

# ECE 3800-400 Electromagnetics – Distance Syllabus Summer 2024

Revision 0 (4/1/24)

<b>Instructor:</b>	Anthony Q. Martin	<b>Course Info:</b>	ECE 3800-400 Electromagnetics
<b>Class Time:</b>	Anytime	<b>Location:</b>	Canvas @ Clemson.edu
<b>Office/Phone:</b>	333 Fluor Daniel EIB	<b>Office Hours:</b>	Zoom, set by email
<b>email:</b>	<a href="mailto:martina@g.clemson.edu">martina@g.clemson.edu</a>	<b>Zoom ID:</b>	806 372 6363 (for office hrs)
<b>Mode:</b>	Asynchronous except during tests/exams		
<b>Weekly Meetings:</b>	Zoom ID: 950 2955 5619, PC: 3800S24 (Tues 3:30p, see below for exact dates)		
<b>Text:</b>	<i>Elements of Electromagnetics</i>	<b>Seventh Edition,</b>	by M. N. O. Sadiku
<b>GA:</b>	TBD		
<b>Objectives:</b>	To assist students in obtaining a solid understanding of the time invariant electromagnetic phenomena that provides the basis for application in engineering.		

		PDF Lectures Files
<b>Topics:</b>	1. Vector Math	3
	2. Vector Calculus	3
	3. Electric Charge & Electrostatic Fields	6
	5. Capacitance	1
	5. Static Currents & Magnetostatic Fields	3
	6. Inductance	1
	Total	17

## Course & Grading Policy:

- This is the version of the syllabus that will be used in summer 2024 (after the onset of the pandemic due to the spread of Covid-19 throughout the USA).
- **It is required, to be enrolled in this course during summer 2024 that you have a laptop/computer with a working webcam, and a reliable internet connection, at the time of enrollment and throughout the course. You will be required to use the Respondus Lockdown Browser for all tests and exams. No allowances will be made for equipment failure or lack of this equipment. Do not take this course if you do not have the proper functioning equipment (or can get access to such equipment). This is the only warning. No exceptions whatsoever will be made for you if you ignore this rule.**
- **In addition to the above, due to the method used in this course for testing (which is required), you must have a reliable internet connection. The exams and tests are given in synchronized mode, and if you are not available at the exact time of a testing period, then you will get a failing grade on the test, quiz, or final. No attempt at accommodation will be made. This course is asynchronous except during tests/ exams.**
- **Send your formula sheet(s) to me at [martina@g.clemson.edu](mailto:martina@g.clemson.edu), between 11am and 2pm the day of the exam. Failure to do so will result in a failing grade on the exam in question. All students **must** use a formula sheet on **\*all\*** exams. Your name must be on each page of your formula sheet.**
- Lectures are available in both PDF and as video files. Both will be available in your **Clemson Canvas** account.
- You need a “PDF” reader and a “wmv” or an “mp4” player.
- There will be 1 quiz, 2 tests and a final exam. These will be online (Canvas and Respondus Lockdown Browser).
- There will be a quiz specifically for testing the Respondus Lockdown browser in this course. This quiz will be worth 5% of your grade. This quiz will also give you a chance to see what the other tests will be like, but it will only contain two or three questions and will be brief. You will get a 100% score if you take the quiz.

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- Tests/quizzes/exams will mainly be in the multiple-choice format. Some combination of questions may be in a different answer format as Canvas allows for different types of questions beyond multiple-choice.
- Students **MUST** work **alone** on all exams, quizzes, and tests.
- Electronic communication devices are not allowed during tests or exams. Any non-approved device used on a test/exam will be immediate grounds for a grade of F in this course. Note that your computer webcam is approved and required during all quizzes, tests, and exams. If you fail to have your webcam on, and in view of you and your surroundings during the event, then your grade is automatically a zero. Notes and textbooks are not allowed and there will be monitoring using the Respondus video capture feature. Non-working or poorly placed webcams will be considered cheating and grounds for a failing grade in this course. Please note that this means you and your environment **will be recorded and stored in the cloud**. As far as I know, only myself and the TA/grader can view these recordings. I do not know what happens to them, however, or when they are deleted.
- A calculator is allowed during the tests/exams but it cannot be any kind of electronic communication device. Your calculator must be a single-function scientific/engineering calculation device (i.e., it cannot be a netbook, computer, smartphone, iPad, Chromebook, etc.). Your calculator must not be used as an information storage device from which you can retrieve additional information. **Calculators are to be used strictly for calculations of the equations needed in the material covered in this course**. Any other use is considered cheating and will result in a grade of F in the course. You will need to hold your ID, calculator, formula sheets, and pencil, in front of your webcam at the start of an exam, test, or quiz. Failure to comply will be considered cheating.
- Practice problems will be assigned from the textbook and solutions given on Canvas. These will **not** be graded. Other problems are listed in the lecture notes, and they should be worked by all students.
- Test results **may** be curved based on overall class performance, but this is **unlikely**. At minimum, a 10-point scale will be used.  $A > 90$ ,  $80 \leq B \leq 89$ ,  $70 \leq C \leq 79$ ,  $60 \leq D \leq 69$ ,  $F \leq 59$ .
- Students may bring one 8.5 x 11-inch sheet of paper with equations on **one side** to the first test, 1 sheet with equations on **two sides** to the second test, and 2 sheets of paper with equations on **3 sides** for the final exam. You will need to hold your formula sheets in front of your webcam at the start of an exam, test, or quiz. Failure to comply will be considered cheating. **Send your formula sheet(s) to [martina@g.clemson.edu](mailto:martina@g.clemson.edu), between 11am and 2pm the day of the exam. Failure to do so will result in a failing grade on the exam in question. Your name must be on each page of your formula sheet(s), and you **MUST** submit one for each test/final.**
- Due to the Canvas testing, students are allowed to bring loose sheets of paper (notebooks not allowed) for the only purpose of writing out their solutions to the problems seen on their laptop/computer screen. Notes and textbooks are not allowed and there will be monitoring via the Respondus video capture. Non-working or poorly placed webcams will be considered cheating and grounds for a failing grade in this course.
- The **formula** sheet(s) may contain **only formulas** — no **definitions, derivations, images, solutions, worked examples, homework problems, or more than three-word phrases may be included**. Formulas may be **labeled** but labels **cannot contain more than three words** (i.e., “**three-word phrase**”). **A formula may contain no more than three (3) equal signs**. Be aware that strings of formulas (multiple formulas grouped together or listed one after another on a similar topic) may form a derivation or a solution. You are not to duplicate entire sections of my notes or a textbook on your formula sheet.
- Students found in violation of formula sheet rules are subject to a deduction of one-question worth of credit from the exam for a violation found of the formula-sheet rule. Each violation can result in a reduction of one-question worth of credit and multiple violations can result in a reduction of multiple questions worth of credit.

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- Your overall grade will be based on the following weighting:

2 Tests	60 %
Respondus Quiz	5 %
Final	35 %

If you fail to take one of the two tests, then your final exam will be used in lieu of the missed exam (if you are excused by the instructor). You must take at least one test and the final exam to receive a passing grade in this course. Note that the final exam **will** replace the lower test grade, if higher, assuming you take both tests. If you don't take both tests, then your final exam score cannot replace the lower of the two test scores. No make-up exams will be given over the short (5-week) summer term.

- Students are allowed to bring a writing tool (pencil or pen) to all tests and the final exam.
- Typically, a test will have 15 to 35 questions with at least five possible answers, including “*none of the others*” or “*none of these*”.
- Course Start Date: Tuesday, May 14, 2024.**
- Memorial Day Holiday (no office hours): Monday, May 27, 2024.**
- Last day of classes: Tuesday, June 18, 2024.**
- Final Exam: Friday, June 21, 2024.**

**Office Hours:** All office hours will be conducted using Zoom (Zoom ID: 806 372 6363). Make an appointment with me via email first.

Cellphones have very good cameras. Send me a pic of your math/work on a problem to look at as we talk on Zoom (this is very helpful).

**Weekly Zoom Meetings:** Held on Tuesdays, 3:30pm at Zoom ID: 950 2955 5619, passcode: 3800S24. Attendance is optional. Dates are 5/21/24, 5/28/24, 6/4/24, 6/11/24, 6/18/24.

**Exam Administration:** All testing will be done over the Clemson website using Canvas and the Respondus Lockdown browser and monitor. The testing will be “synchronized,” meaning that all students in this course will take the tests/exams at the exact same time, regardless of physical location. Any student that is not within a three-hour time zone of Clemson, SC is NOT to enroll in this course and zero accommodation will be made to allow you to take the exams. You must have a fully functioning laptop/computer with a working webcam. If it should stop working during this course, you are totally on your own and no accommodation will be made on your behalf. Please take this warning seriously. If you cannot abide by these rules & conditions, then it is best that you do not take this course. I will strictly follow them.

**\*\*\* If you cannot meet all these requirements, you should drop this course immediately as it is not compatible with you. Clemson University has a very short period in which you can drop a course and receive a 100% refund of your tuition. DO NOT DELAY. No exceptions will be made for any reason. \*\*\***

**Clemson Canvas and Email Rule:** As this is a **distance** course with no class attendance, it is vitally important that students receive and respond to notifications in a timely fashion (the course is only five weeks in duration, so things happen very quickly). Two forms of notification are used in this course: (1) Canvas, and (2) email (via Canvas). Clemson provides each student access to the Canvas course management system and an email

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account. Many course notifications are sent through Canvas and these go through the provided email account for each student. Thus, students taking this course are required to check this email account regularly and routinely for timely information. I suggest checking your Clemson/Canvas email at least twice a day including weekends. If you miss information due to not checking your email, then you must endure the consequences of that. Deadlines will not be extended because you failed to check your email account. Other information will be provided in the Modules section of your Canvas and this is where PDF and video files covering the course material can be found. These areas should be checked frequently while enrolled in ECE 3800. Note: I am not technical support personnel, and I am not here to help you with the Clemson website, Canvas, Respondus, or registration. Also, I cannot help you figure out Clemson's email system or anything else of that nature. Please check the Clemson website as there are numerous methods for getting technical assistance.

This course starts on a specific day, and you are expected to login, download, take quizzes, and read the syllabus and be aware of the rules and policies of this course by that date. Note: I do try to make the Canvas page for this course available at least one (1) week before the official start of this course.

**Attendance:** As the course is a distance course (students are required to be within 3 time-zones of Clemson, SC, USA), there are no attendance requirements except during tests, quizzes, and the final exam. It is strongly suggested that students pay strict attention to the suggested study pace given in the **supplemental information file** found on your Canvas. See below.

**Academic Integrity:** Anyone caught in an act of academic dishonesty (cheating) will be penalized to the maximum extent allowed by Clemson University Academic Regulations. The full academic integrity statement is included as a PDF file on your Canvas. **As this is a distance course, special consideration is given to electronic communication devices (ECDs). Students taking exams on the website are NOT allowed to have ECDs on their persons during the tests or final exam. Failure to conform will result in a failing grade in this course. Failure to certify compliance will result in a grade of zero assigned.**

**Disability Access:** It is University policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have disabilities. Students are encouraged to contact Student Disability Services to discuss their individual needs for accommodation, obtain a letter if appropriate, and then to discuss those needs with the instructor. To be granted stated accommodation, the student must notify the instructor no later than three business days after the official start of the summer session in which this course is offered.

**Missed Tests:** Due to the short duration of the summer session, no student may miss a test or a quiz, if given. No changes in test/quiz dates or times are allowed. Also, all students must take and pass the final exam to pass this course. If you miss one test for any reason deemed suitable by the instructor, your final exam grade will be used in lieu of your missed test, but it will NOT be used again to replace your lower test score.

**Supplemental Information File:** A PDF file is on your Canvas that contains certain supplemental technical information that you may find handy during this course. There is also a file containing important formulas used throughout this course. This information may also be found at the end of this syllabus.

**Syllabus updates:** This syllabus may be updated at any time during the term. After the summer session starts, any updates will be minor and will likely be simple corrections.

**Test Dates:** 2024 Test dates, times are subject to change, but this is unlikely.

Respondus Quiz: **Fri, May 17**, Loc. & Time: Canvas & Respondus Lockdown, 2:30 pm to 2:45 pm (EDT)

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Test 1: Wed., May 29. Location & Time: Canvas & Respondus Lockdown, 2:30 pm to 4:00 pm (EDT).

Test 2: Wed., June 12. Location & Time: Canvas & Respondus Lockdown, 2:30 pm to 4:00 pm (EDT).

Final Exam: Friday, June 21. Location & Time: Canvas & Respondus Lockdown, **2:00p to 4:30p** (EDT).

All students should take note of these dates & times and arrange your schedule to be available to take the tests/final. Again, a laptop/webcam in good working order is required before taking this course. Should you develop any issues while taking this course, no efforts will be made to accommodate you.

## **Title IX Statement**

Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, veteran's status, genetic information or protected activity (e.g., opposition to prohibited discrimination or participation in any complaint process, etc.) in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sexual harassment and sexual violence as mandated by Title IX of the Education Amendments of 1972. This policy is located at <http://www.clemson.edu/campus-life/campus-services/access/title-ix/>. Mr. Jerry Knighton is the Clemson University Title IX Coordinator. He also is the Director of Access and Equity. His office is located at 111 Holtendorff Hall, 864.656.3181 (voice) or 864.565.0899 (TDD).

# ECE 3800 (Distance) – Electromagnetics

## Reading, Homework, Lecture PDF, and Study Pace

The following is a list of chapters from Sadiku that will be touched upon during this course. You are expected to read all these sections. The homework problems from Sadiku are listed too and their solution will be provided. Note that in the later chapters some material is skipped. Your guide here is the lectures. The material covered in the lectures is the key to what you will be tested on. Also, note that there are several additional problems in the notes that you will be asked to work on. However, you will **NOT** be given the solution to these problems.

ECE3800 is now using the 7<sup>th</sup> edition of Sadiku. All problems are from the 7<sup>th</sup> edition and the solutions provided on Canvas are for the 7<sup>th</sup> edition. These solutions are provided by the textbook writer, not your instructor. If you find errors (and this is not uncommon for textbooks), please send details (problem # and what you think is incorrect) to your instructor ([martina@g.clemson.edu](mailto:martina@g.clemson.edu)).

### Chapter 1: All sections

Homework: 1.1, 1.2, 1.4, 1.5, 1.8, 1.9, 1.10, 1.11, 1.16, 1.17, 1.19, 1.24, 1.29, 1.31, 1.32

Number of lecture PDF files: 2

Lecture file 1: 1\_ECE3800VectorMath\_1.pdf

Lecture file 2: 2\_ECE3800VectorMath\_2.pdf

### Chapter 2: All sections

Homework: 2.1, 2.2, 2.3, 2.4, 2.17, 2.18, 2.24, 2.25, 2.31

Number of lecture PDF files: 2

Lecture file 0: 0\_ECE3800CoordinateSystems\_1.pdf

Lecture file 3: 3\_ECE3800Transformations\_1.pdf

### Chapter 3: All sections

Homework: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.10, 3.13, 3.14, 3.15, 3.16, 3.17, 3.18, 3.25, 3.27, 3.28, 3.35, 3.38, 3.40, 3.41, 3.45, 3.46.

Number of lecture PDF files: 3

Lecture file 4: 4\_ECE3800VectorCalculus\_1.pdf

Lecture file 5: 5\_ECE3800VectorCalculus\_2.pdf

Lecture file 6: 6\_ECE3800VectorCalculus\_3.pdf

### Chapter 4: All sections

Homework: 4.1, 4.2, 4.5, 4.6, 4.7, 4.10, 4.13, 4.14, 4.15, 4.22, 4.23, 4.25, 4.29, 4.35, 4.36, 4.38, 4.39, 4.42, 4.49, 4.52, 4.65, 4.66, 4.68

Number of lecture PDF files: 5

Lecture file 7: 7\_ECE3800Electrostatics\_1.pdf

Lecture file 8: 8\_ECE3800Electrostatics\_2.pdf

Lecture file 9: 9\_ECE3800Electrostatics\_3.pdf  
Lecture file 10: 10\_ECE3800Electrostatics\_4.pdf  
Lecture file 11: 11\_ECE3800Electrostatics\_5.pdf

**Chapter 5:** Sections 5.1, 5.2, 5.3, 5.4, 5.6, 5.9 (read the other sections for your own benefit)

Homework: 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9, 5.10, 5.40, 5.41, 5.43 (a & c, not b), 5.45  
Number of lecture PDF files: 1 (electrostatic boundary conditions)  
Lecture file 12: 12\_ECE3800Electrostatics\_6.pdf

**Chapter 6:** Section 6.5 (pp 249-266, not solution of Laplace's or Poisson's equations)

Homework: 6.33, 6.40, 6.43, 6.47  
Number of lecture PDF files: 1 (capacitance)  
Lecture file 13: 13\_ECE3800Electrostatics\_7.pdf

**Chapter 7:** Sections 7.1, 7.2, 7.3, 7.4, 7.5, 7.6

Homework: 7.1, 7.2, 7.3, 7.4, 7.15, 7.16, 7.21, 7.22, 7.23, 7.26, 7.29, 7.31, 7.34, 7.37, 7.38  
Number of lecture PDF files: 2  
Lecture file 14: 14\_ECE3800Magnetostatics\_1.pdf  
Lecture file 15: 15\_ECE3800Magnetostatics\_2.pdf

**Chapter 8:** Sections 8.1, 8.2 (up to equation 8.7), 8.7, 8.8, 8.9

Homework: 8.31, 8.36, 8.38, 8.40, 8.44, 8.46, 8.48  
Number of lecture PDF files: 2  
Lecture file 16: 16\_ECE3800Magnetostatics\_3.pdf  
Lecture file 17: 17\_ECE3800Magnetostatics\_4.pdf

Please note that each lecture PDF file will correspond to one or more video files. The video files are in Windows Media Audio/Video (\*.wmv) format and you will need to be able to play, watch, and hear these files on your PC. Windows Media Player works well for me. I do not provide technical support. Video files have a naming scheme of "Lecture\_1.wmv", or "Lecture\_8\_Part\_3.wmv". They will be in a folder on your Blackboard. It is your responsibility to be able to view these media files.

It is strongly suggested that students download and store all PDF and wmv files at the beginning of the semester. It is important that the files always be available to you on your laptop/computer when your Internet connection is down or unavailable. The video & lecture files are meant to be listened to repeatedly for maximum benefit. This is an advantage over the traditional method of instruction. Be sure to make the best of it.

I sometimes develop more supplemental material as the course is occurring. You will need to recheck your Canvas periodically for updates.

## Suggested Study Pace (Summer 2024)

Book Chapter	Item	Cover-By Date
Charter 1	Lecture file 1	May 14
Charter 1	Lecture file 2	-
Chapter 2	Lecture file 0	-
	Respondus Lockdown Browser Quiz	May 17 – (this is a play quiz designed to: (1) make sure your computer/webcam works on Clemson’s site, and (2) let me know you are active in this course)
Charter 2	Lecture file 3	-
Charter 3	Lecture file 4	-
Charter 3	Lecture file 5	-
Charter 3	Lecture file 6	May 27
	Your test 1 review (this may be a good time to study lecture file 7 too)	May 28
	<b>Test 1</b>	Wednesday, May 29– over Lecture Files 0 through 6
Charter 4	Lecture file 7	May 30
Charter 4	Lecture file 8	-
Charter 4	Lecture file 9	-
Charter 4	Lecture file 10	-
Charter 4	Lecture file 11	-
Charter 5	Lecture file 12	June 10
	Your test 2 review	June 11
	<b>Test 2</b>	Wednesday, June 12 – over Lecture Files 7 through 12
Charter 6	Lecture file 13	June 14
Charter 7	Lecture file 14	-
Charter 7	Lecture file 15	-
Charter 8	Lecture file 16	-
Charter 8	Lecture file 17	June 19
	Your final exam Review	June 20
	<b>Final Exam</b>	Friday, June 21 – Comprehensive