Winter 2018

Physics 2170 UNIVERSITY PHYSICS FOR SCIENTISTS I

Physics 2175 UNIVERSITY PHYSICS FOR ENGINEERS I

TIME (lectures): T, Th 5:30 PM– 6:45 PM. **ROOM:** 2009 Science Hall

TEXT: University Physics Volume 1. Can be freely downloaded from https://openstax.org/details/books/university-physics-volume-1

LECTURER: Zhixian Zhou

TELEPHONE: 313-577-2751 **OFFICE:** 243 Physics Building

E-MAIL: zxzhou@wayne.edu

COURSE WEB PAGE: WSU Blackboard

OFFICE HOURS: T: 1:30 PM – 2:30 PM in Room 243, Physics Building.

LABORATORY: PHY 2171 is the laboratory portion of PHY 2170 (for scientists). It is a co-requisite of PHY 2170 and, thus, is mandatory for you to be enrolled in both courses concurrently. However, laboratory is treated as a separate part of the course with its own grades and procedures which will be explained by your laboratory instructor. The experiments provide tangible demonstration and reinforcement of the ideas presented in this course. In addition, the laboratory is meant to show the importance of experiments in science. *Lab sections of PHY 2171 will start in the second week of the semester.* PHY 2171 is not a co-requisite for PHY 2175 students (for engineers).

DISCUSSION SECTIONS: Discussion sections meet once per week and are important. They allow you to meet together in small groups to ask questions, discuss lecture material, discuss assigned practice problems, etc. **Homework assigned practice problems will be posted chapter by chapter on Blackboard as the course progresses.** The practice problems are intended to test your understanding of the course material. In the same way you must practice to become proficient at a sport or musical instrument, you must work problems in order to master basic physics. *It is very important that you work out the solutions to each problem, and understand clearly the correct method of solution. It will be difficult to obtain a good grade in this course without making a conscientious effort to do all of the homework assignments.* Discussion section instructors, by using a few examples, are there to help students to understand the problems and to learn problem solving skills. However, they may not have time to do all the problems in details. It is student's responsibility to work on all the practice problems. You will have the opportunity to earn up to **70 points** towards your course grade for your performance in the discussion sections with 60 points reserved for the quizzes and 10 points for attending the discussion sections. *No individual make-up quizzes will be given.*

Quiz Sections	CRN	Instructor	Room
T 03:30PM - 05:20PM	23665-001 and 23666-001	Asllanaj	124 Manoogian
T 07:00PM - 08:50PM	23667-002 and 23668-002	Siehl	028 Manoogian
Th 07:00PM - 08:50PM	23671-003 and 23672-003	Siehl	021 Manoogian
Th 03:30PM - 05:20PM	23669-004 and 23670-004	Siehl	079 Manoogian

EXAMS: There will be three mid-term 50-minute exams in class, consisting of multiple choice questions (no partial credit). The lowest exam score may be replaced by half of your earned score on the Final Exam. Therefore, no makeup exams will be given. You MUST bring your Wayne State ID to the exam and present it to a proctor when asked during the exam. **A group photograph of the class will be taken during each exam.** No electronic devices (other than a calculator) are allowed in the room during the exam (**no iPads, headphones, cell-phones, etc**.)

GRADING: Your course grade will be determined by your performance in three midterm Exams, Discussion Section results, a cumulative Final Exam and attendance in class. The Final Exam will cover the material presented during the entire semester. The overall course grade will be determined on the basis of the following distribution:

Three In-class 50 Minute Exams (100 points each)	300 points
Quizzes (best 6), attendance in discussion sections	70 (60+10) points
Final Exam	200 points
Attendance in class [In-class quiz]	30 points
Total	**600 points**

Points accumulated	Percent	Grade
540-600	91-100	A
510-539	85-90	A-
480-509	80-84	B+
450-479	75-79	B
420-449	70-74	B-
390-419	65-69	C+
360-389	60-64	C
330-359	55-59	C-
300-329	50-54	D+
270-299	45-49	D
240-269	40-44	D-
0-239	0-39	F

ADDITIONAL STUDY HELP: If you have difficulty doing homework or lab work, or understanding some of the course material, you can get help from the *Physics Resource Center*, in room 172 Physics Building (the center will open in a couple of weeks after the beginning of the semester).

WITHDRAWAL DEADLINE: The course withdrawal deadline for our course will be Sunday, March 25. Any course withdrawal request in Academica after March 25 will be automatically denied.

LEARNING OBJECTIVES/OUTCOMES: At the successful completion of this course, you will be able to apply basic laws of physics to analyze real-life situations as well as unstructured situations ("word problems") both descriptively and numerically.

ACADEMIC INTEGRITY: All forms of academic dishonesty are forbidden in this class. Examples of academic dishonesty include all variations of cheating during exams as well as changing test answers for re-grading. Continuing to write after the exam time is up will result in the grade of zero for that exam. All forms of academic dishonesty will be prosecuted to the fullest extent as outlined in the Student Due Process Policy of the University.

Excerpts from the University's Student Due Process Policy regarding disruptive behavior are outlined below. This policy will be enforced during all academic activities relating to PHY 2170/2175 especially lecture and discussion sections. A student who is being disruptive in discussion section will lose 10 points per occurrence from their total score. A student who is disruptive during lecture runs the risk of losing one exam score. Repeat offenders will have their course grade down-graded and if necessary, they will receive an F for the course. Lastly, a student may be brought before the Dean of his or her College for further action.

The most important consequence of cheating/plagiarism or any other form of academic dishonesty, whether or not it is detected, is that you will not be able to do the work, and moreover you will not have the confidence that you can do that part of the course work. The ability to step up in the outside world and say with confidence, "I can do that" is surely one of the primary benefits of a college-level course, and is the source of many of the other benefits. You may "get away" with cheating once or even more than once, but the main penalty, far worse than any grade punishment, is that your college education, which is one of the best things you can do for yourself, will not have the benefits you are looking for.

Wayne State University – STUDENT DUE PROCESS POLICY

1.0 PREAMBLE

1. As provided by the Board of Governors in WSUCA 2.31.01, "Student Rights and Responsibilities," and as mandated by academic tradition, the students of Wayne State University possess specific rights and responsibilities. Students are expected to conduct themselves in a manner conducive to an environment, which encourages the free exchange of ideas and information. Students, as integral members of the academic community, have the right to the assurance that their rights are protected from arbitrary and capricious acts on the part of any other member of the academic community. This Student Due Process Policy is designed to assure that students who are alleged to have engaged in unacceptable conduct receive fair and impartial consideration as specified in this policy.

4.0 PROHIBITED CONDUCT

The following conduct is subject to disciplinary action when it occurs on University premises, or in connection with a University course or University documents, or at a University-

sponsored activity:

4.1 All forms of academic dishonesty.

4.3 Physical abuse of another person, or conduct which threatens or endangers another, or verbal or physical threats which cause reasonable apprehension of harm.

4.6 Disorderly behavior that interferes with activities authorized, sponsored, or permitted by the University such s teaching, research, administration, and including disorderly behavior that interferes with the freedom of expression of others.

5.0 DISCIPLINARY SANCTIONS

Students found to have committed an act, or acts of misconduct may be subject to one or more of the following sanctions, which shall take effect immediately upon imposition, unless otherwise stated in writing, except as provided in this policy.

5.1 Disciplinary Reprimand. Notification that the student has committed an act of misconduct, and warning that another offense may result in the imposition of a more serious sanction.

5.2 Disciplinary Probation. A disciplinary status which does not interfere with the student's right to enroll in and attend classes, but which includes specified requirements or restrictions (as, for example, restrictions upon the student's representing the University in any extracurricular activity, or running for or holding office in any student group or organization) for a specific period of time as determined in the particular case.

5.3 Suspension. A denial of the privilege of continuing or enrolling as a student anywhere within the University, and denial of any and all rights and privileges conferred by student status, for a specified period of time. At the termination of the suspension the student will be entitled to resume his/her education without meeting any special academic entrance requirements.

5.4 Expulsion.

5.5 Restitution.

5.6 Transcript disciplinary Record.

5.7 Other Sanction.

10.0 PRELIMINARY PROCEDURE

10.1 When a faculty member is persuaded that academic dishonesty has occurred, the faculty member may, without using the mechanism of filing a charge, adjust the grade downward (including downgrading to a failing grade) for the test, paper, or other course-related activity in question, or for the entire course.

STUDENT DISABILITY SERVICES: If you have a documented disability that requires accommodations, you will need to register with Student Disability Services (SDS) for coordination of your academic accommodations. The Student Disability Services (SDS) office is located at 1600 Undergraduate Library in the Student Academic Success Services department. SDS telephone number is 313-577-1851. Once you have your accommodations in place, I will be glad to meet with you privately during my office hours to discuss your special needs. Student Disability Services' mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity to fully participate in their educational experience at Wayne State University.

Please be aware that a delay in getting SDS accommodation letters for the current semester may hinder the availability or facilitation of those accommodations in a timely manner. Therefore, it is in your best interest to get your accommodation letters as early in the semester as possible.

TIPS FOR SUCCEEDING IN INTRODUCTORY PHYSICS:

There is no "secret" to succeeding at Introductory Physics. The things you must do to achieve your best results are amazingly clear and should not be unknown to you. Previous experience with many, many students has shown the following traits/habits seem to be common to most students who excel in the introductory physics course.

1.**Come to class.** At every university I have been associated with studies have been taken to find out what best predicts student success. Regular class attendance is the thing that is most associated with student success. Perhaps this is obvious, but many students do not show up and wonder why they are doing poorly.

2.**Get a book.** Read it. Use it. There are LOTS of very good hints and ideas in the Preface. Most students do not read the Preface, but in it the authors have given you their best advice on how to use the text successfully.

3.**Actually read the text.** This is preferably done before the class lecture, and if possible, afterward as well. Make sure you read the "Review and Summary" section at the end of each chapter – it is critical to summarize what you've learned.

4.**Put in the time.** The text book recommends (and we agree) that you should be spending at least 2 hours outside of the class for every hour of lecture. This is at least 6 hours per week. It is best to spend time both before class getting familiar with the material, and after class reviewing the material.

5.**Practice, practice, practice.** Do the assigned homework, and do book problems. You can watch Michael Jordan play basketball for 3 hours a day, every day, and you will never get better at basketball – not unless you yourself put in the practice.

6.**Strive for understanding.** Many students feel if they just "get the answer" from a TA or help center person, they have accomplished the task. This is incorrect. You have accomplished your task when you truly understand the problem, how to set it up, how to solve it, and what it is asking. Just completing the problem to get some random answer is not enough. Realize that we provide you the formulas you will need, thus memorization is not terribly helpful.

7.**Attend your instructor's office hours.** This will be most effective if you bring your book and your homework problems and ask him/her to help you identify your "sticking points." Open-ended statements like, "I don't get any of it," will not be helpful in this setting.

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Instructor: Zhixian Zhou

TENTATIVE CLASS SCHEDULE: (Subject to change, * indicates a suggested quiz week in discussion section)

Week	Date	Day	Lecture Topic	Reading Assignment
1	01/09 01/11	T Th	Unit conversions, estimates, Significant figures, scalars, components, Algebra and products of vectors	1.1 -2.4
2*	01/16 01/18	T Th	Position, displacement, velocity, acceleration, Constant acceleration, free fall	3.1-3.5
3*	01/23 01/25	T Th	Displacement, velocity and acceleration vectors, Projectile motion, circular and relative motions, Newton's first & second laws, mass and weight	3.6, 4.1 – 4.5, 5.1 – 5.4
4	01/30	T	Third law, free-body diagrams	5.5 – 5.7
	02/01	Th	**First Exam (Chapters 1 To 5)**	
5*	02/06 02/08	T Th	Solving problems with Newton's laws, Centripetal force, drag force and terminal velocity, Work, kinetic energy, work-energy theorem	6.1 – 6.4 7.1 – 7.3
6*	02/13 02/15	T Th	Power, potential energy, conservative forces, Conservation of energy, sources of energy, Linear momentum, conservation of momentum	7.4, 8.1 – 8.5, 9.1 – 9.3
7*	02/20 02/22	T Th	Collisions in multiple dimensions, center of mass, Rotation with constant angular acceleration, Moment of inertia, Newton's second law for rotation	9.4 – 9.7, 10.1 – 10.7
8	02/27 03/01	T Th	Work and power for rotational motion, Rolling motion and angular momentum, Conservation of angular momentum,	10.8, 11.1 – 11.4
9*	03/06	T	**Second Exam (Chapter 6 To 10)**	
	03/08	Th	Rrecession, static equilibrium, Examples of static equilibrium, stress, strain and elasticity	12.1-12.4
10*	03/20 03/22	T Th	Law of universal gravitation, gravitational potential energy and total energy, Satellite orbits, Kepler's laws, Tidal forces, Fluids,	13.1 – 13.6, 14.1-14.3

			density, pressure, Pascal's principle	
11*	03/27 03/29	T Th	Archimedes principle, Bernoulli's equation, viscosity, Simple harmonic motion, circular motion	14.4 – 14.7, 15.1 – 15.3
12	04/3	T	Pendulums, Traveling Waves, stretched string	15.4 – 15.6, 16.1 – 16.3
	04/5	Th	**Third Exam (Chapter 11 To 14)**	
13*	04/10 04/12	T Th	Energy, power and interference of waves, resonance, Sound waves, speed, intensity, normal modes, Sources of sound, beats, Doppler effect	16.4 – 16.6, 17.1 – 17.7
14	04/17 04/19	T Th	Catch up, Review and Evaluation	

Thursday, April 26, 2018 Final Exam (5:30 PM – 7:30 PM; 2009 Science) Cumulative