

ENGR-342: Electromagnetic Fields and Waves

Spring Semester 2009, 4 credits

- Instructor** Dr. Greg Mowry (Greg)
- Contact** Office: OSS-106A, E-mail: gsmowry@stthomas.edu
Office hours: Open door or by appointment
- Time** Lecture MWF, 1:35 PM – 2:40 PM
- Location** OWS-275
- Required** “Fundamentals of Engineering Electromagnetics” by David K. Cheng, Addison Wesley Longman, ISBN-13 978020156616 or ISBN 0-201-56611-7.

“Div, Grad, Curl, and all that” by H. M. Schey. Norton.
- Suggested Supplements** “Electromagnetics Explained,” Ron Schmitt, Newnes – EDN bookstore, 2002.
“Introduction to Electrodynamics,” David J. Griffiths, 3/e, Prentice-Hall, NJ, 1999.
- Course Description** A continuation of PHYS 341. An introduction to the practical consequences of Maxwell’s equations including propagation, reflection and absorption of electromagnetic waves. Applications include antennas, waveguides, transmission lines, and shielding from electromagnetic interference.
- Prerequisites** PHYS 341
- Course Objectives and Outcomes** Understand the principles of E&M dynamics as demonstrated by exams, homework, etc.
Upon successful completion of the course, the student will be able to:
- Knowledge:
- Explain & use vector calculus in E&M applications (EE8,9)
 - Explain & use the scalar wave equation with applications involving plane waves (EE8,9)
 - Explain the fundamental concepts of waveguides and resonators (EE8,9,10)
 - Explain the fundamental concepts of antenna theory (EE8,9,10)
- Attitudes:
- Exhibit concern for the safety of themselves and others, (EE13)
 - Exhibit efficient use of time and resources, (EE13)
 - Exhibit courtesy to classmates, faculty and staff, (EE13)
 - Exhibit personal integrity, (EE13)
 - Exhibit desire for clear communication, (EE12)
 - Exhibit desire to learn, to achieve, and to participate.
- Course Methodology** **The instructor will facilitate learning via lecture and discussion. Class participation is required. Assignments are expected to be handed in on time. No late assignments accepted. Reading and comprehending the text is absolutely required.**

ENGR-342 Schedule					
Week	Week	Topics	Chapters	Other	Exams
1	2 Feb	Div, Grad Curl		<u>Project</u>	<u>Discussed</u>
2	9 Feb	Div, Grad Curl			E1
3	16 Feb	Dynamic Fields	C6		
4	23 Feb	Dynamic Fields	C6		E2
5	2 Mar	Plane Waves	C7		
6	9 Mar	Plane Waves	C7		
7	16 Mar	Plane Waves	C7	<u>Project</u>	<u>Defined; E3</u>
8	23 Mar	Spring Break	xxxxx	Have Fun	☺
9	30 Mar	TLs	C8		
10	6 & 8 Apr	TLs	C8	Easter Break on	Friday
11	15 & 17 Apr	TLs	C8	Easter Break on	Monday
12	20 Apr	TLs	C8		E4
13	27 Apr	Antennas	C10		
14	4 May	Antennas	C10		
15	11 May	Antennas	C10		E5
16	18 May	Finals			<u>Project due</u>

Portfolio Your portfolio will include your homework, class notes, exams and any other material related to the class. Please put your solutions in numerical order. The portfolio must use a 3-ring binder and be organized with dividers and a table of contents. The portfolio is due at the end of the semester and will be graded on the basis of organization, readability and correctness of selected problem solutions. Use only one side of each page in your portfolio material. Your portfolio will also include a minimum of a 2-page typed write-up explaining how your work demonstrates completion of course outcomes.

Points 4 exams & project 100 points each for a total of 500 points
 Homework Recommended problems and solutions will be given during lecture. Lecture problems will be assigned and must be handed in each week.
 Portfolio Overall completeness will be assessed. The portfolio = 50 points.

Total graded points = sum of above ~ 800 points = exams + portfolio + Lecture problems

Grading Policy 95 – 100% A **Note: there is no ‘curve’ for grading**
 90 – 94% A-
 85 – 89% B+
 80 – 84% B
 75 – 79% B-
 70 – 74% C Let’s not go beyond this point

Related Course Physics 341 – Electricity and Magnetism

Study Habits Electromagnetics is a very exciting field of study with many applications. The easiest way to learn the material is to study a bit every day. I strongly urge the following study pattern: Read 3 – 4 pages of material each day. Spend 15 minutes after each lecture reviewing the lecture material – ask questions if you do not understand the material. Work at least one suggested homework problem each day. This will take about an hour per day. This type of study pattern will help you learn the material and save you much wear-n-tear before exams.

Academic Integrity All students are expected to understand and follow University of St. Thomas policies on Academic Integrity. These are described at:
http://www.stthomas.edu/policies/student_policy_book/Academic_rights_and_procedures.asp

Attendance Policy **Students are expected to attend all class sessions. Circumstances which prevent attendance will be honored up to two instances. Absences in excess of two times may result in an incomplete grade for the course. Contact the instructor when a special situation arises. All absences require that the instructor be informed in advance.**

Instructor Biography See <http://www.stthomas.edu/engineering/faculty/gsmowry.htm>

Qualified students with documented disabilities who may need classroom accommodations should make an appointment with the Enhancement Program – Disability Services office during the first two weeks of the term. Telephone appointments are available to students as needed. Appointments can be made by calling 651-962-6315 or 800-328-6819, extension 6315. You may also make an appointment in person in O’Shaughnessy Educational Center, room 119. For further information, you can locate the Enhancement Program on the web at <http://www.stthomas.edu/enhancementprog/>.

Classroom accommodations will be provided for qualified students with documented disabilities. Students are invited to contact the Enhancement Program – Disability Services about accommodations for this course within the first two weeks of the term. Telephone appointments are available to students as needed. Appointments can be made by calling 651-962-6315 or 800-328-6819, extension 6315. You may also make an appointment in person in O’Shaughnessy Educational Center, room 119. For further information, you can locate the Enhancement Program on the web at <http://www.stthomas.edu/enhancementprog/>.

In compliance with the University of St. Thomas policy and disability laws, I am available to discuss academic accommodations that you may require as a student with a disability. Students are encouraged to register with the Enhancement Program-Disability Services office for disability verification and for determination of academic accommodations. Please do so within the first two weeks of the term. Appointments can be made by calling 651-962-6315 or 800-328-6819, extension 6315. Telephone appointments are available as needed. You may also make an appointment in O’Shaughnessy Educational Center, room 119. For further information, you can locate the Enhancement Program on the web at <http://www.stthomas.edu/enhancementprog/>.