UC 123160 135

CBM003 ADD/CHANGE FORM

☒ Undergraduate Council ☐ New Course ☒ Course Change Core Category: Life/Phys Sci Effective Fall ~~2013~~ 2014	or	Graduate/Professional Studies Council ☐ New Course ☐ Course Change Effective Fall 2013

APPROVED SEP - 4 2013

RECEIVED APR - 4 2013

1. Department: Physics College: NSM
2. Faculty Contact Person: Donna Stokes Telephone: 3-3588 Email: dstokes@uh.edu
3. Course Information on New/Revised course:
   - Instructional Area / Course Number / Long Course Title: PHYS / 1322 / University Physics II
   - Instructional Area / Course Number / Short Course Title (30 characters max.) PHYS / 1322 / UNIVERSITY PHYSICS II
   - SCH: 3.00 Level: FR CIP Code: 40.0801.00 Lect Hrs: 3 Lab Hrs: 0
4. Justification for adding/changing course: **To meet core curriculum requirements**
5. Was the proposed/revised course previously offered as a special topics course? ☐ Yes ☒ No
   If Yes, please complete:
   - Instructional Area / Course Number / Long Course Title: ____ / ____ / _____
   - Course ID: _____ Effective Date (currently active row): _____
6. Authorized Degree Program(s): BA/BS
   - Does this course affect major/minor requirements in the College/Department? ☐ Yes ☒ No
   - Does this course affect major/minor requirements in other Colleges/Departments? ☐ Yes ☒ No
   - Can the course be repeated for credit? ☐ Yes ☒ No (if yes, include in course description)
7. Grade Option: Letter (A, B, C ...) Instruction Type: lecture ONLY (Note: Lect/Lab info. must match item 3, above.)
8. If this form involves a change to an existing course, please obtain the following information from the course inventory: Instructional Area / Course Number / Long Course Title
   PHYS / 1322 / University Physics II
   - Course ID: _____ Effective Date (currently active row): _____
9. Proposed Catalog Description: (If there are no prerequisites, type in "none".)
   Cr: 3. (3-0). Prerequisites: PPHYS 1321 and credit for or concurrent enrollment in MATH 2433. Description (30 words max.): Primarily for science and engineering majors. Credit may not be applied toward a degree for PHYS 1322 and PHYS 1302. Thermodynamics, electricity, magnetism, electromagnetic waves, optics, and modern physics.
10. Dean's Signature: _____ Date:_____

    Print/Type Name: _____

REQUEST FOR COURSES IN THE CORE CURRICULUM

Originating Department or College: Physics/NSM

Person Making Request: Donna Stokes Telephone: 713-743-3588

Email: dstokes@uh.edu

Dean's Signature: _____ Date: Click here to enter text.

Course Number and Title: Phys 1322 University Physics II

Please attach in separate documents:

X Completed CBM003 Add/Change Form with Catalog Description

X Syllabus

List the student learning outcomes for the course (Statements of what students will know and be able to do as a result of taking this course. See appended hints for constructing these statements):

Upon completion of this course, students will be able to (1) master the physical concepts of electricity and magnetism; (2) apply these to obtain solutions to technical problems; (3) use this scientific foundation to continue studies in more advanced courses in science and engineering. (4) convey knowledge of the principles of physics and be able to use these principles to solve problems; (5) take a real life problem and use physical principles and mathematical tools to describe the problem.

Component Area for which the course is being proposed (check one):

***Note:** If you check the Component Area Option, you would need to also check a Foundational Component Area.

☐ Communication ☐ American History

☐ Mathematics ☐ Government/Political Science

☐ Language, Philosophy, & Culture ☐ Social & Behavioral Science

☐ Creative Arts ☐ Component Area Option

X Life & Physical Sciences

Competency areas addressed by the course (refer to appended chart for competencies that are required and optional in each component area):

X Critical Thinking
X Communication Skills
X Empirical & Quantitative Skills
X Teamwork
☐ Social Responsibility
☐ Personal Responsibility

Because we will be assessing student learning outcomes across multiple core courses, assessments assigned in your course must include assessments of the core competencies. For each competency checked above, indicated the specific course assignment(s) which, when completed by students, will provide evidence of the competency. Provide detailed information, such as copies of the paper or project assignment, copies of individual test items, etc. A single assignment may be used to provide data for multiple competencies.

Critical Thinking:
Problems/questions which require critical thinking skills will be included in homework assignments. Homework assignments are assigned through Wiley Plus, the online homework system associated with the textbook used for the course. Sample homework problems/questions are included.

Problems and questions which require critical thinking will also be included on examinations for the course.

Communication Skills:
Communication skills will be assessed through essay/short answer questions and/or problems assigned through the Wiley Plus online homework system.

Empirical & Quantitative Skills:
Empirical and quantitative skills will be assessed through essay/ short answer questions and/or problems assigned through the Wiley Plus online homework system and/or exams for the course.

Teamwork:
Peer instruction using personal response devices (clickers) will be used to administer concept tests consisting of 2-3 short multiple-choice conceptual questions will be used to assess teamwork. Concept questions are asked to the class as a whole and each student choses an answer. The students are encouraged to share their opinions on the problem with their peers in small groups of 2-3 people. Each student is allowed the opportunity to explain their answer and engage in discussion if their answers are different. The question is asked a second time and students select their answer. The correct answer is revealed and a distribution of the solutions chosen is shown. This allows the instructor as well as the student the opportunity to see where misconceptions may be occurring, how the student grasp the concepts and how well the student work together. A sample concept test is included.

Teams consisting of 5-8 people will be assigned to create a study guide for each of the 4 exams for the course. The study guides will be posted in Blackboard and students will be able to choose the study which is best for use to prepare for the exam. Each group will have to work together to determine what will be included on the study guide and the best format for presenting it to the students.

Social Responsibility:
Click here to enter text.

Personal Responsibility:
Click here to enter text.

Will the syllabus vary across multiple section of the course? ☐ Yes X No
If yes, list the assignments that will be constant across sections:
Click here to enter text.

Inclusion in the core is contingent upon the course being offered and taught at least once every other academic year. Courses will be reviewed for renewal every 5 years.

The department understands that instructors will be expected to provide student work and to participate in university-wide assessments of student work. This could include, but may not be limited to, designing instruments such as rubrics, and scoring work by students in this or other courses. In addition, instructors of core courses may be asked to include brief assessment activities in their course.

Dept. Signature: _____

The following courses have been reviewed and approved by the NSM Curriculum Committee to meet the new core requirements. Given the length of the individual submissions I have elected to submit these requests by electronic means only.

Natural Sciences: Core Courses

BIOL 1309 – Human Genetics and Society

BIOL 1310 – General Biology

BIOL 1320 – General Biology

BIOL 1361 - Introduction to Biological Science I

BIOL 1362 - Introduction to Biological Science II

CHEM 1301 – Foundations of Chemistry

CHEM 1331 – Fundamentals of Chemistry I

CHEM 1332 – Fundamentals of Chemistry II

GEOL 1302 - Introduction to Global Climate Change

GEOL 1330 - Physical Geology

GEOL 1340 - Introduction to Earth Systems

GEOL 1350 - Introduction to Meteorology

GEOL 1360 - Introduction to Oceanography

GEOL 1376 - Historical Geology

PHYS 1301 - Introductory General Physics I

PHYS 1302 - Introductory General Physics II

PHYS 1321 - University Physics I

PHYS 1322 - University Physics II

Mathematics: Core Courses

MATH 1310 – College Algebra

MATH 1311 – Elementary Mathematical Modeling

Math/Reasoning: Core Courses

COSC 1306 – Computer Science and Programming

MATH 1330 - Precalculus

MATH 1431 - Calculus I

MATH 1432 – Calculus II

MATH 2311 – Introduction to Probability and Statistics

Writing in the Disciplines: Core Courses

BCHS Biochemistry Lab II

BIOL 3311 – Genetics Lab

PHYS 3313 – Advanced Lab I

Ian Evans

Associate Dean

4/4/13

UNIVERSITY of HOUSTON

COLLEGE OF NATURAL SCIENCES & MATHEMATICS HTTP://NSM.UH.EDU

COURSE TITLE/SECTION: Physics 1322 University Physic II/Class Number #####

TIME: **Class time and days** **LOCATION:** Building and room #

FACULTY: **Instructor's name** **OFFICE HOURS:** time and days and by appointment
Building and room #

E-mail: e-mailaddress@uh.edu **Phone: (713) 743-3550** **FAX: (713) 743-3589**

I. Course: Physics 1322 - University Physics II

A. Catalog Description: Primarily for science and engineering majors. Prerequisite: Thermodynamics, electricity, magnetism, electromagnetic waves, optics, and modern physics.

B. Prerequisites: Credit for or concurrent enrollment in MATH 2433. Credit may not be applied toward a degree for PHYS 1322 and PHYS 1302.

II. Course Learning Objectives:

The objective of this course is to learn the principles of electricity and magnetism, understand the concept of thermodynamics and be able to apply these concepts to solve problems.

Upon completion of this course, students will be able to:

1. master the physical concepts of electricity and magnetism;
2. be able to apply these to obtain solutions to technical problems;
3. use this scientific foundation to continue studies in more advanced courses in science and engineering.

Other learning outcomes include:

1. Students completing this course will be able to convey knowledge of the principles of physics and be able to use these principles to solve problems.
2. Students will be able to take a real life problem and use physical principles and mathematical tools to describe the problem.

III. Course Content:

This course will cover chapters 18 - 37 which include the following topical areas:

1. Thermodynamics
2. Theory of Gases
3. Electric Charge and Electric Fields
4. Gauss' Law

5. Electric Potential
6. Circuits
7. Magnetic Fields
8. Induction
9. Electromagnetic waves
10. Interference and Diffraction
11. Relativity

IV. Course Structure:

The web address for the class is www.phys.uh.edu.

V. Textbooks

Fundamentals of Physics, 9th edition, by Halliday, Resnick and Walker. **Binder version with access code to Wiley Plus is available at the UH bookstore.**

VI. Course Requirements

A. Written Assignments: 3-10 **homework** problems will be assigned at the beginning of each chapter and will be due approximately one week from that date. Three of the assigned problems will need to be turned in on paper to be graded and the remaining problems will be due on-line through Wiley Plus. They will be graded on a scale of 0 to 5, where 5 points are given for a completely correct solution and 0 points for a totally incorrect solution. Late homework is only accepted with a valid excuse. The URL for accessing this course at Wileyplus.com is listed below:

http://edugen.wiley.com/yourclaassurl/

B. Exams: There will be three **one hour exams** and a three hour **final exam** for a total of four exams for the class.

The **regular exams** are each worth 20% of your final grade for a total of 60% for the three exams. They will cover 2-4 chapters. Partial credit will be given.

The **final exam** will be comprehensive covering all chapters covered for the course. The format of the final exam will be similar to that of a regular exam. This exam will be given during the University scheduled time and will be worth 25% of your final grade.

There are no makeup exams for this course. The lowest exam score will be replaced by the final exam score if the final exam score is higher.

C. **Teamwork Component: (Extra Credit)** A team work component will be evaluated in this course by one of the two methods below.

Concept test will be administered during lecture for each chapter. Answers for the concept tests will be submitted using a personal remote system (clicker). Students will discuss these questions in teams of 2-3 students as a method of peer instruction. Each clicker costs $40 plus tax. For the detailed Clicker purchasing information, please contact

Barnes & Noble in the UC
4800 Calhoun Rd.
126 University Center
Houston, TX 77204
Phone: 713-748-0923

NOTE: You can use your book loan to buy a clicker through the bookstore. **See Blackboard for clicker registration instructions.**

Teams consisting of 5-8 people will be assigned to create a study guide for each of the 4 exams for the course. The study guides will be posted in Blackboard and students will be able to choose the study which is best for use to prepare for the exam. Each group will have to work together to determine what will be included on the study guide and the best format for presenting it to the students.

VII. Evaluation and Grading

15% Homework
20% Regular Exam I
20% Regular Exam II
20% Regular Exam III
25% Final Exam (Day, time and location)

Policy on grades of I (Incomplete): The grade of "I" (Incomplete) is a conditional and temporary grade given when a student, for reasons beyond his or her control, has not completed a relatively small portion of all requirements. Sufficiently serious, documented situations include illness, death in the family, etc.

VIII. Consultation

My office is located in room ## of Science and Research #1. My mailbox is located in the Physic office, room 617 in Science and Research # 1. My office hours will be from ?????-????? pm on Mondays and Wednesdays.

IX. Bibliography

References: The Feynman Lectures on Physics, R. Feynman, R.B. Leighton, and M. Sands

Addendum: Whenever possible, and in accordance with 504/ADA guidelines, the University of Houston will attempt to provide reasonable academic accommodations to students who request and require them. Please call 713-743-5400 for more assistance.

It is each student's responsibility to read and understand the Academic Honesty Policy found in the Student Handbook, which can be found at http://www.uh.edu/dos/hdbk/acad/achonpol.html.

Academic Dishonesty: Please see following website for information regarding academic dishonesty. www.uh.edu/honpol.

Standard Disclaimer: This syllabus is subject to change at the discretion of the instructor.

Spring 2013 Course Schedule TTh with a Friday Recitation

	Chapter	Notes
15-Jan-13	18	
17-Jan-13	18	
18-Jan-13	Recitation	Problems/Interactive Learning
22-Jan-13	19	
24-Jan-13	19	
25-Jan-13	Recitation	Problems/Interactive Learning
29-Jan-13	19&20	
31-Jan-13	20	***Jan 30 - Last Day to Drop Without a W***
1-Feb-13	Recitation	Problems/Interactive Learning
5-Feb-13	20	
7-Feb-13	21&22	
8-Feb-13	Recitation	Problems/Interactive Learning
12-Feb-13	22	
14-Feb-13	23	
15-Feb-13	Recitation	Problems/Interactive Learning
19-Feb-13	23	
21-Feb-13	24	
22-Feb-13	Recitation Exam	Review/ Problems/Interactive Learning **Exam 1, Ch. #, Friday 5:30 - 7pm**
26-Feb-13	24	
28-Feb-13	25	
1-Mar-13	Recitation	Problems/Interactive Learning
5-Mar-13	25	
7-Mar-13	26	
8-Mar-13	Recitation	Problems/Interactive Learning
11-15-Mar-13	Spring Break	
19-Mar-13	26	
21-Mar-13	27	
22-Mar-13	Recitation Exam	Review/ Problems/Interactive Learning **Exam 2, Ch. #, Friday 5:30 - 7pm**
26-Mar-13	28	
28-Mar-13	29	***Mar 27- Last Day to Drop with a W***
29-Mar-13	Recitation	Problems/Interactive Learning
2Apr-13	30	
4-Apr-13	31	
5-Apr-13	Recitation	Problems/Interactive Learning
9-Apr-13	32	
11-Apr-13	33	
12-Apr-13	Recitation	Problems/Interactive Learning
16-Apr-13	34&35	
18-Apr-13	36	
19-Apr-13	Recitation	Problems/Interactive Learning
23-Apr-13	37	

25-Apr-13	38	
26-Apr-13	Recitation	Review/ Problems/Interactive Learning
	Exam	**Exam 3, Ch. #, Friday 5:30 - 7pm**
7-May-13	Final Exam	**Final, Ch. #, time**

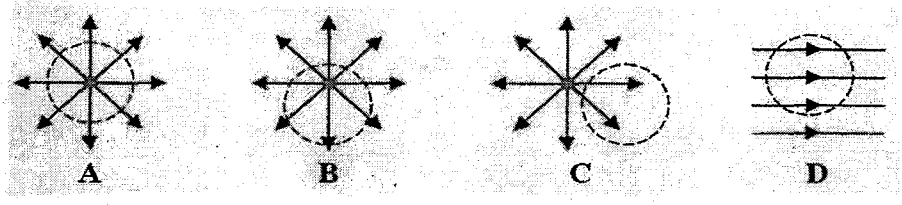
Physics 1322 – University Physics I!

Sample Concept test (clicker questions) for chapter covering Guass' Law

1. **IGauss' law can be used to prove that all excess charge in a conductor distributes itself on the surface of the conductor. Which one of the following choices is a consequence of this proof?**
   a) **There would be a non-zero electric field if any net charge was not on the surface.**
   b) **Charges can never be inside the conductor.**
   c) **A Gaussian surface around the whole conductor encloses all of the charge.**
   d) **The flux through a Gaussian surface inside the sphere is zero.**
   e) **The electric field inside a conductor is always equal to zero N/C.**

2. **A spherical conductor has a radius *R* and a tiny spherical cavity at its center that has a radius *R*/10. The conductor is otherwise solid. Inside the cavity is a positive charge *Q*. What is the electric field at a distance *R*/2 from the center?**
   a) **zero N/C**
   b) $E=\frac{1}{4\pi\varepsilon_0}\frac{Q}{R^2}$
   c) $E=\frac{1}{4\pi\varepsilon_0}\frac{Q}{\left(\frac{1}{2}R\right)^2}$
   d) $E=\frac{1}{4\pi\varepsilon_0}\frac{Q}{\left(\frac{1}{10}R\right)^2}$
   e) $E=\frac{1}{4\pi\varepsilon_0}\frac{Q}{\left(\frac{1}{2}R\right)}$

3. **In each of the four cases below a Gaussian circle is represented by the dashed line circle and the arrows represent electric field lines. In which of the four cases is the flux through the Gaussian circle not equal to zero?**



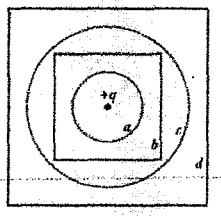
   a) **A and B only**
   b) **C and D only**
   c) **A only**
   d) **D only**
   e) **A, B, C, and D**

Physics 1322 – University Physics II
Sample Homework/Exam Problems

Short Answer/Essay

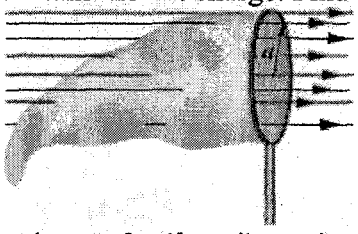
1. A small charged ball lies within the hollow of a metallic spherical shell of radius R. For three situations, the net charges on the ball and shell, respectively, are (1) + $4q$, 0; (2) -$6q$, +$10q$; (3) +$16q$, -$12q$. Rank the situations according to the charge on (a) the inner surface of the shell and (b) the outer surface, most positive first.

2. Figure 23-22 shows, in cross section, two Gaussian spheres and two Gaussian cubes that are centered on a positively charged particle. (a) Rank the net flux through the four Gaussian surfaces, greatest first. (b) Rank the magnitudes of the electric fields on the surfaces, greatest first, and indicate whether the magnitudes are uniform or variable along each surface.



Problems

1. In Fig. 23-28, a butterfly net is in a uniform electric field of magnitude E = 3.0 mN/C. The rim, a circle of radius a = 11 cm, is aligned perpendicular to the field. The net contains no net charge. Find the electric flux through the netting.



2. A charge of uniform linear density 2.0 nC/m is distributed along a long, thin, nonconducting rod. The rod is coaxial with a long conducting cylindrical shell (inner radius = 5.0 cm, outer radius = 10 cm). The net charge on the shell is zero. (a) What is the magnitude of the electric field 15 cm from the axis of the shell? What is the surface charge density on the (b) inner and (c) outer surface of the shell?

Multiple Choice

1. A point particle with charge q is placed inside a cube but not at its center. The electric flux through any one side of the cube:
   A) is zero
   B) is q/ε_0
   C) is $q/4\varepsilon_0$
   D) is $q/6\varepsilon_0$
   E) cannot be computed using Gauss' law

2. A round wastepaper basket with a 0.15-m radius opening is in a uniform electric field of 300 N/C, perpendicular to the opening. The total flux through the sides and bottom, in $N \cdot m^2/C$, is:
   A) 0
   B) 4.2
   C) 21
   D) 280
   E) can't tell without knowing the areas of the sides and bottom