

**PHYSICS 232  
SPRING 2009**

**FUNDAMENTALS OF PHYSICS: WAVES, OPTICS AND MODERN  
PHYSICS**

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**General Information**

Lecture Hours – 11:15 – 12:05 Mon/Wed/Fri

Office Hours – 1:00 – 2:00 Mon/Wed/Fri (or by appointment)

Laboratory Hours – As scheduled for your section

Text - Young & Freedman, *University Physics*, 12th Edition with Modern Physics

**General Course Description**

Continuation of 231. This course covers material concerning waves, sound, light, optics, relativity, quantum mechanics and other aspects of modern physics.

**Prerequisites**

Physics 231 is a prerequisite for this course. The course and textbook presume a familiarity with calculus and calculus concepts. A background in mathematics up to the level of Math 141-142, or equivalent, is highly recommended and is probably necessary for success in the course.

**Communication via Blackboard (<http://online.utk.edu>)**

Aside from in-class discussion, the primary method of communication between you and me will be via Blackboard and/or email. This syllabus and other important information and announcements will be posted there, as well as copies of the slides used in lecture. Your grades on in-class exams will be posted in the Blackboard Grade-book, and your grades will be available for only you to see. The homework website, WebAssign, is entered from the tools menu on Blackboard and registration for class participation through clicker questions is accomplished from the tools menu on Blackboard. More on these things will appear below and on Blackboard. At the end of the semester, your homework and laboratory grades will also be posted on Blackboard, along with your final grade. To log into Blackboard (<http://online.utk.edu>), you use your university username and password. After logging in, you can select from My Courses the one titled Combin03830200922: Physics 232 Combined S2009.

## Grade Determination

Your final grade will be determined by your in-lecture participation via use of a clicker and your performance on the WebAssign homework assignments, the laboratory, three 1-hour tests, and the final examination weighted as follows:

In-Lecture Participation (Clickers)	5%
Homework Grade	20%
Laboratory Grade	25%
Lowest 1-Hour Test Grade	0
Other Two 1-Hour Test Grades	14% each
Final Examination (May 5, 8:00 am)	22%

Please note that your lowest 1-hour test score will not count toward your final grade. Hence, one test may be missed for any reason without penalty. In the event you miss a test, it will be considered the low score and will be dropped in the grade determination. Consequently, **NO MAKE-UP 1-HOUR TESTS WILL BE GIVEN**. The in-class tests will be closed book exams, but a list of useful equations and constants will be provided.

*While laboratory work will be graded by each Lab Instructor independently, an effort will be made to insure a uniform grading policy between different laboratory sections. **Laboratory make-ups are entirely at the lab instructor's discretion and arrangements for such must be made with the lab instructor.*** The schedule of labs is listed at <http://www.phys.utk.edu/labs/S09ph232syl.pdf>

Homework sets will be assigned On-Line using the **WebAssign** software system. You will need to purchase an access code for WebAssign. You should always enter the WebAssign site via the Tools menu on Blackboard. This is especially true when you sign up for the WebAssign class initially, as this will assure that you enter the WebAssign course correlated with our course. The homework assignments will be due at 11:00 am on the due dates listed below. The homework will be graded by the WebAssign software system and the sum of the grades for these sets will be used to determine your homework grade and eventually 20% of your total grade.

The use of clickers is primarily intended to stimulate discussion and to determine which concepts need further clarification in class. Your In-Lecture Participation grade will be based on your ability to answer conceptual questions during the lecture periods. The questions may be directed toward content from your reading assignments and also toward points made in lecture and may come at any time during any class period. Thus, you should bring your clicker to every lecture. As preparation you should do the reading assignments before each class. Before the second lecture, you should obtain your clicker (Either purchase one or get one from another student who is not using theirs.), and follow the instructions on Blackboard (under Course Information) to register your clicker for use in class. Points toward your final grade will be based on your answers as follows.

Percent of questions answered correctly	Points toward final grade
>70%	5
>50%	4
>40%	3
>30%	2
>20%	1
<20%	0

### Academic Honesty

*All work submitted by a student is expected to represent his/her own work. Students are expected to enter their own homework without assistance from others. Students are expected to perform all work in conformance with the University policies regarding Academic Honesty.*

### Conversion to Letter Grades

A	90 - 100
A-	88 - 90
B+	85 - 88
B	80 - 85
B-	78 - 80
C+	75 - 78
C	70 - 75
C-	67 - 70
D+	64 - 67
D	60 - 64
D-	55 - 60
F	0 - 55

### **Lecture Dates, Topics and Assignments for Physics 232, Spring, 2009 11:15 – 12:05 MW**

Day	Lecture Date	Lecture topic	Reading Assignments	HW Set Due (11:00 am)
1	Jan. 7	Periodic Motion, Simple Harmonic Motion	<b>13.1-3</b>	
2	Jan. 9	Applications of SHM	<b>13.1-6</b>	
3	Jan. 12	More Realistic Oscillatory Motion	<b>13.7-8</b>	
4	Jan. 14	Description of Mechanical Waves	<b>15.1-3</b>	<b>Set 1</b>
5	Jan. 16	Wave Speed and Energy & Standing Waves	<b>15.4-8</b>	
	Jan. 19	MLK Holiday		
6	Jan. 21	Description of Sound Waves	<b>16.1-3</b>	
7	Jan. 23	Sound Waves Interference, Doppler Eff.	<b>16.4-7</b>	<b>Set 2</b>
8	Jan. 26	Doppler Effect and Shock Waves	<b>16.8-9</b>	
9	Jan. 28	Description of Electromagnetic Waves	<b>32.1-3</b>	
10	Jan. 30	Energy and Momentum in EM Waves	<b>32.4-5</b>	<b>Set 3</b>
11	Feb. 2	Reflection and Refraction of Light	<b>33.1-3</b>	
12	Feb. 4	Catch-up and Review		

13	Feb. 6	Test 1		
14	Feb. 9	Polarization, Huygens's Principle	<b>33.4-7</b>	
15	Feb. 11	Image Formation by Reflection	<b>34.1-2</b>	<b>Set 4</b>
16	Feb. 13	Image Formation by Refraction	<b>34.3-4</b>	
17	Feb. 16	Optical Devices	<b>34.5-8</b>	
18	Feb. 18	Two Source Light Interference	<b>35.1-3</b>	<b>Set 5</b>
19	Feb. 20	Interference in Thin Films, Michelson Int.	<b>35.4-5</b>	
20	Feb. 23	Light Diffraction from Single Slit	<b>36.1-3</b>	
21	Feb. 25	Diffraction with Multiple Slits and Circular holes	<b>36.4-7</b>	<b>Set 6</b>
22	Feb. 27	The Need for and Hypotheses of Special Relativity	<b>37.1-2</b>	
23	Mar. 2	Review and Catch-up		
24	Mar. 4	Test 2		
25	Mar. 6	Relativity of Time and Space	<b>37.1-4</b>	
26	Mar. 9	Coordinate Transformation in Special Rel.	<b>37.5-8</b>	<b>Set 7</b>
27	Mar. 11	Dynamics in Special Relativity	<b>37.8-9</b>	
28	Mar. 13	The Need For and Properties of Photons	<b>38.1-3</b>	
	Mar. 16-20	Spring Break		
29	Mar. 23	Hydrogen Spectra, Nuclear Atom, and the Bohr Model	<b>38.3-5</b>	<b>Set 8</b>
30	Mar. 25	The Wave Nature of Particles	<b>39.1-3</b>	
31	Mar. 27	Foundations of Quantum Mechanics	<b>39.5,40.1-2</b>	
32	Mar. 30	Potential Barriers and Tunneling	<b>40.3-4</b>	<b>Set 9</b>
33	Apr. 1	QM Treatment of Hydrogen Atom	<b>41.1-2</b>	
34	Apr. 3	Electron Spin and Many-Electron Atoms	<b>41.3-4</b>	
35	Apr. 6	Catch-up and Review		<b>Set 10</b>
36	Apr. 8	Test 3		
	Apr. 10	Spring Recess		
37	Apr. 13	Molecular Bonding	<b>42.1-4</b>	
38	Apr. 15	Metals and Semiconductors	<b>42.5-7</b>	
39	Apr. 17	Basic Properties of Nuclei	<b>43.1-2</b>	<b>Set 11</b>
40	Apr. 20	Decay of Radioactive Nuclei	<b>43.3-4</b>	
41	Apr. 22	Nuclear Reactions and Energy	<b>43.6-8</b>	
42	Apr. 24	Catch-up and Review		<b>Set 12</b>
43	May 1, 10:15am	Final Exam		

For best use of lectures, you should study the sections for each lecture prior to class. If you have questions about the material assigned, you can then ask them during the class.

If you need course adaptations or accommodations because of a documented disability, please contact the Office of Disability Services at 2227 Dunford Hall (telephone/TTY 865-974-6087; e-mail [ods@utk.edu](mailto:ods@utk.edu)) by January 16. This will ensure that you are properly registered for services.