



Course Syllabus

VE530

Electricity and Magnetism

Fall 2018

- **Course Description:** Maxwell's equations, constitutive relations and boundary conditions. Potentials and the representation of electromagnetic fields. Uniqueness, duality, equivalence, reciprocity and Babinet's theorems. Plane, cylindrical, and spherical waves, Dyadic Green's function. Waveguides and elementary antennas.
- **Instructor:**
Name: Sung-Liang Chen
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Phone: 13120958820
Office: Room 428
Office hour: Tue 1:00-2:00; Wed 1:00-2:00
- **Textbook** (Author, Book Title, Publisher, Publication Year, ISBN): **J. A. Kong, Electromagnetic Wave Theory, EM W Publishing, 1986**
- **Course Prerequisites:** VE230
- **Course Website:** none.
- **Grading Policy** (Assignments %, Project, Exams, etc.): **Homework 25%; Midterm#1 20%; Midterm#2 20%; Final exam 25%; Presentation 10%**



- **Honor Code Policy:** <http://umji.sjtu.edu.cn/honorcode/>
- **Teaching Schedule:**

Week	NO.	Date	lectures and Exams	Comments
1	1	9/10	Introduction, Lecture 1, Lecture2(1/2)	
	2	9/12	Lecture2(2/2), Lecture3(1/2)	
2	3	9/17	Lecture3(2/2), Lecture4	
	4	9/19	Lecture5	
3	5	9/24	No Lecture, Moon Festival	
	6	9/26	Lecture6	
4	7		National holiday	
	8		National holiday	
5	9	10/8	Lecture7, Lecture 8(1/2)	
	10	10/10	Lecture8(2/2), Lecture9	
6	11	10/15	Midterm Exam 1	
	12	10/17	Lecture10	
7	13	10/22	Lecture11, Lecture12(1/2)	
	14	10/24	Lecture12(2/2)	
8	15	10/29	Lecture13	
	16	10/31	Lecture14	
9	17	11/5	Lecture15	
	18	11/7	Lecture16(1/2)	
10	19	11/12	Midterm Exam 2	
	20	11/14	Lecture16(2/2), Lecture17(1/2)	
11	21	11/19	Lecture17(2/2)	
	22	11/21	Lecture18(1/2)	
12	23	11/26	Lecture18(2/2), Lecture19(1/3)	
	24	11/28	Lecture19(2/3)	
13	25	12/3	Lecture19(3/3)	
	26	12/5	Presentations	
14	27	12/10	Final exam	
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- Lecture1: The Field Equations
- Lecture2: Integral form of Maxwell's equations and time-varying surfaces
- Lecture3: Constitutive Relations: Macroscopic Properties of Matter
- Lecture4: Boundary Conditions
- Lecture5: Generalized Coordinates

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- Lecture6: Equivalent Magnetic Charge and Current
- Lecture7: Flow of Energy
- Lecture8: The Electromagnetic Potentials
- Lecture9: Radiated Field from an Infinitesimal Current Element
- Lecture10: Time-Harmonic Electromagnetic Waves
- Lecture11: Formal Solution of Helmholtz Equation
- Lecture12: Solution of Helmholtz Equation for a Complex Medium
- Lecture13: Plane-Wave Propagation in Homogeneous Media
- Lecture14: Transverse Electric (TE) and Transverse Magnetic (TM) Field Solution of Helmholtz Equation
- Lecture15: Dielectric Coated Conductor
- Lecture16: Modal Expansion of Field Quantities
- Lecture17: Wave Functions in Cylindrical Coordinate System
- Lecture18: Scattering From a Metallic Circular Cylinder
- Lecture19: Wave Functions in Spherical Coordinate System



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