

PME 3212 (2021 Fall)

電磁學 Electromagnetics

Lecture Time: W5W6W7

Lecture Room: 工程一館 Rm TBA

Instructor: 葉哲良 J. Andrew Yeh

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Prerequisite: Engineering Mathematics and Physics

Course Content:

- (1) Introduction to Electromagnetics
- (2) The Electromagnetic Model
- (3) Vector Analysis
- (4) Static Electric Fields
- (5) Steady Electric Current
- (6) Static Magnetic Fields
- (7) Time-Varying Fields and Maxwell's Equations
- (8) Applications of Static Fields
- (9) Simulation Tool Lecture using ANSYS/ANSOFT

Grading:

- (1) Pre-assignment & Homework: ~%
- (2) Exam: ~% (prelims, final, simulation and project)
- (3) Revised pre-assignment and homework will be included in Exam.
- (4) Attempt to reform the course format: ~%
 - Technical essay for open sharing and evaluation by participants
 - Technical notes for open discussion by participants

Notes Draft will be provided by TA.

Course Tools

- (1) EM simulator: ANSYS Maxwell EM (licensed version, server supported)
- (2) Hand-on Labs (optional)
- (3) Flat Panel/NB: lecture use.

Course Materials

- (1) Textbook
- (2) Course Notes
- (3) Handout

Textbook:

- (1) Chapters 1-7, Field and Wave Electromagnetics 2nd Ed., David K. Cheng, 1989 (1992 reprint), Addison Wesley

Reference:

- (1) Chapters 1-10, Engineering Electromagnetics, W. H. Hayt & J. A. Buck, 2001, McGraw-Hill (more content)
- (2) Chapter 6, Electromagnetic Field Theory Fundamentals, Guru & Hirizoglu, 1998, PWS (similar to previous one by D. K. Cheng)
- (3) Chapters 1-6, Introduction to Electrodynamics, D. J. Griffith, 1999, Prentice Hall (used in Department of Physics)
- (4) Chapters 1-2, Electromagnetics with Applications, J. Kraus & D. Fleisch, 1999 (more focus on wave propagation)
- (5) Chapters 1 - 6, Fundamentals of Engineering Electromagnetics, D. K. Cheng, 1993, Prentice Hall (easier version)

Remarks:

- (1) The course content will be similar to that offered at EE Department with additional case study particularly for PME students.
- (2) wk1 – 2021/09/15, wk16 – 2021/12/29
- (3) 停課： 2021/11/17 (全校運動會)
- (4) Exams (estimated to be 4 times): by chapter (date subjected to be changed)
2021/10/06 wk 4 (in class or at night) – Vector Analysis
2021/11/24 wk 11 (in class or at night) – Static Electric Fields
2021/12/15 wk 14 (in class or at night) – Steady Electric Current
2022/01/12 wk 18 (in class) – Static Magnetic Fields and the rest taught
- (5) Pizza Hour: 2022/01/05 (wk 17)