

Course #7356 (3 credits)

Instructor: Dr. Alan R. Denton alan.denton@ndsu.edu
 Professor, Dept. of Physics office: SE 214B, NDSU

Classes: TTh, 9:30-10:45 am, SE 208 **Office Hours:** MW, 4:45-5:30 pm (Zoom)

Bulletin Description:

Electrostatics, magnetostatics, dielectrics, electric circuits, time varying electric and magnetic fields, electromagnetic induction, and application of Maxwell's equations.

Prerequisite: PHYS 252, MATH 266

Objectives: Students will master the foundations of electrodynamics and learn to apply theoretical and computational methods to model a variety of physical systems, including ionic solutions, plasmas, metals, and dielectric and magnetic materials.

Format: Students are expected to review assigned resources in advance and attend class prepared to discuss and work through guided exercises. You are not expected to fully understand the material before class, but be familiar with terminology and definitions. In this way, class time can be used more effectively to deepen conceptual understanding, strengthen problem-solving skills, and discuss practical relevance and applications.

Preparation: Basic knowledge of mathematical methods and mechanics

Textbook: D. J. Griffiths, *An Introduction to Electrodynamics*, 4th ed. (Pearson, 2013)

Evaluation:	Homework	100 pts	
	Exams	150 pts	(3 midterms and a final exam)
	Quizzes	50 pts	
	<u>Total</u>	<u>300 pts</u>	

Attendance is expected (NDSU Policy 333, www.ndsu.edu/fileadmin/policy/333.pdf), but face masks and physical distancing (2 m separation) are required in the classroom. *Note: Requests for remote participation will be accommodated through video conferencing.* Active engagement in class discussions is strongly correlated with success in this course!

Homework: Assignments will be posted on Blackboard (<https://bb.ndsu.nodak.edu>). While discussion of homework with classmates is encouraged, submitted work must be your own. Similarity to work of other students or to internet solutions will yield no points.

Quizzes: Reading quizzes and check-up quizzes will be posted on Blackboard.

Grading: A: $\geq 90\%$, B: 80 to $< 90\%$, C: 70 to $< 80\%$, D: 60 to $< 70\%$, F: $< 60\%$
 Grades will not be curved and any shift in grade boundaries will be only in your favor.

Contingency Plan for Remote Instruction and Learning

Requests for remote participation due to concerns over COVID-19 will be accommodated. See attached COVID-19 Related Information.

Should any circumstances necessitate strictly online instruction, all course resources will remain accessible through Blackboard and communications and interactive discussions will continue via email and video conference (e.g., Zoom, Blackboard Collaborate Ultra).

Preliminary Schedule

Week	Topic	Chapter(s)
1	Vector Analysis	1
2	Vector Analysis, Electrostatics	1, 2
3	Electrostatics	2
4	Electrostatics, Potentials	2, 3
5	Potentials	3
February 11	Midterm Exam 1	1–3
6	Potentials	3
7	Electric Fields in Matter	4
8	Electric Fields in Matter	4
9	Magnetostatics	5
10	Magnetostatics	5
March 25	Midterm Exam 2	3–5
11	Magnetic Fields in Matter	6
12	Magnetic Fields in Matter	6
13	Electrodynamics	7
14	Electrodynamics	7
April 29	Midterm Exam 3	5–7
15	Conservation Laws	8
16	Electromagnetic Waves	9
May 11	Final Exam	1–7

Computational Examples and Exercises

To supplement “textbook-style” problems, deepen conceptual understanding, and build computational skills, we will use *PhET Interactive Simulations* from the University of Colorado Boulder, *Mathematica*, and *Simulations in Physics* in the Open Source Physics Library, free Java software that can be downloaded, compiled, and run on any computer.

The academic community is operated on the basis of honesty, integrity, and fair play. NDSU Policy 335: Code of Academic Responsibility and Conduct applies to cases in which cheating, plagiarism, or other academic misconduct have occurred in an instructional context. Students found guilty of academic misconduct are subject to penalties, up to and possibly including suspension and/or expulsion. Student academic misconduct records are maintained by the Office of Registration and Records. Informational resources about academic honesty for students and instructional staff members can be found at www.ndsu.edu/academichonesty.

All access to NDSU computers must respect NDSU Senate Policy, section 158: Acceptable use of Electronic Communication Devices
<https://www.ndsu.edu/fileadmin/policy/158.pdf>

Any students with disabilities or other special needs, who need special accommodations in this course are invited to share concerns or requests with the instructor and to contact the Disability Services Office (www.ndsu.edu/disabilityservices) as soon as possible.

COVID-19 Related Information

Communication

Course-related information will be communicated primarily during synchronous class meetings. Reminders and notifications of any schedule changes will be communicated through NDSU email and posted on the Blackboard announcements page.

Your NDSU email address is the official route for course-related information.

You may participate virtually and synchronously in this course via Zoom, requiring WiFi, video, and audio capabilities. Office hours will be conducted via Zoom. You may also meet with me in person during office hours (please remember to wear a face covering).

If you have any technology concerns, please contact the IT Help Desk:

ndsu.helpdesk@ndsu.edu 701-231-8685 (option 1)

Submission of Assignments and Posting of Grades

All students (both face-to-face and remote participants) will submit assignments through our Blackboard course homepage, where all grades will be posted.

Copyright of Course Materials

Recording any class meetings with your own personal devices is strictly prohibited. See NDSU [Policy 190](#) on Intellectual Property.

Health and Safety Expectations

Information on COVID-19 and NDSU's response:

https://www.ndsu.edu/admission/fall_2020_prelim_plan

Please follow NDSU guidance on face coverings, physical distancing, and sanitation:

NDSU requires students to wear face coverings in classrooms. Wearing a face covering helps reduce the risk to others in case you are infected but do not have symptoms, and also may protect you from infection.

If you attend class in person, you must properly wear a face covering (covering both the mouth and nose) for the entire class. If you fail to properly wear a face covering, you will not be admitted to the classroom. However, you may choose to participate remotely.

Failure to follow NDSU guidelines will result in referral to the Dean of Students Office or administrative removal from class. Students who cannot wear a face covering due to a medical condition or disability may seek accommodation through Disability Services:

701-231-8463 <https://www.ndsu.edu/disabilityservices/>

Disinfecting supplies are provided for you to disinfect your learning space. You may also use your own disinfecting supplies.

Whenever possible, observe physical distancing guidelines, maintaining 2 m separation from others. Avoid congregating around the classroom entrance before or after class.

In accordance with NDSU [Policy 601](#), failure to comply with instructions, including this syllabus, may be handled according to the Code of Student Conduct resolution process and may result in disciplinary sanctions.

Food and drink are not allowed in class except with a documented accommodation through Disability Services (since consumption obviously requires removing your mask).

Do not come to class if you are sick. Please protect your health and the health of others by staying home, where you may participate remotely. For information on COVID-19, symptoms, testing, and steps to stay healthy see

https://www.ndsu.edu/studenthealthservice/covid_19/

Do not come to class if you have been exposed to individuals who tested positive for COVID-19 and/or you have been notified to self-quarantine due to exposure.

If you are unable to attend class at the scheduled time due to illness or exposure, contact me for alternate arrangements, including accommodations and extensions.

If you are absent from class as a result of a COVID-19 diagnosis or quarantine, the decision for approval of all absences and missed work is determined by the course instructor. As instructor, I will do the following to help you make progress in the course:

You will be able to participate in class remotely.

You will be able to submit assignments and take exams remotely.

Other remote learning options will be determined on a case-by-case basis.

HyFlex Options

Resource for students on HyFlex instruction, compiled by IT: <https://kb.ndsu.edu/learn>

If you are at high risk of contracting COVID-19 (or of infecting someone at high risk), you have the option of attending classes remotely via Zoom. You may opt to do so at the beginning of the semester or as the need arises during the semester.

To participate in HyFlex instruction remotely, you must have access to the requisite technology, including a laptop or computer with a functioning microphone, speakers (or headphones) and webcam, as well as reliable internet access.

To opt for the remote learning experience in this course, inform the instructor via email as soon as possible.

Additional Resources for Students

As a valued member of the NDSU community, resources are available for you should you need help in dealing with adverse reactions to things happening in the world today:

Counseling Services: 701-231-7671; <https://www.ndsu.edu/counseling/>

Disability Services: 701-231-8463; <https://www.ndsu.edu/disabilityservices/>

Student Health Service: 701-231-7331; <https://www.ndsu.edu/studenthealthservice/>

Dean of Students Office: 701-231-7701; <https://www.ndsu.edu/deanofstudents/>

In a crisis or emergency situation:

Call University Police: 701-231-8998

Call 9-1-1

Go to a Hospital Emergency Room

Go to Prairie St. John's for a Needs Assessment: 701-476-7216 (510 4th St. S, Fargo)

Call the FirstLink Help Line: 1-800-273-TALK (8255) or 2-1-1

Call the Rape and Abuse Crisis Center: 701-293-7273