

GENERAL COURSE INFORMATION:

**ADVANCED
ELECTROMAGNETIC THEORY
Part a**

Spring semester of 2018

**EE 570a – Lec 30788R & 30998D
Dis 30958R & 30985R**

Welcome to ADVANCED ELECTROMAGNETIC THEORY, Part a, the first part of an advanced course on applied electromagnetics. This course has 30 lectures, 15 discussion sessions, 13 homeworks, 1 midterm exam, and one final exam. Below are relevant information concerning this course; feel free to clarify any additional points that you may have directly with the instructor.

Prerequisite: EE 470 or equivalent;

Credit: 3 units;

Instructor: Prof. Aluizio Prata, Jr. [office: PHE 618;
tel: (213) 740-4704; email: prata@usc.edu];

Grader: Ahmed Morsy (office: VHE 309; email: morsy@usc.edu);

Text: Class notes and (loosely followed) Constantine Balanis,
Advanced Engineering Electromagnetics, second edition
(ISBN 978-0-470-58948-9);

Lectures: Tuesday and Thursday 09:30 – 10:50 in OHE 120;

Discussion: Friday 8:00 – 9:50 in OHE 136;

Instructor Office Hours: Tuesday and Thursday,
11:00 to 11:45 and 14:00 to 15:15;

Grader Office Hours: By appointment

Material covered and homework schedule:

Week #	HWK # and due date	Material Covered
1		Maxwell's Equations. Constitutive parameters.
2		Magnetic charges and currents. Impressed, induced, and displacement currents. Duality principle. Boundary conditions.
3	HWK 01, Jan, 25, Thursday	Conductors immersed in static fields. Conductors immersed in time-varying fields. Time-harmonic electromagnetic fields.
4	HWK 02, Feb. 01, Thursday	Power and energy in an electromagnetic field.
5	HWK 03, Feb. 08, Thursday	Electric and magnetic properties of matter.
6	HWK 04, Feb, 15, Thursday	Wave equation and its solution in Cartesian coordinates.
7	HWK 05, Feb. 22, Thursday	Wave equation and its solution in cylindrical and spherical coordinates.
8	HWK 06, Mar. 01, Thursday	Plane wave propagation. Wave polarization.
9	HWK 07, Mar. 08, Thursday	Polarization loss factor. Non-uniform plane waves.
10	HWK 08, Mar. 22, Thursday	Reflection and transmission of plane waves.
11	HWK 09, Mar. 29, Thursday	Plane waves at multiple interfaces.
12	HWK 10, Apr. 05, Thursday	Solving Maxwell's equations using potentials. Geometries in Cartesian coordinates.

13	HWK 11, Apr. 12, Thursday	Geometries in Cylindrical coordinates. Geometries in Spherical coordinates.
14	HWK 12, Apr. 19, Thursday	Space as a spherical waveguide.
15	HWK 13, Apr. 26, Thursday	Electromagnetic radiation.

The homework is due *at the beginning* of the corresponding lecture, on the due date. No late homeworks are accepted.

Exam schedule:

Exam	Date	Time	Location	Material Covered
Midterm	Fri., Mar. 23	08:00–08:50	OHE 136	Assignments 1–8
Final	Tue., May 08	08:00–10:00	OHE 120	All course material

All exams are of the closed-book type. The only books allowed during the exams are mathematics books, and your own class notes and homework solutions. You may also use a calculator. You are responsible for all material covered in class, on the assigned readings, and on the homework problems.

You must take the exams at the scheduled times. If you are absent during an exam, you will receive a zero grade unless you have a valid reason for your absence, *and* you have discussed it with Prof. Prata *prior* to the exam. Bring your USC ID card to each exam; it may be checked during the exam.

For information on policies regarding academic conduct and assistance for students with disabilities please consult the web site <http://ee.usc.edu/sacss> .

Grading Policy: The final grade of the course is computed using an weighted average of the midterm exam (with 35% weight), the final exam (with 45% weight), and of the thirteen homeworks (their average weighted by 20%).