

Cover Sheet: Request 12364

EEL4473 Electromagnetic Fields and Applications 2

Info

Process	Course Modify Ugrad/Pro
Status	Pending at PV - University Curriculum Committee (UCC)
Submitter	Shannon Chillingworth schill@ece.ufl.edu
Created	2/28/2018 2:24:13 PM
Updated	4/4/2018 4:42:42 PM
Description of request	Update course title and description

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	ENG - Electrical and Computer Engineering 011905000	Robert Fox	Updating course title and description	2/28/2018
EEL4473_EM_Fields_UCC2_Syll.docx					2/28/2018
College	Approved	ENG - College of Engineering	Heidi Dublin	Approved by HWCOE Curriculum Committee 4/4	4/4/2018
No document changes					
University Curriculum Committee	Pending	PV - University Curriculum Committee (UCC)			4/4/2018
No document changes					
Statewide Course Numbering System					
No document changes					
Office of the Registrar					
No document changes					
Student Academic Support System					
No document changes					
Catalog					
No document changes					
College Notified					
No document changes					

Course|Modify for request 12364

Info

Request: EEL4473 Electromagnetic Fields and Applications 2

Description of request: Update course title and description

Submitter: Shannon Chillingworth schill@ece.ufl.edu

Created: 2/28/2018 2:20:10 PM

Form version: 1

Responses

Current Prefix EEL

Course Level 4

Number 473

Lab Code None

Course Title Electromagnetic Fields and Applications 2

Effective Term Earliest Available

Effective Year Earliest Available

Requested Action Other (selecting this option opens additional form fields below)

Change Course Prefix? No

Change Course Level? No

Change Course Number? No

Change Lab Code? No

Change Course Title? Yes

Current Course Title Electromagnetic Fields and Applications 2

Proposed Course Title Electromagnetic Fields and Applications

Change Transcript Title? Yes

Current Transcript Title ELECTROMAG FLDS 2

Proposed Transcript Title (21 char. max) ELECTROMAG FLDS apps

Change Credit Hours? No

Change Variable Credit? No

Change S/U Only? No

Change Contact Type? No

Change Rotating Topic Designation? No

Change Repeatable Credit? No

Maximum Repeatable Credits 0

Change Course Description? Yes

Current Course Description Maxwell's equations, electromagnetic wave propagation in different media, antennas, waveguides, numerical methods and electromagnetic coupling.

Proposed Course Description (50 words max) Rigorous development of fundamental electrostatic, magnetostatic, and electromagnetic behavior, with special attention toward practical applications.

Electrostatics: Gauss' law, electric fields, scalar potential, and energy in simple media. Magnetostatics:

Ampère's law, Faraday's law, magnetic fields, vector potential, and energy in simple media.
Electromagnetics: Maxwell's equations, time-varying fields, and Poynting's theorem.
Change Prerequisites? No

Change Co-requisites? No

Rationale Updated title and course description more accurately reflect course content.

Electromagnetic Fields and Applications

EEL 4473, section XXXX

Class Periods: TBD

Location: TBD

Academic Term: TBD

Instructor

- **Name:** Robert Moore
- **Email Address:** moore@ece.ufl.edu
- **Office:** NEB 557
- **Office Hours:** Friday 12:45-2:45 pm

Teaching Assistants

There are no teaching assistants for this course.

Course Description

(3 credits)

Rigorous development of fundamental electrostatic, magnetostatic, and electromagnetic behavior, with special attention toward practical applications. Electrostatics: Gauss' law, electric fields, scalar potential, and energy in simple media. Magnetostatics: Ampère's law, Faraday's law, magnetic fields, vector potential, and energy in simple media. Electromagnetics: Maxwell's equations, time-varying fields, and Poynting's theorem.

Course Pre-Requisites / Co-Requisites

EEL 3472C or equivalent

Course Objectives

Students will develop advanced skills in vector calculus and a physical intuition that are necessary for proper evaluation of electrical and magnetic systems. These include techniques to determine the resistance, capacitance, and inductance of non-trivial problems involving mixed-media and multiple conductors.

Required Textbook

- **Title:** Electromagnetic Fields (2nd edition)
- **Author:** Roald K. Wangsness
- **Publisher:** John Wiley & Sons, Inc.
- **ISBN:** 0-471-81186-6

Materials and Supply Fees

No additional course materials or supplies are needed.

Professional Component (ABET)

In contribution to meeting the professional components of an ABET-accredited degree, this course consists of 3 credits of Engineering Science.

Relation to Program Outcomes (ABET)

Engineering Criteria

- a - an ability to apply knowledge of mathematics, science, and engineering
- e - an ability to identify, formulate, and solve engineering problems
- g - an ability to communicate effectively

EE Program Criteria

- EE2 - knowledge of mathematics, basic and engineering sciences necessary to analyze and design complex systems
- EE3 - knowledge of advanced mathematics including linear algebra, complex variables and discrete mathematics

Course Schedule

Week 1:

Aug 21	Monday	Chapter 1, Vectors
Aug 23	Wednesday	Chapter 1, Vectors
Aug 25	Friday	Chapter 1, Vectors

Week 2:

Aug 28	Monday	Chapter 2, Coulomb's Law
Aug 30	Wednesday	Chapter 3, The Electric Field
Sep 1	Friday	Chapter 4, Gauss' Law

Week 3:

Sep 4	Monday	<i>Holiday (no class)</i>
Sep 6	Wednesday	Chapter 5, The Scalar Potential ----- Homework 1 due
Sep 8	Friday	Chapter 5, The Scalar Potential

Week 4:

Sep 11	Monday	Chapter 6, Conductors in Electrostatic Fields
Sep 13	Wednesday	Chapter 6, Conductors in Electrostatic Fields ----- Homework 2 due
Sep 15	Friday	Chapter 7, Electrostatic Energy

Week 5:

Sep 18	Monday	Chapter 8, Electric Multipoles
Sep 20	Wednesday	Chapter 8, Electric Multipoles ----- Homework 3 due
Sep 22	Friday	Chapter 9, Boundary Conditions at a Surface of Discontinuity

Week 6:

Sep 25	Monday	Chapter 10, Electrostatics in the Presence of Matter
Sep 27	Wednesday	Chapter 10, Electrostatics in the Presence of Matter Homework 4 due
Sep 29	Friday	Chapter 11, Special Methods in Electrostatics

Week 7:

Oct 2	Monday	Chapter 11, Special Methods in Electrostatics
Oct 4	Wednesday	Chapter 11, Special Methods in Electrostatics ----- Homework 5 due
Oct 6	Friday	<i>Homecoming (no class)</i>

Week 8:

Oct 9	Monday	Chapter 12, Electric Currents
Oct 11	Wednesday	Review of Chapters 1-12, and graduate seminar -- Homework 6 due
Oct 13	Friday	Review of Chapters 1-12, and graduate seminar

Week 9:

Oct 16	Monday	Exam 1 (Chapter 1-12)
Oct 18	Wednesday	Chapter 13, Ampère's Law
Oct 20	Friday	Chapter 14, The Magnetic Induction

Week 10:

Oct 23	Monday	Chapter 15, The Integral Form of Ampère's Law
Oct 25	Wednesday	Chapter 16, The Vector Potential ----- Homework 7 due
Oct 27	Friday	Chapter 17, Faraday's Law of Induction

Week 11:		
Oct 30	Monday	Chapter 17, Faraday's Law of Induction
Nov 1	Wednesday	Chapter 18, Magnetic Energy ----- Homework 8 due
Nov 3	Friday	Chapter 19, Magnetic Multipoles
Week 12:		
Nov 6	Monday	Chapter 19, Magnetic Multipoles
Nov 8	Wednesday	Chapter 20, Magnetism in the Presence of Matter -- Homework 9 due
Nov 10	Friday	<i>Holiday (no class)</i>
Week 13:		
Nov 13	Monday	Chapter 20, Magnetism in the Presence of Matter
Nov 15	Wednesday	Review of Chapters 13-20, and graduate seminar -- Homework 10 due
Nov 17	Friday	Review of Chapters 13-20, and graduate seminar
Week 14:		
Nov 20	Monday	Exam 2 (Chapters 13-20)
Nov 22	Wednesday	<i>Holiday (no class)</i>
Nov 24	Friday	<i>Holiday (no class)</i>
Week 15:		
Nov 27	Monday	Chapter 21, Maxwell's Equations
Nov 29	Wednesday	Chapter 21, Maxwell's Equations
Dec 1	Friday	Chapter 22, Scalar and Vector Potentials
Week 16:		
Dec 4	Monday	Chapter 24, Plane Waves
Dec 6	Wednesday	Chapter 24, Plane Waves ----- Homework 11 due
Dec 8	Friday	<i>Reading day (no class)</i>

Attendance Policy, Class Expectations, and Make-Up Policy

Attendance is not explicitly required; however, homework assignments must be turned in by the beginning of class on the day that they are due, and exams will be taken in-class. Laptops with all sounds disabled may be used in class, provided they do not distract other students. Requests to re-schedule an exam must be brought to the instructor's attention at least 1 week before the scheduled exam date. Excused absences are consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) and require appropriate documentation.

Evaluation of Grades:

A total of 11 homework assignments and 2 exams will be given throughout the semester. Homework assignments and exams will be graded primarily on the ability of the student to demonstrate they understand the relevant fundamental concepts. Significant credit will be given to:

- (1) The written setup of each assigned problem, including figures/diagrams when appropriate and a clear declaration of the problem statement (e.g., specifications, initial assumptions, problem goal, etc.);
- (2) A qualitative approach and methodology to the problem solution that demonstrates an understanding of the relevant physics.

Homework assignments are due at the **beginning of class**. Late homework assignments will be penalized by 15%, with an additional 15% for every additional late day.

For **undergraduate** students, the final grade will comprise a weighted mean of the homework and exam scores, with the set of homework assignments comprising 30% of the final grade, and each exam comprising 35% of the final grade.

Breakdown of **undergraduate** final grades

Assignment	Percentage of Final Grade
Homeworks (11)	30%
Exam 1	35%
Exam 2	35%

Note: This course is co-listed with the graduate class. Graduate students will be additionally required to present two seminar-style talks on academic publications in peer-reviewed journals– each graduate student will be assigned to give a talk during week 8 and week 13. Selected articles must be approved by the instructor at least 1 week prior to the assigned presentation time. Additionally, graduate students must submit a two-page summary report of their chosen article prior to their assigned presentation time. Seminar talks and summary reports will be graded based upon the student’s ability to convey the scientific/engineering context, merit, and significance of the journal article.

For **graduate** students, the final grade will comprise a weighted mean of the homework, seminar, and exam scores, with the set of homework assignments comprising 10% of the final grade, each seminar comprising 10% of the final grade, and each exam comprising 35% of the final grade.

Breakdown of **graduate** final grades

Assignment	Percentage of Final Grade
Homeworks (11)	10%
Seminar talk/report (2)	20%
Exam 1	35%
Exam 2	35%

Grading Policy:

Percent	Grade	Grade Points
90 - 100	A	4.00
87 - 89	B+	3.33
80 - 86	B	3.00
77 - 79	C+	2.33
70 - 76	C	2.00
67 - 69	D+	1.33
60 - 66	D	1.00
0 - 59	E	0.00

In order to graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better).

More information on UF grading policy may be found at:
<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu/evals>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Software Use

All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Campus Resources:

Health and Wellness

U Matter, We Care:

If you or a friend is in distress, please contact umatter@ufl.edu or 352-392-1575 so that a team member can reach out to the student.

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
<https://lss.at.ufl.edu/help.shtml>.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.ufl.edu/>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.
<https://teachingcenter.ufl.edu/>.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
<https://writing.ufl.edu/writing-studio/>.

Student Complaints Campus: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaint-process>.