University of Florida | Department of Physics

PHY 2004, Section 2905
Applied Physics 1 – Spring 1995

Lectures:	Mon., Wed., Fri. period 2 (8:30–9:20 a.m.) in 100–A Williamson Hall
Textbook:	*Technical Physics* by F. Bueche (4th ed., Wiley, 1994)
Reference Books:	*Applied Physics* by A. Beiser (Schaum's Outline Series)
(optional)	*College Physics* by F. Bueche (Schaum's Outline Series)
Instructor:	Prof. Kevin Ingersent, 264 Williamson Hall (392–0521)
Office Hours:	Mon., Fri. 9:30–10:30 a.m., Wed. 3:00–4:00 p.m., or by appointment
Dept. Chair:	Prof. Neil S. Sullivan, 215 Williamson Hall (392–0521)

Aim: This course will be a survey of basic physics and some of its practical applications to the world around us. Topics in mechanics, properties of materials, heat and vibratory motion will be covered. The principal goal will be to show how physical principles and scientific ways of thinking can be turned to many real-life situations. The problem-solving skills you pick up should prove useful in your own field of specialization. I also hope that the course will help you become a more informed consumer of science and technology in general.

Your job: You should attend lectures to learn about the basic concepts and how to apply them in solving problems, and also to hear any special announcements. Since there is a lot to be squeezed into just three hours of class per week, it is essential that you read the textbook concurrently with the lectures to deepen your understanding of physical principles. Finally, you should work diligently at the homework assignments, which — although they are not collected or graded — form a key part of the course.

Problem-solving: This provides a good measure of your understanding of basic principles by testing your ability to combine different physical concepts as they apply to unfamiliar situations — something which is crucial if you are ever to apply physics to the world around you. Problem-solving is a skill that has to be be developed, and everyone benefits from practice. *Your grade in this course will be based solely on your success at solving problems in the mid-term and final exams,* so there will be a direct payoff for your effort. You should be capable of earning an average grade on the course if you have successfully worked through all the homework problems assigned on page 3. If you are aiming for a B or better, you should expect to do additional problems.

Try each problem on your own first. Consult your notes or the textbook for statements of basic principle or fundamental equations, which you aren't expected to memorize, even for the exams. If you get stuck, talk the problem over with a friend, come to see me during office hours, or — in the case of an assigned homework problem — look up the solution in the course handout. Whenever you need help to complete a problem it is essential, though, that you consolidate your new understanding by successfully doing another problem of the same type *by yourself.* Don't despair if you seem to make a lot of mistakes at the start. A successful physicist is just somebody who has made all the possible mistakes in the past and has learned how to avoid repeating most of them!

Exams: There will be three mid-term exams and a comprehensive final, each in multiple-choice format. You must bring photo ID and a No. 2 pencil to each exam. You may also bring a formula sheet and a calculator, but no other materials.

The exams will emphasize physical reasoning rather than memorization of facts. This reasoning will be developed by steady work over the entire semester, not by last-minute cramming. During the later stages of your preparation for each exam, you may want to work through the corresponding sample exams in the course handout. You will find that a significant number of the questions are closely based on homework problems. However, the exam questions are not grouped chapter-by-chapter, so you may need practice in identifying which principles are being tested in each problem. Also, there are a few true/false questions of a type that does not appear in the homework. Solutions to the sample exams are provided in the handout, but by this stage you should need them mostly just to check your answers.

Grades: The best two mid-term scores will each count 30% towards your overall score on the course. The other mid-term will count either 0% or 15%, depending on your final exam score. If the final exam score exceeds your lowest mid-term score, the mid-term counts 0% and the final counts 40%; otherwise the mid-term counts 15% and the final counts 25%.

Letter grades will be assigned by curving the overall scores. The grade ranges vary slightly from semester to semester, but the following are typical:

0–34	E	35–39	D
40–44	D+	45–54	C
55–64	C+	65–72	B
73–79	B+	80–100	A

Make-ups: No make-up exams will be offered during the regular semester. In event of a documented conflict with another exam, a mid-term may be taken shortly before or after its scheduled time. If you have a medical or urgent family reason for missing a mid-term, supported in writing by a qualified professional, you may ask to take a make-up covering all of Chapters 1–15 during the week prior to finals. *Students with an excused absence from the final, or from more than one mid-term, will receive an incomplete for the course. All others will receive a grade based on a score of zero in any exam they have missed.*

Help services: If you are encountering difficulties with the course, I encourage you to make use of my office hours. (If your schedule prevents you from attending, please contact me for an appointment at a more convenient time.) In addition, the Student Teaching Center in Broward Hall (tel. 392–2010) offers a range of services, including individual tutoring in physics.

Course outline: The day-by-day schedule which follows is provided for guidance only. Changes may be announced in class.

Date	Chapter(s)	Topic	Suggested Problems
Jan 9		Introduction	
Jan 11	1	Vectors	3,11,17,22,23,31,34,35,37,39,43,44,47
Jan 13	2	Motion	5,7,17,23,27,30–32,35,37,44,50,52–54
Jan 16		NO CLASS — Martin Luther King Day	
Jan 18	2	Motion (cont.)	
Jan 20,23	3	Newton's Laws	2,5,10,18,22,25,27,30,31,36,38,39,43
Jan 25,27	4	Friction	3–5,9,13,14,19,25,27,29
Jan 30, Feb 1,3	8	Statics	3,5,7,13,15,17,19–21,26,32,37,43
Feb 6	1–4, 8	Catch-Up or Review	
Feb 7	1–4, 8	**EXAM 1 — 5:10–7:10 p.m., venue to be announced**	
Feb 8,10	5	Work, Power and Energy	2,7,12,16,19,21,31,36,37,39,40,45
Feb 13,15	6	Simple Machines	2,3,5,7,11,15,18–20,22,26,33
Feb 17,20,22	7	Impulse and Momentum	2,5,11,17,21,22,26,29,30,36,39
Feb 24,27	9	Rotational Motion	3,8,11,16,17,21–23,25,30,35,38
Mar 1,3	10	Dynamics of Rotation	4,7,12,16,17,19,21,23,25,36,37
Mar 6,8,10		NO CLASS — Spring Break	
Mar 13	5–7,9,10	Catch-Up or Review	
Mar 14	5–7,9,10	**EXAM 2 — 5:10–7:10 p.m., venue to be announced**	
Mar 15,17,20	11	Properties of Materials	3,6,7,22,24–26,32,37,39–41,56
Mar 22,24	12	Temperature and Matter	2,11,17,19,21,23,26,29–31,34,38
Mar 27,29	13	Heat Energy and Its Effects	4,5,10,13,17,19,25,29,31,37
Mar 31, Apr 3	14	Intro. to Thermodynamics	2,6,10,13,14,17,23,27,32,36,39
Apr 5,7	15	Heat Transfer	2,4,7,13,15,17,20,23,28
Apr 10	11–15	Catch-Up or Review	
Apr 11	11–15	**EXAM 3 — 5:10–7:10 p.m., venue to be announced**	
Apr 12,14	16	Vibratory Motion	4–6,9,13,18,20,22,25,29
Apr 17,19	17	Waves	2,3,6,8,12,16,22–24
Apr 21,24	18	Sound	5,17,22,24,33,36
Apr 26,28	1–18	Catch-up or Review	
May 1	1–18	**FINAL — 5:30–7:30 p.m., venue to be announced**	