

# PHYS105 University Physics 1- Syllabus

Fall 2016

Instructor: Maia Magrakvelidze; JEPS 429

**Textbook:** "Fundamentals of Physics" (10<sup>th</sup> Edition) by Halliday, Resnick, and Walker

**ISBN10:** 1118230647

Section	Time	Room #
LECTURE (MWF)	10:00-10:50 a.m.	JEPS 219
LAB (T)	9:00 -10:50 a.m.	JEPS 217

**Course Description and Objectives:** This (one of the two semester course) is a calculus based course designed 1) to understand the foundations of calculus-based mechanics and thermodynamics; to develop: 2) a strong conceptual understanding of the physical concepts introduced in the course 3) critical thinking and mathematical skills and 4) the problem-solving techniques needed for scientist and engineers. **A good knowledge of calculus is needed (Math121).**

**Reading:** Please read the textbook before each lecture class and before doing homework. Reading from the textbook is assigned for each week. Completing the reading before class will greatly improve your learning experience (please see the tentative schedule for reference).

**Homework:** There will be one homework (on average) assigned each week. Doing homework problems is an important part of obtaining success in physics, helping you organize your thoughts, learn the concepts, and apply them. Try to do Homework as soon as possible after the lecture. So you don't get behind. Please see **the written homework procedure. NO LATE HOMEWORK IS ACCEPTED.**

**Help:** Any student needing help should take full advantage of instructors during her/his office hours or by appointment. **Students should give an honest and exhaustive effort and have her/his questions clearly formulated BEFORE seeking help.**

**Labs:** The laboratory is a required and integrated part of the course, and counts 20% towards your grade. **A passing grade (60%) in the laboratory is required to pass the course.** See the lab manual and listen to your lab instructor for rules and grading procedures. Take the lab seriously and do well - the lab can greatly affect your overall grade. **NO LATE LABS ARE ACCEPTED and you must not be late to the lab - attendance will be taken.**

**Exams:** There are three 1-hour exams during the semester and one two-hour final exam. No makeup exam. **The final exam is mandatory and comprehensive.** The exams are closed-book and closed-note. A sheet of "useful equations" will be provided with your exam, but please note that having equations available does not guarantee success – understanding the physics is the key. Try to study the concepts and how to apply them; **do not** just try to memorize how to solve particular problems. **Make-up exams are given only in extraordinary circumstances and only with prior arrangement.**

**Grading:** Grades are determined on a 1000 point scale as shown below. You cannot get a good grade in the course unless you do all the homework, take all the exams, and do well in the laboratory. You must pass the laboratory to pass the course.

A	A-	B+	B	B-	C+	C	D	F
930- 1000	900- 929	870- 899	830- 869	800- 829	770- 799	700- 769	600- 699	Below 600

**Available points:**

Exams: 300 points;  
Final exam: 200 points  
Laboratory: 200 points \*;  
Homework: 300 points;  
Total available: 1000 points.

\* A passing grade in laboratory is required to pass the course.

**Plagiarism:** Plagiarism and cheating are serious offenses and may be punished by failure on the exam, paper or project; failure in the course; and/or expulsion from the university.

**Note:** If you have any condition such as a physical or learning disability, which will make it difficult for you to carry out the work as I have outlined it or which will require academic accommodations, please notify me.

**Honor Code:** I encourage students to work collaboratively; however, cheating is a serious offense. Please read and understand your University of Mary Washington Honor

## Written Homework Procedure

Please write your name on the front page. Staple multiple pages together. Start each problem on a new page.

1. Organize the problem.
  - Write out knowns and unknowns if possible.
  - Think about what are you trying to solve for?
  - Draw a diagram, if relevant
2. Determine how you are going to solve the problem.
  - Always write out the full equations before plugging in any values.
3. Solve and manipulate equations.
  - Try as often as possible to solve using variables only. Often variables cancel out!
  - Lay out your work in a manner that is easy to follow. I will take off points if I can't read your solution.
  - Plug in numerical values
  - DO NOT FORGET UNITS AND DIRECTIONS (if a vector)
  - Circle/box your answer
4. Think about your answer. Does your answer seem reasonable?
  - You don't need to write anything for this.
  - Think about your value. Does it seem about the right order of magnitude? Does the sign (+/-) make sense?

### \*\*\*\*\*Reminder\*\*\*\*\*

You are welcome to help each other and/or get help from office hours. However, each solution must be your own. Remember that your test questions will be similar to your written homework problems. Make sure you understand how to solve these problems on your own. Good luck!!

### Tentative Course Schedule: University Physics 105, Fall 2016

Week	Date	Lecture topic	Textbook Reading	Labs
1	8/29 (M)	1. Intro, Measurements and Units	1.1	
	8/31 (W)	2. Significant figures, 1-D motion	1.1,2.1-2.3	
	9/02 (F)	3. Motion in 1-D continued	2.4-2.6	
2	9/05 (M)	<b>University Holiday (no class)</b>		
	9/07 (W)	4. Vectors and scalars	3.1-3.3	
	9/09 (F)	5. Motion in 2-D and 3-D	4.1-4.5	
3	9/12 (M)	6. Newton's 1 <sup>st</sup> and 2 <sup>nd</sup> laws	5.1-5.2	#1
	9/14 (W)	7. Applications	5.3	
	9/16 (F)	8. Newton's 3 <sup>rd</sup> law, inclined planes	5.3	
4	9/19 (M)	9. Friction	6.1	#2
	9/21 (W)	10. Circular motion, <i>Review</i>	6.3	
	9/23 (F)	<b>Exam #1</b>		
5	9/26 (M)	11. KE energy and work	7.1-7.4	#3
	9/28 (W)	12. Work and Power	7.5-7.6	
	9/30 (F)	13. Potential energy	8.1	
6	10/03 (M)	14. Work and Potential energy	8.1-8.3	#4
	10/05 (W)	15. Conservation of Energy	8.4-8.5	
	10/07 (F)	16. Center of Mass	9.1	
7	10/10 (M)	17. Linear momentum	9.2-9.3	#5
	10/12 (W)	18. Collisions	9.4-9.8	
	10/14 (F)	19. Rotational motion	10.1-10.3	
8	10/17 (M)	<b>Fall Break (no class)</b>		
	10/19 (W)	20. KE and moment of inertia, <i>Review</i>	10.4-10.5	
	10/21 (F)	<b>Exam #2</b>		
9	10/24 (M)	21. Torque	10.6-10.8	#6
	10/26 (W)	22. Rolling Motion	11.1-11.4	
	10/28 (F)	23. Angular momentum	11.5-11.9	
10	10/31 (M)	24. Static equilibrium	12.1-12.2	#7
	11/02 (W)	25. Equilibrium and elasticity	12.3	
	11/04 (F)	26. Universal law of gravity	13.1-13.7	
11	11/07 (M)	27. Fluid Statics	14.1-14.5	#8
	11/09 (W)	28. Fluid dynamics	14.6-14.7	
	11/11 (F)	29. SHM Pendulums	15.1-15.4	
12	11/14 (M)	30. Mechanical Waves	16: 1,2,6,5,7	#9
	11/16 (W)	31. Sound waves, <i>Review</i>	17: 2,3,5-7	
	11/18 (F)	<b>Exam #3</b>		
13	11/21 (M)	<b>Thanksgiving (no class)</b>		
14	11/28 (M)	32. Temperature and heat	18: 1,2,4	#10
	11/30 (W)	33. 0 <sup>th</sup> and 1 <sup>st</sup> Law of Thermodynamics	18.5	
	12/02 (F)	34. Ideal gas law	19.1, 19.2	
15	12/05 (M)	35. Conservation of energy	19: 4, 7, 8	
	12/07 (W)	36. Entropy and 2 <sup>nd</sup> Law	20.1-20.4	
	12/09 (F)	37. <i>Review</i>		
16	12/12(M)	<b>Final Exam</b>		

### Tentative schedule for the HW: University Physics 105, Fall 2016

W-HW	Given on	Due date			Points	Total	Chapters		
		Date	Day	Time					
1	8/29	9/5	Monday	4:45 PM	20	20	1,2	week1	
2	9/5	9/12	Monday	4:45 PM	20	40	3,4	week2	
3	9/12	9/19	Monday	4:45 PM	30	70	5	week3	
4	9/19	9/26	Monday	4:45 PM	20	90	6	week4	
5	9/26	10/3	Monday	4:45 PM	20	110	7, 8.1	week5	
6	10/3	10/10	Monday	4:45 PM	20	130	8, 9.1	week6	
7	10/10	10/17	Monday	4:45 PM	20	150	9	week7	
								week8	
8	10/24	10/31	Monday	4:45 PM	40	190	10,11	week9	
9	10/31	11/7	Monday	4:45 PM	20	210	12,13	week10	
10	11/7	11/14	Monday	4:45 PM	20	230	14,15	week11	
11	11/14	11/21	Monday	4:45 PM	30	260	16,17	week12	
	11/21	Thanksgiving							week13
12	11/28	12/5	Monday	4:45 PM	20	280	18, 19.2	week14	
13	12/5	12/12	Monday	4:45 PM	20	300	19, 20	week15	

Dr. Magrakvelidze ☺

	Monday	Tuesday	Wednesday	Thursday	Friday
7:00					
8:00	General Physics Jepson 219		General Physics Jepson 219		General Physics Jepson 219
9:00		Univ.Physics Lab Jepson 217		Gen.I Phys. Lab Jepson 217	
10:00	Univ.Physics Jepson 219		Univ.Physics Jepson 219		
11:00	OFFICE HOUR	OFFICE HOUR			
12:00	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
1:00			Gen.I Phys. Lab Jepson 217		
2:00		General Physics Jepson 217		General Physics Jepson 217	
3:15	OFFICE HOUR			OFFICE HOUR	
4:00					
5:00					