraduate physics courses and then move on to advanced topics that appear in modern physics research.

Course Description: (Not to exceed 90 words and language should conform to catalog copy.)
Graduate level electromagnetism. Theoretical approaches in electromagnetics, including boundary-value problems in electrostatics and magnetostatics; Maxwell's equations; theory of dielectrics; theory of electric conduction; theory of magnetized matter.

Are one or more field trips required with this course?
No

Fee Course?
No

Is this course designated as Service Learning?
No

Is this course designated as Curricular Community Engaged Learning?
No

Does this course require safety training?
No

Does this course require personal protective equipment (PPE)?
No

Does this course have prerequisites?
Yes

Prerequisite:
PHYS 136, or instructor permission.

Prerequisites Enforced at Registration?
Yes

Does this course have corequisites?
No

Graded:
Letter

Approval required for enrollment?
No Approval Required

Course Component(s) and Classification(s):
Lecture

Lecture Classification
CS#02 - Lecture/Discussion (K-factor=1WTU per unit)

Lecture Units
3

Is this a paired course?
No

Is this course crosslisted?
No

Can this course be repeated for credit?
No

Can the course be taken for credit more than once during the same term?
No

Description of the Expected Learning Outcomes and Assessment Strategies:

List the Expected Learning Outcomes and their accompanying Assessment Strategies (e.g., portfolios, examinations, performances, pre-and post-tests, conferences with students, student papers). Click the plus sign to add a new row.

	Expected Learning Outcome	Assessment Strategies
1	Solve complex electromagnetic physical systems (such as conducting, dielectric and magnetic materials) using a variety of formalisms	-quizzes -homework assignments -midterm examinations -a final examination
2	Construct solutions for boundary-value problems that use advanced techniques in electrostatics and magnetostatics (e.g. as Green's function, integral and differential calculus)	-quizzes -homework assignments -midterm examinations -a final examination
3	Model dynamic and quasi-static fields in advanced electromagnetic problems (such as inductors, eddy currents and skin effect)	-quizzes -homework assignments -midterm examinations -a final examination
4	Describe electromagnetic waves as solutions of Maxwell's equations	-quizzes -homework assignments -midterm examinations -a final examination
5	Analyze the role that electromagnetism plays in current practical physical applications, for example wave guides, particle accelerators and antennae	-quizzes -homework assignments -midterm examinations -a final examination

Attach a list of the required/recommended course readings and activities:
PHYS 235 Advanced Electromagnetism.pdf

For whom is this course being developed?
Majors in the Dept

Is this course required in a degree program (major, minor, graduate degree, certificate?)

Yes

Has a corresponding Program Change been submitted to Workflow?

No

Identify the program(s) in which this course is required:

Programs:
MS in Physics

Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer)?

No

Will there be any departments affected by this proposed course?

No

I/we as the author(s) of this course proposal agree to provide a new or updated accessibility checklist to the Dean's office prior to the semester when this course is taught utilizing the changes proposed here.

I/we agree

University Learning Goals

Graduate (Masters) Learning Goals:

Disciplinary knowledge
Critical thinking/analysis

Is this course required as part of a teaching credential program, a single subject, or multiple subject waiver program (e.g., Liberal Studies, Biology) or other school personnel preparation program (e.g., School of Nursing)?

No

Is this a Graduate Writing Intensive (GWI) course?

No

Key: 14775