Electromagnetic Field Theory EEEN 3310
Electrical Engineering
Fall 2018

A. COURSE INFORMATION

Course number/section: EEEN 3310.001
Class meeting time: 11:00 – 12:15 PM T, TH
Class location: EL-111
Course Website: https://bb9.tamucc.edu/webapps/login/

B. INSTRUCTOR INFORMATION

Instructor: Jose Baca
Office location: EN 222B
Office hours: 2:00–4:00 pm, T, W, TH; others as available or by appt.
E-mail: jose.baca@tamucc.edu
Appointments: Direct contact or e-mail

C. COURSE DESCRIPTION

Catalog Course Description
(3 sem. hrs. 3:0) An introduction to the theory of static and dynamic electromagnetic fields with a focus on engineering applications. Principles will be illustrated with applications in various areas.

Extended Course Description
This course is an introduction to electromagnetic theory. Some of the topics to be covered are Coulomb’s law, Gauss’s law, energy and potential, conductors and dielectrics, capacitance, magnetic field, forces, materials and inductance, Maxwell’s equations, transmission lines, uniform plane wave, plane wave reflection and dispersion, guided waves, electromagnetic radiation and antennas.

D. PREREQUISITES AND COREQUISITES

Prerequisites
• PHYS2426
• MATH2415
• MATH3315
• EEEN3315

Corequisites
• None.
E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Optional Textbook(s) or Other References: None
Supplies: None.

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

- Perform mathematical operations and solve problems using vectors and vector calculus.
- Understand electrostatic principles and solve basic electrostatic problems.
- Understand magnetostatic principles and solve basic magnetostatic problems.
- Describe and analyze electromagnetic wave propagation.
- Describe and analyze transmission lines and associated problems.
- Understand the basics of waveguides and their applications.
- Understand the basics of antennas and their various forms.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

Course will be based primarily on lectures, assignments, two midterms and final exam. Assignments will be given to review learning progress in general.

H. MAJOR COURSE REQUIREMENTS AND GRADING

Assignments will be given and collected for grading. Assignments will be given to evaluate progress, and these will be worth 50% of the final course grade. Midterm exam 1 and exam 2 will count 15% each of the final course grade. The comprehensive final exam will count for 20% of the final course grade.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
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<tbody>
<tr>
<td>Assignments</td>
<td>50</td>
</tr>
<tr>
<td>Midterm Exam 1</td>
<td>15</td>
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<tr>
<td>Midterm Exam 2</td>
<td>15</td>
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<td>Final Exam</td>
<td>20</td>
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I. **COURSE CONTENT/SCHEDULE**

(Dates for exams are tentative, subject to change)

<table>
<thead>
<tr>
<th>DATE (BY WEEK)</th>
<th>TOPIC</th>
<th>CHAPTER(S)</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction / Vector Analysis Review</td>
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<tr>
<td>1</td>
<td>Coulomb’s Law and Electric Field Intensity</td>
<td>2</td>
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<td>2</td>
<td>Electric Flux Density, Gauss’ Law, and Divergence</td>
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<td>3</td>
<td>Energy and Potential</td>
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<td>4</td>
<td>Conductors and Dielectrics</td>
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<td>5</td>
<td><strong>Midterm Exam 1</strong></td>
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<td>5</td>
<td>Capacitance</td>
<td>6</td>
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<td>6</td>
<td>Steady Magnetic Field</td>
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<tr>
<td>6</td>
<td>Magnetic Forces, Materials, and Inductance</td>
<td>8</td>
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<td>7</td>
<td>Time-Varying Fields and Maxwell’s Equations</td>
<td>9</td>
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<tr>
<td>8</td>
<td><strong>Midterm Exam 2</strong></td>
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<td>8</td>
<td>Transmission Lines</td>
<td>10</td>
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<td>10</td>
<td>Uniform Plane Wave</td>
<td>11</td>
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<td>11</td>
<td>Plane Wave Reflection and Dispersion</td>
<td>12</td>
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<td>12</td>
<td>Guided Waves</td>
<td>13</td>
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<td>13</td>
<td>Electromagnetic Radiation and Antennas</td>
<td>14</td>
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<tr>
<td>14</td>
<td>Reading day</td>
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<tr>
<td>15</td>
<td><strong>Final Exam</strong></td>
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Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.

J. **COURSE POLICIES**

**Attendance/Tardiness**

Attendance will be taken on a daily basis. Students are expected to arrive on time for the beginning of the class. **Each student is responsible for what takes place in class each day, whether or not the student is present.**
Late Work and Make-up Exams

Assignments unless otherwise directed, should be solved by hand and show all work. Assignment must be completed with a high level of professionalism and be formatted properly. Points will be deducted for sloppy work, incorrect formatting, or if not all of the work is shown. Your assignment must be your own work. Students suspected of cheating or copying assignments from other students will be submitted to the corresponding office. Late assignments will not be accepted and will be given a grade of zero.

Test missed as a result of unexcused absences will result in a score of zero. Under most circumstances, the final exam grade will be substituted for tests missed due to excused absences. The absence must be excused in advance except in case of extreme emergency.

No makeup exams will be given, except under unusual circumstances and entirely at the discretion of the instructor.

Cell Phone Use

Cell phones should not be used unless allowed by the instructor during class.

Laptop Use

Laptops should be turned off during class, unless a student is using the electronic form of the textbook or complementary material.

Missed Exam

See “Late Work and Make-up Exams,” above.

Communications

All outside-of-class communications will be conducted through the message and e-mail functions of the Blackboard site for the class. Each student should make sure his or her preferred e-mail address is the one in the Blackboard system, and each student should check e-mail and the Blackboard message site regularly.

K. COLLEGE AND UNIVERSITY POLICIES

- Academic Integrity (University)
  It is expected that university students will demonstrate a high level of maturity, self-direction, and ability to manage their own affairs. Students are viewed as individuals who possess the qualities of worth, dignity, and the capacity for self-direction in personal behavior.
  See Full University Policy at http://catalog.tamucc.edu/content.php?catoid=10&navoid=313#Academic_Integrity

- Deadline for Dropping a Course with a Grade of W (University)
  I hope that you never find it necessary to drop this or any other class. However, events can
sometimes occur that make dropping a course necessary or wise. Please consult with your academic advisor, the Financial Aid Office, and me, before you decide to drop this course. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Please consult the Academic Calendar (http://www.tamucc.edu/academics/calendar/) for the last day to drop a course.

- **Grade Appeals (College of Science and Engineering)**
  As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at http://www.tamucc.edu/provost/university_rules/index.html, and the College of Science and Engineering Grade Appeals webpage at http://sci.tamucc.edu/students/GradeAppeal.html. For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

- **Disability Services**
  The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

  If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

  http://disabilityservices.tamucc.edu/

**GENERAL DISCLAIMER**

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.