



JOINT INSTITUTE  
交大密西根学院

## Course Profile

Degree Program:

- ☒ ECE-Electrical & Computer Engineering  
☐ ME -Mechanical Engineering  
☐ General Courses for Both ECE & ME Degree Programs

Course Name: Electromagnetics I

Course Code: VE230

Course Credits: 4.0

Course Category: ☒ Required ☐ Elective

Terms Offered:

☒ Fall 2018-2019

Course Pre/Co-requisites:

Vv255 or Vv285, Vp240 (or Vp260), Ve215

Textbook: (Reference Books could also be listed here)

- Field and Electromagnetics(2nd Edition): **David K. Cheng**
- Introduction to Electrodynamics(3rd Edition): **David J.Griffiths**
- Fundamentals of Applied Electromagnetics (5th): **Fawwaz T. Ulaby**
- Electricity and Magnetism(3rd Edition): **Edward M. Purcell, David J. Morin**

Instructors:

MESLI Abdelmadjid: mesli@sjtu.edu.cn

Office Hours: Tuesday 10:00-12:00, Room 435C, JI Building

Teaching Assistants:

CHEN Ychen : Choly1234@sjtu.edu.cn

SUN Shangquan: 527112517@sjtu.edu.cn

Office Hours:

SUN Shangquan: Tuesday 18.00 – 20.00

CHEN Ychen: Thursday 18.00 – 20.00

Recitation classes:

SUN Shangquan: Monday 18.20 – 20.00

CHEN Ychen: Wednesday 18:20 – 20:00



## Grading Policy:

- Ve230 offers a number of assignments which will not be graded but corrected in recitation classes
- Between – 6 and 8 in-class quizzes (20%)
- 2 midterms (25% each)
- Final (30%)

**Academic Integrity:** (Any types of honor code regulations like class rules, homework policy, exam rules or project collaboration policy could be defined here)

- Problem sets (homework assignments) may be done with partners, but I believe that you do not fully understand the technical material unless you work on enough problems by yourself.
- Exams will be given under the JI's Honor Code and will require individual efforts. The exams will be closed book. Scientific calculators can be used for the exams. The use of other electronic devices such as electronic dictionary and cell phone during exams will constitute an Honor Code violation. If you miss an exam, real documentation is required stating why you could not attend (severe disease, for example).

## Course Objectives

To teach the fundamental principles in electromagnetism with a special emphasis on understanding rather than simply learning. The instructor will put a major focus on understanding the concepts sustaining such fundamental principles.

The instructor will be carrying live questions (a kind of oral quiz) along with lectures. The objective is to initiate permanent exchanges and interactions with the students to improve the process of understanding.

The recitations classes conducted by the TA's are of fundamental importance to complete the understanding of difficult concepts.

## Course description and detailed teaching schedules:

**Course Description:** Vector calculus; Electrostatics; Magnetostatics; Energy and elementary circuits; Maxwell's equations; Plane waves.

### Tentative Teaching Schedule:

Week	Lecture Topics	Homework
1	Lecture 1. General consideration and learning versus understanding	
	Lecture 2. Introduction I: General overview of electromagnetism	HW1
2	Lecture 3. Introduction II: Defining concepts and principles	
	Lecture 4. Position of the problem and Vector Analysis I	
	Lecture 5. Vector Analysis II	HW2
3	Lecture 6. Static Electric Fields: Gauss law and applications	HW3
	Lecture 7. Static Electric Fields: Dipole	
4	Lecture 8. Static Electric Fields: Conductor	HW4
	Lecture 9. Static Electric Fields: Dielectric I	
	No lecture, Midterm Exam I	
5	Lecture 10. Static Electric Fields: Dielectric II	HW5



	Lecture 11. Static Electric Fields: Electrostatic energy, work and force	
6	Lecture 12. Steady Electric Currents: Ohm's and Kirchhof's law	
	Lecture 13. Steady Electric Currents: Joule's law	HW6
	Lecture 14. Magnetostatics I: Basic of magnetic field force and its applications	
7	Lecture 15. Magnetostatics II: Ampere's law and its applications	HW7
	Lecture 16. Magnetostatics III: Vector potential and its applications	
8	Lecture 17. Magnetostatics IV: Faraday's emf induction	HW8
	Lecture 18. Static Magnetic Fields: Electrostatic versus magnetostatics	
	No lecture, Midterm Exam 2	
9	Lecture 19. Maxwell's Equations I: Electromagnetic waves	
	Lecture 20. Solving Maxwell's equations in free space	
10	Lecture 21. Solving Maxwell's equations with current and charges	HW9
	Lecture 22. Plane Electromagnetic Waves I	
	Lecture 23. Plane Electromagnetic Waves II	
11	Lecture 24. Plane Electromagnetic Waves III	
	Lecture 25. Plane Electromagnetic Waves IV	HW10
12	Lecture 26. Plane Electromagnetic Waves V	
	Review I	
	Review II	
13	No lecture, Final Exam	

