Examination #1 is scheduled for Tuesday 19 September 2017 at 8:30 am in OCNPS142.

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INSTRUCTOR: Professor Desmond C. Cook

OFFICE: Room 235, OCNPS (Oceanography and Physics Building), Elkhorn Ave.

PHONE: 683-4695

E-MAIL: DesmondCook@odu.edu

PHY231 Home Page: http://www.odu.edu/~desmondcook/teach/phys231/

Course PRE-REQUISITE: Math 211 (Calculus I) is a pre-requisite for Physics 226N/231N/261N.

NOTE: Phys226/231/261 Grade of C is pre-requisite for Phys227/232/262.

LECTURES: OCNPS 142-4: Tuesday, Thursday 08:30 - 10:20 am

LABORATORY: Phys111/231/261 labs run at various times during the week. Choose any open section to register.

RECITATION: (PHYS 226 and 261 only) OCNPS 142-4: Friday 10:00 - 10:50 am. (Grady White).

ASSIGNMENTS: One each week using Mastering Physics (MP) Online Assignment System. Examination Review Questions will be part of assignments on MP prior to each examination.

Course TA’s

Raj Ghimire OCNPS Room 119 E-Mail: rghim002@odu.edu

COURSE FORMAT: (2 semester sequence)

Physics 226/231/261 and 227/232/262 course are not taught using the traditional lecture and laboratory format, but rather the interactive "Scale-Up" format. The class is maximized at 60 students sitting at 10 round tables. The course consists of short lectures intervened with student problem solving exercises and discussions. One primary instructor (Physics Professor) and one Teaching Assistant are assigned to the class to instruct and help students. Materials are presented on 4 projection screens in the class-room. The primary assessment consists of 4 written examinations (including Final), spaced regularly throughout the semester. Outside the classroom, students complete weekly assignments through an on-line, interactive program (Mastering Physics, MP). 10 laboratory experiments (Start week 3) will be completed during the semester.

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COURSE MATERIAL:

1. REQUIRED COURSE MATERIALS:

Please carefully read and understand the information below concerning Course Materials.

ALSO carefully read the section concerning registration for Mastering Physics as well as connecting to your assignments for this course.

1. TEXTBOOK: (REQUIRED): For PHYS226/227, PHYS231/232 and PHYS261/262 the required textbook is University Physics Edition 14 by Young and Freedman, (Pub. Pearson). If purchased NEW as a Package from the ODU Bookstore, it should include the MASTERING PHYSICS REGISTRATION CODE for Assignments (See below). There are several versions of this 14th edn text including with and without Modern Physics as well as one known as Technology Update. It does not matter which version you get, although the price may vary between them. We do not use the Modern Physics section in Phys226/231/261/227/232/262, but it is the most common version available.

Due to the high cost of textbooks, we will allow you to use University Physics Editions 12 and 13 by Young and Freedman which is much cheaper to buy used or to rent. See More Below

2. Mastering Physics (MP) Registration Code and Course Access Code:
For new students to Phys226/231/261 connecting with your assignments is a two-step process.
(a) Use your MP Registration code to set up an account (username and password) with MP. This code may come with the new textbook and can be purchased on the MP website when you register. It is also available in the ODU bookstore for a higher price.
(b) Once you have the MP account, use the Course Code MPCOOK11466 to link to assignments for our section. (same Course Code for PHYS226, 231 and 261 students). See the NOTE 4 below concerning text book selection in MP.

NOTE 1: Please e-mail me immediately if you already have an MP account and have used it previously for PHYS226/231 or equivalent at ODU or elsewhere. In this case you may be recorded as registered with a different textbook to the one we are using now. I will need your name, UIN and account login name.

NOTE 2: Obtaining the MP Registration Code. This code comes with new copies of the text (14th edition) from the Bookstore. It is a SEALED bundled package. It can also be purchased separately through MP website. The cost is $69 for up to 3 semesters of use (no e-text included). It is also available with e-text for $116. It is much cheaper to rent the 12th - 14th Editions of the text and buy the MP Registration Code separately on the MP Website.

NOTE 3: When you take PHYS227/232/262, your MP account will still be active and you will only have to submit a new MPCode provided by your professor to link to your class assignments. (No extra cost).

NOTE 4: Once you have a registered account you will be asked to select the course textbook. You must select University Physics with Modern Physics 14th edition (Young and Freedman), independent of which textbook you use.

NOTE 5: BEWARE of Used Textbook Vendors who advertise "Includes Mastering Physics". There is typically fine print somewhere not guaranteeing optional items such as MP, CD's etc with used books. Call the vendor to confirm if in doubt. You should look for sealed packages (text + MP + discs etc.) all wrapped as one package.

NOTE 6: If you rent a text online typically the listed cost is for only 1 semester and you will have to rent again for Phys227/232/262.

3: Renting or Buying used copies of University Physics Edition 12, 13 or 14

Buying or renting a used copy of University Physics Edition 12, 13 or 14, and also buying MP code separately for assignments is probably the overall cheapest method which is cost shared over two semesters for PHYS226/227/261 and Phys231/232/262. Assignment problems on MP are independent of whether you have edn 12, 13 or 14 although most problems are in both texts.

4. Laboratory Manual: Required:

Physics 111 & 231 Laboratory Manual 1st edition. It is only available at the University Village Bookstore and the non-ODU bookstore on 49th St.

5. Calculators: Each student must have and bring an appropriate scientific calculator to each class for problem solving. Calculators will not be provided. Mobile phones cannot be used as calculators during exams.

6. Clickers: Clickers will not be used in our section of this course.

OFFICE HOURS: Tuesday 10:30am - 11:30 am in OCNPS 235

COURSE Assessment: Exams (4) ..........................15+20+20+20 = 75%
Assignments...........................................................10%
Laboratory.............................................................. 15%

Mid-Semester Evaluation:
Old Dominion University requires faculty of 100 and 200 level courses to submit a Progress Report Grade via LEO to the Academic Enhancement Program by October 5, 2017. This grade will be compiled from work completed by October 4, 2017 and weighted according to the Course Grade schedule listed above.

EXAMINATION DATES: All examinations are in OCNPS 142-4.

Exam 1: Tuesday September 19, 2017, 8:30 - 10:20am
Exam 2: Tuesday October 17, 2017, 8:30 - 10:20am
Exam 3: Tuesday November 14, 2017, 8:30 - 10:20am
Exam 4: Tuesday December 12, 2017, 8:30 - 11:30am
Mobile phones cannot be used as calculators during exams and must remain on your table at all times during exams. Students are responsible for providing their own calculators for use during exams and in class.

There is no Laboratory Final Examination. Laboratory grades are allocated by the lab instructors based on Lab reports, attendance and participation.

ASSIGNMENTS: Once you have set up your MP account (account name and password), you can link to our specific course section assignments by typing in the specific Course Code, MPCOOK11466. You will be asked to select the textbook from which assignment problems are determined. It is University Physics with Modern Physics Edition 14 independent of which text you have purchased or rented.

ASSIGNMENTS: SEE Mastering Physics CODE MPCOOK11466
1. One assignment will be due at the end of each chapter (approximately each week), (Total 14), as posted on the MP Website
2. Assignments are due before 11:59 p.m. at the Mastering Physics Site on the indicated date.
3. Assignment solutions will be posted on this PHY226/231/261 Website.
4. Exam Review Problems will also be posted on MP prior to each of the 4 examinations.

Registering for MP and inputting the CourseCode MPCOOK11466 will add your name to the online Class List and allow you to do the required assignments and many optional tutorials. If you are new to Mastering Physics, then at some stage before your first assignment, you should complete the test assignment, (Assignment 00) to learn the Mastering Physics system, which is a very powerful learning system. Note that assignment problems used are commonly the same as in the chapters of Y&F BUT MP MAY ALTER the DATA (numbers) used to calculate the answer. Therefore each student will complete the same problem using different data. For any individual student, once you access your assignment, the numbers provided for any problem will remain the same each time you login.

No individual extensions of assignment submission dates will be given.

Assignment solutions will be posted on this course website soon after the submission due date.

READING ASSIGNMENTS:
You will be given a reading assignment to complete before each class. You should spend at least 1 hour each class day reading your text book.

LABORATORY:
Laboratory will run each week for 1:50 duration. Your Laboratory TA will provide details in the first session. Lab is NOT SCHEDULED for the first 2 weeks with the first lab scheduled in OCNPS 138 starting the week of 11 September 2017.

GROUP WORK:
You will often work in groups at your table to discuss and complete in-class problems

QUIZZES:
Short quizzes may be given during regular class time. They cover general knowledge items presented in lectures. A quiz consists of a few short problem-solving and descriptive questions designed to take you 20-30 minutes or less, if you are prepared. Generally, these will be taken with no books or notes. There are no make-ups for the quizzes.

PHYSICS LEARNING CENTER:
Help with any aspect of physics is available in the Physics Learning Center (PSB 2nd Floor Foyer), Monday-Friday 9am - 5pm.
The Physics Learning Center is a place where students can get together to work on their assignments and get assistance, if needed, from physics faculty and grad students. No appointment is necessary. Students in all introductory classes are encouraged to drop by the Learning Center for help on homework, lab, lecture, other course material, or just for a place to work while in the physics building. Note: staffing of the Physics Learning Center starts the second week of classes. More info, including a detailed staffing schedule, can be found at the following link: http://www.odu.edu/physics/resources/learning-center Some reference textbooks are available and must not be removed from the Center.

EXAMINATIONS:
This course has four examinations. The Examination Dates are listed above. If you must miss an exam, contact Dr. Cook as soon as possible.

Make-up exams may be given on a case-by-case basis, but you must have a legitimate and documented reason for missing an exam or you will receive a zero for the exam.

All examinations are closed book. You will be permitted to use a calculator. The formula sheet will be provided.

ATTENDANCE:
Attendance is mandatory. Class attendance will be recorded each day. If you have to legitimately miss a class, it is your responsibility to find out what you missed. Students who miss less than 5 lectures will be given 1-5% bonus on their final grade.

University Honor Code:
You are expected to conform to the University Honor Code in all aspects of your conduct in this course. You may work with others on the homework assignments, however, what you submit must represent your own understanding of the problem. Submitting answers...
online for problems that you have not worked out is cheating. Misconduct of any form will not be tolerated. If you are ever unsure of what is allowed, please consult with Dr. Cook for clarification.

POLICY ON ACADEMIC DISHONESTY:

Students may consult the "Student Disciplinary Policy and Procedures" Manual (located in the department secretarial office) for details. A significant item is the following:

"All official disciplinary sanctions, including grade sanctions, which are assigned to a student as a result of an act of academic dishonesty, will be recorded on the student's official University transcript."

Students are requested to report cases of Academic Dishonesty to the instructor. This particularly includes copying of assignment solutions or laboratory reports, and communication between students during examinations. All reported information will be treated as confidential.

POLICY ON CLASS DISRUPTION:

Class disruption will not be tolerated. Students attending class have the right to a professional, quiet and amiable learning environment free of disruptions from students within and outside the classroom. Cell phone and beepers must be silenced during class times and examination times. Students are requested to report disruption to the instructor. Use of cell phones (including texting), and other forms of inappropriate disruption during class will result in the student being dismissed from the class for the day.

COURSE OBJECTIVES: Physics 226/231N/261N-227/232N/262N is designed for students majoring in physics, engineering, mathematics, chemistry, and related disciplines for whom a thorough grounding in the principles of physics is essential. Accordingly, the students are expected to demonstrate a substantial understanding of those principles through problem solving and derivations. The Physics 226/231N/261N course is an introduction to mechanics, waves, fluids and thermal physics. Class work includes lectures and laboratories.

In this course, you will learn new concepts and how to think logically. You will use both inductive and deductive methods for analyzing a situation. In other words, we expect you to stretch the capabilities of your brain. This is not a descriptive course where memorization is all that is required. Physics is not a subject that you should expect to pass merely by reading the text the night before an exam. You must participate actively in the learning process by doing problems.

TOPICS COVERED: Refer to the University Catalog. University Physics is a two section course (PHYS226/231N/261N and PHYS227/232N/262N) which is recommended to be taken sequentially. The first course, Physics 226/231N/261N establishes the fundamentals in Mechanics, Waves and Thermodynamics. It is broken down into five unequal sections:

1. Mathematical Introduction
2. Mechanics I - mostly single particle translation
3. Mechanics II - rigid body dynamics & vibrations
4. Waves, gravity and fluids - Types and phenomena
5. Heat and Thermodynamics

PHYS 226/231N/261N, University Physics

SYLLABUS

Text: Chapter numbers as listed in University Physics, 14th Edition, by Young and Freedman.

Topics: (Fall 2017 Schedule for lectures at 1:50 duration Tuesday, Thursday.)

1. Mathematical Introduction Ch 1 2 lectures
2. Mechanics I Ch 2-8 14 lectures
3. Mechanics II Ch 9-11, 14 8 lectures
4. Waves Ch 15-16 3 lectures
5. Fluids and Gases
6. Heat and Thermodynamics Ch 17-18 2 lectures

Topic Details:

1. Mathematical Introduction
Unit and dimensions, standards of length, mass and time.
Scalars and vectors, vector algebra, resolution of vectors.
Unit vectors, dot product and cross product.

2. Mechanics I
Motion in a straight line; velocity and acceleration in general and uniformly accelerated motion. Free fall.
Motion in two and three dimensions. Projectile motion.
Uniform circular motion. Relative velocity.
Newton's laws and force. Friction.
Work and energy. Kinetic energy and Potential energy.
Conservation of energy and momentum.
Elastic and inelastic collisions.

3. Mechanics II
Rotational kinematics. Angular velocity and acceleration.
Equations of rotational kinematics. Rotational dynamics.
Torque, angular momentum and rotational inertia. Parallel axis theorem. Combined translational and rotational motion.
Equilibrium of a rigid body. Simple Harmonic Motion.
Gravitation, gravitational fields and potential energy.

4. Waves
Classification of waves; longitudinal and transverse.
Wave equations and superposition of waves.
Traveling and standing waves. Resonance and beats.
Doppler effect and shock waves.
Speed of light and Lorentz transformations.
Time dilation and length contraction.

5. Fluids and Gases
Fluid flow and pressure. Archimedes' principle.
Equation of continuity and Bernoulli's equation.
Gas laws, temperature.

6. Heat and Thermodynamics
Heat energy, thermal expansion and heat conduction.
Specific heat and latent heat.
Isobaric, isothermal, isovolumetric and adiabatic processes.
Enteropy and the laws of thermodynamics.

LECTURES:
Lectures will be held in the main lecture room, OCNPS Room 146, located in the Physics Building on Elkhorn Ave (opposite the baseball ground).
Lectures run Tuesday and Thursday from 8:30 a.m. - 10:20 a.m. with a 5 minute break at about 9:30 a.m.
Lecture material will be presented mainly by overhead projectors and PPT. Lecture notes are available for download on this course website.

LECTURE COURSE SEQUENCE

COURSE TIMETABLE
THIS TIMETABLE IS NOT OFFICIAL UNTIL THIS MESSAGE IS DELETED
<table>
<thead>
<tr>
<th>Date</th>
<th>Assignments</th>
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<tbody>
<tr>
<td>9/22/17</td>
<td>Newton's Laws: General Equilibrium</td>
</tr>
<tr>
<td>10/03/17</td>
<td>Friction, Centripetal Force</td>
</tr>
<tr>
<td>10/05/17</td>
<td>Work, Work and Kinetic Energy</td>
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<td>10/06/17</td>
<td>Mid-Semester Grades Due</td>
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<td>10/10/17</td>
<td>Fall Break</td>
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<tr>
<td>10/13/17</td>
<td>Potential Energy</td>
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<tr>
<td>10/14/17</td>
<td>Examination 2 Covers 2D motion and Newton's Laws, equilibrium, friction.</td>
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<tr>
<td>10/19/17</td>
<td>Conservation of Energy</td>
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<tr>
<td>10/24/17</td>
<td>Linear Momentum &amp; Collisions, Energy and Collisions: Applications</td>
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<tr>
<td>10/26/17</td>
<td>Energy and Collisions: Applications, Problems</td>
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<tr>
<td>10/27/17</td>
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<tr>
<td>10/31/17</td>
<td>MECHANICS II: Rotational Kinematics, Rotational Inertia</td>
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<tr>
<td>11/02/17</td>
<td>Angular Momentum Torque</td>
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<td>11/03/17</td>
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<tr>
<td>11/07/17</td>
<td>Rotational Equilibrium</td>
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<tr>
<td>11/09/17</td>
<td>Rotational Equilibrium: Applications</td>
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<td>11/10/17</td>
<td>Ex03Review (11/10/17) 4pm</td>
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<tr>
<td>11/14/17</td>
<td>Examination 3 Covers Chapters 6, 7, &amp; (LEC 12-17) Y&amp;F Edn 13 &amp; 14</td>
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<tr>
<td>11/16/17</td>
<td>Periodic Motion Harmonic and Simple Harmonic Motion (spring)</td>
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<td>11/17/17</td>
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<tr>
<td>11/21/17</td>
<td>Periodic Motion Harmonic and Simple Harmonic Motion (spring)</td>
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<tr>
<td>11/23/17</td>
<td>Thanksgiving</td>
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<tr>
<td>11/24/17</td>
<td>Thanksgiving</td>
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<tr>
<td>11/28/17</td>
<td>Covers Chapters 9-11 (LEC 19-24) (Mechanics II up to and inc Equilibrium)</td>
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<tr>
<td>12/01/17</td>
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<tr>
<td>12/05/17</td>
<td>HEAT: Temperature and Thermal Expansion Specific Heat Phase Changes, Heat Energy Calculations</td>
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<tr>
<td>12/07/17</td>
<td>HEAT: Temperature and Thermal Expansion Specific Heat Phase Changes, Heat Energy Calculations</td>
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<tr>
<td>12/08/17</td>
<td>Ex04Review (12/08/17) 4pm</td>
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<tr>
<td>12/12/17</td>
<td>Examination 4 Covers Chapters 9-11, 14, 17 (Rotation, SHM, Heat.)</td>
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9/6/2017

Physics 231 Home Page

<table>
<thead>
<tr>
<th>Time</th>
<th>Description</th>
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<tbody>
<tr>
<td>08:30 - 11:30 a.m.</td>
<td>(LEC 18-28)</td>
</tr>
<tr>
<td>15: 1 - 3</td>
<td>WAVES: Mechanical Waves. Wave Superposition</td>
</tr>
<tr>
<td>15: 4 - 8</td>
<td>WAVES: Resonance and Standing Waves, Sound Waves and Beats</td>
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LABORATORY SEQUENCE (OCNPS 138)


Available at the University Village Bookstore and the non-ODU bookstore on 49th St.
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>16-Oct-17</td>
<td>Newton's Laws</td>
</tr>
<tr>
<td>23-Oct-17</td>
<td>P06 Resolution of Forces</td>
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<tr>
<td>30-Oct-17</td>
<td>P07 Friction</td>
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<tr>
<td>6-Nov-17</td>
<td>P08 Conservation Laws</td>
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<tr>
<td>13-Nov-17</td>
<td>P09 Circular Motion</td>
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<tr>
<td>20-Nov-17</td>
<td>NO LAB Thanksgiving Holiday</td>
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<tr>
<td>27-Nov-17</td>
<td>P10 Waves</td>
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<tr>
<td>4-Dec-17</td>
<td>NO LAB Lab Make-Up</td>
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<tr>
<td>11-Dec-17</td>
<td>NO LAB Final Exams</td>
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