

EE 214000 Electromagnetics

Spring 2011

Information Sheet

Lecturer: Prof. Shang-Da Yang (楊尚達)
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Email: shangda@ee.nthu.edu.tw
Course website: <http://www.ee.nthu.edu.tw/~sdyang/Courses/EM.htm>
Class time: M3M4, W2
Office hours: Wednesday 10-11 AM, EECS 512
Head of TAs: 許呈韶, okelddo@gmail.com, Tel: 0911-682-138, NTHU ext. 34177
TA hours: Monday 7-9 PM, R118, Engineering Building III (工程三館 118)

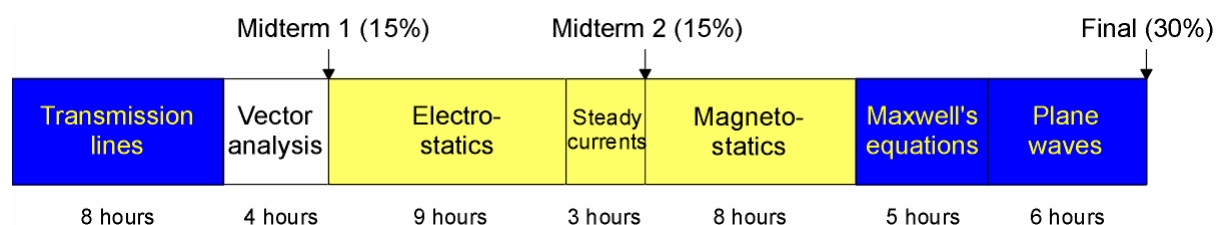
■ Textbooks & References

David K. Cheng, *Field and Wave Electromagnetics*, 2nd edition, Addison Wesley, 1989.

Shang-Da Yang, *Lecture Notes*, pdf files are available on the course website.

Umran S. Inan, and Aziz S. Inan, *Engineering Electromagnetics*, Addison Wesley, 1999.

■ Syllabus:



1. Introduction & transmission lines (8 hours: 2/21, 2/23, 2/28 和平紀念日, 3/2, 3/7, 3/9, 3/14)
2. Vector analysis (4 hours: 3/14, 3/16, 3/21)

3. Midterm exam 1 (3/28 evening)
4. Electrostatics in free space (3 hours: 3/23, 3/28)
5. Electrostatics in materials (3 hours: , 3/30, 4/4 校際活動週, 4/6, 4/11)
6. Capacitance, electrostatic energy (3 hours: 4/11, 4/13, 4/18)
7. Static electric currents (3 hours: 4/18, 4/20, 4/25, the 2nd hour of 4/25 as reservation)
8. Midterm exam 2 (5/2)
9. Magnetostatics in free space (3 hours: 4/27, 5/4 遇 CLEO 停課, 5/9)
10. Magnetostatics in materials (3 hours: 5/11, 5/16)
11. Inductance, magnetostatic energy (2 hours: 5/18, 5/23)
12. Introduction to Maxwell's equations (2 hours: 5/23, 5/25)
13. Wave equations (3 hours: 5/30, 6/1)
14. Plane waves (6 hours: 6/6, 6/8, 6/13, 6/15)
15. Final exam (6/20)

■ Grading Policies:

1. Homework (20%): Once in every two lessons. Delayed submission will not be counted.
2. Quizzes (20%): Irregular, but will be announced in advance. Questions will come from examples of textbook or homework questions.
3. Midterm exam 1 (15%): Tentatively scheduled on 3/28 (evening), covering transmission lines and vector analysis.
4. Midterm exam 2 (15%): Tentatively scheduled on 5/2 (class hours), covering electrostatics and static currents.
5. Final exam (30%): Tentatively scheduled on 6/20, covering magnetostatics, and electro-magnetodynamics.
6. Bonus points: Properly answering one bonus question in class may earn 1-3 points of semester score. Presence & thinking are encouraged.

■ Special Comments:

1. This course is most appropriate for those who have taken circuit theory, ordinary and partial differential equations, and Fourier transforms.
2. Capability of using math software (e.g. **Matlab**) is necessary in homework assignments.
3. Exam questions about transmission lines will solely come from lecture notes and homework, tracing the related chapters of the textbook is frustrating and unnecessary.
4. The purpose of this course is to “**reorganize**” your existing knowledge about electromagnetics in a systematic manner. Starting from the four fundamental postulates (Maxwell’s equations), all experimental laws can be placed under a united hierarchy.
5. The textbook is well written and worth reading line by line. The lecture notes are designed to summarize the key topics with minimal number of examples, which can be used as a guideline of studying. Examining **more examples** from the textbook by yourself is strongly recommended.
6. Some of important topics will be investigated in homework for lack of lecture time. They will be present in quizzes and exams.
7. The homework questions will be **less complicated** than those of the previous years. You are not supposed to solve them perfectly, however, practicing them **independently** is essential to consolidate your understanding.
8. There are too many formulas in electromagnetics, and repeating them from memory does not help in the long term. The key to success is “**visualizing**” the formulas, which relies on understanding of vector analysis.
9. One can hardly expect to get familiar with Electromagnetics within one semester. You are encouraged to review it again and again. The same line may impress you with different meanings in successive times of reviewing.