Doane University

Syllabus

Course Information

Physics 108
Introductory Physics II
4 Credit Hours

Communicating With the Instructor

This course uses a “three before me” policy for student to faculty communications. When questions arise during the course of this class, please remember to check these three sources for an answer before asking me to reply to your individual questions:

1. Course syllabus
2. Announcements in Blackboard
3. The Q & A discussion board

This policy will help you in potentially identifying answers before I can get back to you and it also helps your instructor avoid answering similar questions or concerns multiple times.

If you cannot find an answer to your question, please first post your question to the Q & A questions discussion board. Here your question can be answered for the benefit of all students by either your fellow students who know the answer to your question or the instructor. You are encouraged to answer questions from other students in the discussion forum when you know the answer to a question in order to help provide timely assistance.

If you have questions of a personal nature such as relating a personal emergency, questioning a grade on an assignment, or something else that needs to be communicated privately, you are welcome to contact me via email or through Zoom. My preference is that you will try to email me first. I will usually respond to email from 8am to 5pm on weekdays, please allow 24 hours for me to respond.

If you have a question about the technology being used in the course, please contact the Doane University Help Desk for assistance (contact information is listed below).

Course Catalog Description

A course designed to meet the needs of the pre-professional student and the science major as well as providing a second semester of physics for all students. Topics covered include electricity and magnetism, electronics, optics, and selected areas of modern physics. Students will gain conceptual understanding of the topics covered and ability to use quantitative methods to model physical phenomena. This course includes laboratory work.

Course Big Ideas

- Physical systems and their behavior can be modeled with graphical, mathematical, and schematic representations.
- Fundamental physics principles enable modeling and prediction of periodic and wave motion
- All atoms are made up of fundamental charges. Laws of physics apply to these charges and can be used to model their individual behavior and the behavior of net charge at a macroscopic level
- Magnetic materials have fundamental properties and can be used to induce electrical properties in conductors
- Light is an electromagnetic wave and has physical characteristics which change when passing through various mediums

Recommended Prerequisites

Doane Core Math Skills: Algebra, Trigonometry and Geometry

Course Textbook and Materials

Required

Modified MasteringPhysics with **eText** – Instant Access – for College Physics: A Strategic Approach, 3rd Edition

Knight, Jones & Field

©2015 | Electronic Package | ISBN-13: 9780321943781

Online purchase price: $115.95

Alternative

You must purchase access to mastering physics through Blackboard, but you are welcome to purchase the hard copy textbook:

College Physics: A Strategic Approach, 3rd Edition Knight, Jones & Field

ISBN-10: 1292057157

ISBN-13: 978-1292057156

Learning Objectives

Course Objectives

At the completion of this course students will be able to:

1. Define periodic motion and wave equations and use them to predict how a wave travels over time

2. Apply the fundamental equations of waves to sound and use them to predict the behavior of sound waves in various scenarios

3. Define electric charges, their physical characteristics, electrostatics, and use these principles to predict behavior of electric charges in various electric fields

4. Define charges in motion, their physical characteristics, and apply these principles to electric circuits

5. Define magnetic materials, their physical characteristics, and apply these to the manipulation of point charges

6. Define the effect that magnetic materials have on currents and use these effects to predict the behavior of electric and magnetic fields in various configurations

7. Define an electromagnetic wave, utilize the properties of waves to predict the behavior of light waves, and define how light waves change when entering a different medium

8. Define and utilize the lens equations, diffraction equations, and wave-matter interaction principles

Module Objectives

Module I:

a. Define periodic motion of a point mass including amplitude, restoring force, and frequency.
b. Create a graphical model of the periodic motion of a point mass and relate it to the mathematical expression.
c. Expand on examples of periodic motion to include circular motion and springs
d. Relate spring motion to biological springs; muscles, tendons, and dna
e. Use the equations of harmonic motion to predict the behavior of biological springs

Module II:

a. Define the wave equation in terms of a sound wave
b. Use the wave equation to define a wave on a string and define wave speed
c. Use the definition of a sound wave to predict a sound wave's behavior over time
d. Define and use decibel levels for describing the intensity of sound a function of distance
e. Define and use the Doppler effect to determine the changing of sound waves a function of source speed

Module III:

a. Define electrical charge, fundamental charge, and electrostatic force
b. Define electric fields and electric potential
c. Review vector and scalar behavior and relate it to electric field and electric potential
d. Use the definitions and vector mathematics to find the electric field and potentials of various configurations of point charges
e. Gauss's Law and electric fields

Module IV:

a. Define the physical properties of charges in motion, i.e. current, resistance, voltage,

and conductors
b. Relate these physical properties to one another by fundamental physics equations
c. Define Ohm's Law and use the properties of moving charges to derive the physical state of moving charges in a simple circuit
d. Define Kirchhoff's Laws and use them in a simple circuit to derive the behavior of moving charges
e. Simplify a complex circuit into a simple circuit and use the physical laws to derive the charge flow through the simple circuit

Module V:

a. Define a magnetic material, magnetic polarity, and magnetic field lines
b. Use the definitions of vectors to characterize a net magnetic field from several sources of magnetic fields
c. Depict magnetic fields from many sources and relate electrical current to producing a magnetic field and derive expressions for this relationship
d. Define and use the Lorentz force in examples of point charges and a current carrying wire
e. Define and give examples of dipoles in the human body

Module VI:

a. Define electromagnetic induction and explain the source of induction
b. Use the principle of electromagnetic induction to define magnetic field sources
c. Predict the behavior of conductors experiencing electromagnetic induction
d. Explain the use of electromagnetic induction in modern day technology
e. Define the uses of magnets in everyday life and research

Module VII:

a. Define an electromagnetic wave and relate its characteristics to colloquial terms
b. Define Huygens' principle and use it to explain refraction of light
c. Define and use the refraction and reflection equations when light is incident upon various mediums
d. Define geometrical optics and thin lenses
e. Use the principles of geometrical optics to diagnose eye defects

Module VIII:

a. Relate EM waves to the wave equation and manipulate the equation to define a resultant EM wave
b. Produce examples of EM waves that are not in the visible range of the EM spectrum and give examples of EM waves in radiation therapy
c. Define diffraction of light and use diffraction theory to predict a diffraction pattern
d. Define basic atomic structure and depict atoms from the Bohr Model
e. Define electron excitation and use diffraction theory to explain mass spectrometry

Course Requirements

Online Course

This is an online course and therefore there will not be any face-to-face class sessions. All assignments and course interactions will utilize internet-based technologies.

Attendance Policy

You should plan to work on this course everyday. This means that you must have a reliable and consistent internet connection throughout the duration of the course. It is strongly recommended that you not take any vacations during this course. This is a condensed, fast- paced course and it would be extremely difficult to catch up after a prolonged absence.

Course Preparation and Participation

Preparation for class means reading the assigned readings & reviewing all information required for that week. *Attendance* in an online course means logging into the Blackboard and on a regular basis and *participating* in the all of activities that are posted in the course.

Studying and Preparation Time

The course requires you to spend time preparing and completing assignments. A three-credit course requires 144 hours of student work. Therefore expect to spend approximately 18 hours a week preparing for and actively participating in this 8-week course.

Computer Requirements

This course requires that you have access to a computer that can access the internet. You will need to have access to, and be able to use, the following software packages:

- A web browser (Chrome or Mozilla Firefox)
- Adobe Acrobat Reader
- Adobe Flash Player
- Google Docs or other word-processing software
- Java

These programs are free and fairly easy to install. Your instructor can help you with basic questions regarding these items. You are responsible for having a reliable computer and internet connection throughout the course.

Email and Internet

You must have an active Doane University e-mail account and access to the Internet. *All instructor correspondence will be sent to your Doane* University *e-mail account.* Please plan on checking your Doane Gmail account regularly for course related messages.

This course uses Blackboard for the facilitation of communications between faculty and students, submission of assignments, and posting of grades. The Blackboard Course Site

can be accessed at http://bb2.doane.edu

Campus Network or Blackboard Outage

When access to Blackboard is not available for an extended period of time (greater than one entire evening - 6pm till 11pm) you can reasonably expect that the due date for assignments will be changed to the next day (assignment still due by midnight).

Late or Missed Assignments
ALL assignments must be finished and turned in to complete the course. Unless the instructor is notified BEFORE the assignment is due and he or she provides an opportunity for the student to submit a assignment late, points may be taken off for a late assignment.

Late Policy:
Q & A – You will be required to post one answer or question to the Q & A discussion board each Wednesday, before 11:59p.m. Each Q & A question is worth 1% of your final grade. If you are late with this portion of your assignment, then you will forfeit that 1%.
Homework – Homework assignments will be due Sunday by 11:59p.m. If you are late with a homework assignment, you will receive a 10% deduction on the late assignment, for each day that it is past the deadline. **It is strongly encouraged that you work on these assignments each day.** Any homework assignment of 50% or higher will receive full credit. Any homework assignment of less than 50% will receive zero credit.
Labs – Lab reports are due by 11:59p.m. each Sunday. If you are late turning in a lab report or completing the Late Nite Lab activities, then you will receive a 10% reduction in the grade for that lab, for each day past the deadline, until it is completed.
Weekly Quiz – You will have a quiz over every weekend, due before 11:59p.m. each Sunday. If you are late on the quiz, you will receive a 10% reduction in the grade for that quiz for each day past the deadline.

Additional Requirements
Students are required to complete 75% of the course material in order to receive credit for the course. If students who fall more than two weeks behind, they cannot meet this requirement and will receive a withdrawal (W) for the course if this occurs within the first three weeks of the course. If this happens after the third week students will receive an F for the course.

Submitting Assignments
All assignments, unless otherwise announced by the instructor, must be submitted via Blackboard. Each assignment will have a designated place for submission.

Drop and Add dates
If you feel it is necessary to withdraw from the course, please contact your advisor for full details on the types of withdrawals that are available and their procedures.

Subject to change notice
All material, assignments, and deadlines are subject to change with prior notice. It is your responsibility to stay in touch with your instructor, review the course site regularly, or communicate with other students, to adjust as needed if assignments or due dates change.

Academic Integrity
Doane University expects and requires all its students to act with honesty and integrity, and respect the rights of others in carrying out all academic assignments. Academic dishonesty, the act of knowingly and willingly attempting or assisting others to gain academic success by dishonest means, is manifested in various measures. Gehring, et al, (1986) suggests that four categories of academic dishonesty exist[1]:

a. Cheating
b. Fabrication
c. Facilitating academic dishonesty
d. Plagiarism

For more information on academic integrity, please visit the website:
http://catalog.doane.edu/content.php?catoid=4&navoid=191

Course Grading

Grades and Grading Scale
Assignment of letter grades is based on a percentage of points earned. The letter grade will correspond with the following percentages achieved. All course requirements must be completed before a grade is assigned.

A	100 – 90
B	89 – 80
C	79 – 70
D	69 – 60
E	59 and below

Your final percentage will be assessed with the following criteria.

Discussion Board Participation -	10%
Labs -	25%
Homework -	25%
Quizzes -	40%
TOTAL	**100%**

See the requirements for the specific Assignments on Blackboard.

How to Succeed in this Course

- Check your Doane email regularly

- Log in to the course web site daily
- Communicate with your instructor
- Create a study schedule so that you don't fall behind on assignments

Accessibility Statement

In compliance with the Rehabilitation Act of 1973, Section 504, and the Americans with Disabilities Act of 1990, professional disability specialists and support staff at Doane University facilitate a comprehensive range of academic support services and accommodations for qualified students with disabilities. Doane University staff coordinate transition from high schools and community colleges, in-service training for faculty and staff, resolution of accessibility issues, community outreach, and collaboration between all Doane University regarding disability policies, procedures, and accommodations.

Student Conduct Statement

Students are required to adhere to the behavior standards listed in **Doane University Policy Manual**

Appropriate classroom behavior is defined by the instructor. This includes the number and length of individual messages online. Course discussion messages should remain focused on the assigned discussion topics. Students must maintain a cordial atmosphere and use tact in expressing differences of opinion. Inappropriate discussion board messages may be deleted if an instructor feels it is necessary. Students will be notified privately that their posting was inappropriate.

Student access to the course Send Email feature may be limited or removed if an instructor feels that students are sending inappropriate electronic messages to other students in the course.

Technical Support Contact Information

For technical assistance 24 hours a day, 7 days a week, please contact the Doane University Technology Office Help Desk:

Phone: 402-826-8411
Email: helpdesk@doane.edu
Web: http://www.doane.edu

Syllabus Disclaimer

The instructor views the course syllabus as an educational contract between the instructor and students. Every effort will be made to avoid changing the course schedule but the possibility exists that unforeseen events will make syllabus changes necessary. The instructor reserves the right to make changes to the syllabus as deemed necessary. Students will be notified in a timely manner of any syllabus changes face-to-face, via email or in the course site Announcements. Please remember to check your Doane University email and the course site Announcements often.