

# ECE 835: Advanced Electromagnetic Fields and Waves I

## Fall 2015

10:20 – 11:40 TuTh 2205 Engineering Building

Instructor: Ed Rothwell  
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Office Hours: TuTh 9:10-10:00, 2234 EB (EM lab)

Text: R.F. Harrington, Time-Harmonic Electromagnetic Fields, IEEE Press, 2001.  
Primary reference: E.J. Rothwell and M.J. Cloud, Electromagnetics, 2<sup>nd</sup> ed., CRC Press, 2008.

Course web site: MSU D2L system (<https://d2l.msu.edu/>)  
Class Notes: Dennis P. Nyquist, ECE 835 Class notes. Available on D2L.

Grading: Homework: 25%  
Midterm exam: 25%  
Final Exam: 50%

Assumed background: Exposure to electromagnetics (undergraduate physics), mathematical maturity (calculus, differential equations, vector calculus)

Policy on collaboration: Students are encouraged to work together on homework assignments. However, each student should turn in a separate homework solution. Photocopies are not allowed.

Suggested References (on reserve at the Main Library 1<sup>st</sup> floor circulation desk):

J.A. Stratton, Electromagnetic Theory, McGraw-Hill, 1941.  
C.A. Balanis, Advanced Engineering Electromagnetics, Wiley, 1989.  
S. Ramo, et.al., Fields and Waves in Communication Electronics, Wiley, 1994.  
J.A. Kong, Electromagnetic Wave Theory, Wiley, 1990.  
D.H. Staelin, et. al., Electromagnetic Waves, Prentice Hall, 1994.

Course Outline -----

<u>TOPIC</u>	<u>TEXT PAGES</u>
Fundamental Concepts	1-36
Introduction to Waves	37-94
Some Theorems and Concepts	95-142
Plane Wave Functions	143-197

Midterm exam (tentative): October 29, 2015 (in class)  
Final exam: Friday, December 18, 2015, 7:45-9:45 am.