Course Title	**:**	**Calculus Based Physics II with LAB**
Course Code	**:**	**PHYS 1320**
Credit Hours	**:**	**4**
Semester	**:**	**SPRING 2022**
Cap	**:**	**20**

Instructor   : Dr. Abraham Meles   Office# TECH 305   Email: ameles@navajotech.edu

Lab Assistant : Melvin Foster   Office# TECH 325   Email: mfoster@navajotech.edu

Office Hours **:** TR 2:00 PM – 3:20 PM Instructors will be available for LIVE online email questions or zoom and/or google meet.

Class Location: Hybrid (TECH Rm 305 and Online)

Meeting Times (HYBRID)   **: M 9:30AM-10:50 AM (face-to-face at TECH Rm 305)**

W 9:30AM-10:50 AM (online using Zoom)

W 2:00 PM – 4:50 PM (face-to-face Lab at TECH Rm 305)

Online activities include zoom meeting, videos, online homeworks will be uploaded on the homework webpage, lecture notes will be uploaded on Moodle, online virtual lab links and weekly tasks will be released by email.

Face-to-face activities are mainly reserved for labs, quizzes and lectures. Weekly emails will list detailed tasks of the week every Monday morning.

Final Exam: May 12, 2021. 8:00 AM – 9:50 AM

Required Materials:

Texts: *Physics for Scientists and Engineers***,** Nineth Edition**,** Serway, Raymond A. & Jewett, John W. Belmont, CA; Brooks/Cole; Cengage Learning, 2010 ISBN-13: 987-1-4390-4845-0

Homework Websites: webassign.net/login.html (1) Use Class Key: ntc XXXXXXX and your NTU email to register.(2) Buy WebAssign Access code from book store or online)

Tools:

For the online classes to be successful, **every student is required to have a laptop**. Students who don't have laptops, the cost of the laptops will be deducted from their Pell grant and then NTU will purchase laptops for them.

Need Scientific Calculator (NOT PHONE CALCULATOR). Flash Drive is recommended.

Lab Fee: $ 125

Mission Statement

Navajo Technical University's mission is to provide University readiness programs, certificates, associate, baccalaureate, and graduate degrees. Students, faculty, and staff will provide value to the Diné community through research, community engagement, service learning, and activities designed to foster cultural and environmental preservation and sustainable economic development.

The University is committed to a high quality, student-oriented, hands-on-learning environment based on the Diné cultural principles: *Nitsáhákees, Nahátá, Íína, Siihasin.*

Course Description

A calculus level treatment of classical electricity and magnetism. This course continues the study of physics begun in Calculus Based Physics I. A series of Laboratory experiments associated with the material presented. Students will apply the principles and concepts highlighting the main objectives covered in in the coursework

Lab included.

Prerequisite: PHY-1310C (Calculus-Based Physics I) and MTH-162 (Calculus I).

Communication

PLEASE OBTAIN YOUR NAVAJO TECHNICAL UNIVERSITY EMAIL AT THE BEGINNING OF THIS COURSE. E-mails sent to the instructor must have the subject line of the email to read:
SPRING2022-PHYS1320C–YourLastName_FirstName
Assignments are already uploaded on the course webpage and will be opened based on the following schedule.

Week	Chapters	Assignments Due date	Quizzes (Friday of that weak)
1	Electric fields	At the end of the week (Sunday 11:59pm)	
2	Electric fields	At the end of the week (Sunday 11:59pm)	
3	Gauss's Law	At the end of the week (Sunday 11:59pm)	
4	Gauss's Law	At the end of the week (Sunday 11:59pm)	**Quiz 1**
5	Electric Potential	At the end of the week (Sunday 11:59pm)	
6	Capacitance and Dielectrics	At the end of the week (Sunday 11:59pm)	
7	Current and Resistance	At the end of the week (Sunday 11:59pm)	**Quiz 2**
8	Direct Current Circuits	At the end of the week (Sunday 11:59pm)	
9	Review Session	At the end of the week (Sunday 11:59pm)	**Midterm**
10	Magnetic Fields	At the end of the week (Sunday 11:59pm)	
11	Sources of Magnetic Field	At the end of the week (Sunday 11:59pm)	
12	Faraday's Law	At the end of the week (Sunday 11:59pm)	
13	Inductance	At the end of the week (Sunday 11:59pm)	
14	Alternating Current Circuits	At the end of the week (Sunday 11:59pm)	**Quiz 3**
15	Electromagnetic Waves and Maxwell's Equations	At the end of the week (Sunday 11:59pm)	
16	Review Session	At the end of the week (Sunday 11:59pm)	
17	**Finals**		**Finals**

Important Dates
Jan 19   Instruction Begins
Jan 22   Last day to add/drop without "W"
Feb 26   Graduation Petition is due
Mar 8-12   Midterm Exams
Mar 15-19   Spring Break
Apr 1   Last day to withdraw with a "W"
May 10-13   Final Exams
May 13   Grades are due to the Registrar
May 14   Graduation

Course Goals

> At the end of the semester students will be able to

- Analyze scientific data and graphs.
- Apply physical laws and theorems to hypothetical situations involving Electricity, Electric circuit, Magnetism and EM waves.
- solve a hypothetical problem using an organized scientific method.
- Collaborate to complete group lab activities and assignments and presentations.

COURSE OUTCOMES	COURSE MEASUREMENTS
Upon completion of this course, the student will be able to: 1. Apply the concepts of electric charge, electric field and electric potential to solve problems. 2. Sketch the electric field in the vicinity of point, line, sheet, and spherical distributions of static electric charge. 3. Sketch the magnetic field in the vicinity of line, ring, sheet, and solenoid distributions of steady current. 4. Describe the relationship between electric field and electric potential. 5. Calculate the Lorentz force on a moving charge for simple geometries of the fields and use it to analyze the motion of charged particles**.** 6. Apply the integral forms of Maxwell's equations. 7. Calculate the energy of electromagnetic fields**.** 8. Analyze DC circuits. Lab Activities Outcomes 1. Develop a reasonable hypothesis. 2. Work effectively as part of a team. 3. Take measurements and record measured quantities to the appropriate precision. 4. Estimate error sources in experimental techniques.	Complete reading assignments, homework assignments, exams, projects, and quizzes.

5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools. 6. Determine whether results and conclusions are reasonable. 7. Present experimental results in written form in appropriate style and depth. 8. Experience the relationship between theory and experiment	

Grading Plan:

Tests	35%	A= 100 – 90%
Quizzes	20%	B > 90 – 80%
Homework	40%	C > 80 – 70%
Participation	5%	D > 70 – 60%
		F > 60%

Grading Policy

Each student must do his or her own homework and case studies. Discussion among students on homework and cases is encouraged for clarification of assignments, technical details of using software, and structuring major steps of solutions - especially on the course's Web site. Students must do their own work on the homework and exam. Cheating and Plagiarism are strictly forbidden. Cheating includes but is not limited to: plagiarism, submission of work that is not the student's own, submission or use of falsified data, unauthorized access to exam or assignment, use of unauthorized material during an exam, supplying or communicating unauthorized information for an assignment or exam.

Participation

Students are expected to attend and participate in all class activities- as listed above, as it is 5% of the grade. Points will be given to students who actively participate in class activities including field trips, laboratories, and ask questions of guest speakers and other presenters.

Cell phone and head phone use

Please turn cell phones off or place them on silence or vibrate mode **BEFORE** coming to class. Also, answer cell phones **OUTSIDE OF CLASS** (not in the classroom). Exercising cell phone use courtesy is appreciated by both the instructor and classmates. Headphones are to be removed before coming to class.

Attendance Policy

Students are expected to regularly attend all classes for which they are registered. A

percentage of the student's grade will be based on class attendance and participation. Absence from class, regardless of the reason, does not relieve the student of his/her responsibility to complete all course work by the required deadlines. Furthermore, it is the student's responsibility to obtain notes, handouts, and any other information covered when absent from class and to arrange to make up any in-class assignments or tests if permitted by the instructor. Incomplete or missing assignments will necessarily affect the student's grades. Instructors will report excessive and/or unexplained absences to the Counseling Department for investigation and potential intervention. **Instructors may drop students from the class after three (3) absences unless prior arrangements are made with the instructor to make up work and the instructor deems any excuse acceptable.**

Study Time Outside of Class for Face-to-Face Courses
For every credit hour spent in a class, a student is expected to spend two hours (2) outside of class studying the course materials.

Academic Integrity
Integrity (honesty) is expected of every student in all academic work. The guiding principle of academic integrity is that a student's submitted work must be the student's own. Students who engage in academic dishonesty diminish their education and bring discredit to the University community. Avoid situations likely to compromise academic integrity such as: cheating, facilitating academic dishonesty, and plagiarism; modifying academic work to obtain additional credit in the same class unless approved in advance by the instructor, failure to observe rules of academic integrity established by the instructor.

Diné Philosophy of Education
The Diné Philosophy of Education (DPE) is incorporated into every class for students to become aware of and to understand the significance of the four Diné philosophical elements, including its affiliation with the four directions, four sacred mountains, the four set of thought processes and so forth: Nitsáhákees, Nahát'á, Íína and Siih Hasin which are essential and relevant to self-identity, respect and wisdom to achieve career goals successfully.

Students with Disabilities
The Navajo Technical University and the Science department are committed to serving all enrolled students in a non-discriminatory and accommodating manner. Any student who feels he/she may need an accommodation based on the impact of disability, or needs special accommodations should inform NTU in accordance with the procedures of the subsection entitled "Students with Disabilities" under Section 7: Student Support Programs, NTU Student Handbook.

Notes:
I reserve the right to amend this syllabus. Any such amendments will be clearly communicated.