Physics 125
Physics for Engineers II
Fall Semester 2022

Course Description: Electricity, magnetism, electromagnetic waves, optics. Without lab. Accompanying optional problem-solving session: PHYS 123. *Prerequisites:* PHYS 031 and MATH 022 or MATH 023; concurrent enrollment in MATH 121.

Instructor: Dr. Malcolm Sanders
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Office Hours: MF (11:00 a.m. - Noon)
(or by arrangement)
(In person or on MS TEAMS, as you choose)

Class Hours: Lecture (90622): E102 Innovation, MWF 9:40-10:30 a.m.

Required Course Materials:

Textbook:

Physics for Scientists & Engineers: A Strategic Approach Plus Modern Physics, (includes MasteringPhysics), 5/E, Randall D. Knight, ISBN: 0137319495

This textbook bundle is available at the UVM Bookstore. Alternatively, if you wish, you can purchase a MasteringPhysics License with eBook, directly from the publisher. (Note: If you are continuing from last semester's Physics 31 A, B or C, you should be all set with your textbook, MasteringPhysics, and LearningCatalytics.)

MasteringPhysics Course ID: ***sanders51867***

Smartphone, Tablet or Laptop:

You will need a device that can support a web browser in class in order to participate in the *LearningCatalytics* exercises in lecture

Class Format:

Lecture:

The 50 minute MWF Lectures, will be a complement to your reading assignments. These periods will be used to help strengthen your conceptual understanding of the material, as well as to help you develop problem solving skills, through the use of conventional lecture format as well as interactive *LearningCatalytics* exercises. Your participation in the lecture exercises will affect your grade directly, as explained in the "Evaluation" section of the syllabus.

NOTE: The lectures are not a substitute for your textbook reading assignments. The purpose of the lecture is to help you understand the key points and to help clarify some of the more difficult aspects of the reading assignment. The lecture is not the place to encounter the material for the first time. To reinforce this idea, there will be at least one Mastering prelecture assignment for each of the chapters we cover in class.

Optional Problem Solving Session, Physics 123:

Physics 123 is an optional 1-credit course, meeting weekly on Tuesday afternoons devoted to discussing how to solve the Physics 125A homework assignments. If you feel that you might need some extra help in this regard, consider adding this course.

Note on ***MasteringPhysics***:

Your account information from physics 31 should still be valid to access the MasteringPhysics section of this course. Log in at www.masteringphysics.com and join our course at ***sanders51867***. If you are just starting out with MasteringPhysics, you will need to provide the access credentials provided with your textbook license to gain access.

Physics 125 Fall 2022 Lecture Schedule

The following is a tentative list of dates and allocations of time to be devoted to each of the relevant chapters and sections of the textbook. It is very important that you read the material in the textbook *before* coming to the lectures that are scheduled to cover this material. In lectures, I will assume that you will already have some familiarity with the new terms and concepts that are presented in each of the chapters. There will often be *LearningCatalytics* questions in lecture for which you may need to rely on your knowledge of the reading material. It will also be useful for you to have attempted, or at least looked at, the homework problems for the chapter we are covering, before you come to lecture.

Check the Physics 125 Blackboard site to make sure we're still on schedule.

Date			Topic	Reading Assignment
Aug	29	M	***Introduction; Electric Charges and Forces.***	*Chap. 22, §1–2*
	31	W	***Electric Charges and Forces, cont'd.***	*Chap. 22, §3–4*
Sep	2	F	***The Electric Field.***	*Chap. 22, §5, Chap. 23, §1*
Sep	5	M	***Labor Day – No class***	
	7	W	***The Electric Field.***	*Chap. 23, §2–3*
	9	F	***The Electric Field, cont'd.***	*Chap. 23, §4–5*
Sep	12	M	***The Electric Field, cont'd.***	*Chap. 23, §6-7*
			[Last Day to Add/Drop]	
	14	W	***Gauss's Law.***	*Chap. 24, §1–3*
	16	F	***Gauss's Law, cont'd.***	*Chap. 24, §4–6*
Sep	19	M	***The Electric Potential.***	*Chap. 25, §1–3*
	21	W	***The Electric Potential, cont'd.***	*Chap. 25, §4–7*
	23	F	***Potential and Field***	*Chap. 26, §1–2*
Sep	26	M	**Exam 1: on assigned material from Chapters 22–24**	
	28	W	***Potential and Field.***	*Chap. 26, §3-4*
	30		***Potential and Field, cont'd.***	*Chap. 26, §5–7*
Oct	3	M	***Current and Resistance.***	*Chap. 27, §1–2*
	5	W	***Current and Resistance, cont'd***	*Chap. 27, §3–5*
	7	F	***Fall break – No class***	
Oct	10	M	***Electric Circuits***	*Chap. 28, §1–3*
	12	W	***Electric Circuits, cont'd.***	*Chap. 28, §4–6*
	14	F	***Electric Circuits, cont'd.***	*Chap. 28, §7–9*
Oct	17	M	***The Magnetic Field***	*Chap. 29, §1-3*
	19	W	***The Magnetic Field, cont'd.***	*Chap. 29, §4–6*
	21	F	***The Magnetic Field, cont'd.***	*Chap. 29, §7–10*
Oct	24	M	**Exam 2: on assigned material from Chapters 25 – 28**	
	26	W	***Catch up***	
	28	F	***Electromagnetic Induction.***	*Chap. 30, §1–3*
Oct	31	M	***Electromagnetic Induction, cont'd.***	*Chap. 30, §4–6*
			[October 31 is also the last day to withdraw from courses.]	
Nov	2	W	***Electromagnetic Induction, cont'd.***	*Chap. 30, §7–8*
	4	F	***Electromagnetic Induction, cont'd.***	*Chap. 30, §9–10*

... schedule cont'd.

Date			Topic	Reading Assignment
Nov	7	M	***Electromagnetic Fields & Waves***	*Chap. 31, §1–3* Review: *Chap. 20, §1–5*
	9	W	***Electromagnetic Fields & Waves, cont'd.***	*Chap. 31, §4–6*
	11	F	***Wave Optics***	*Chap. 33, §1–3* Review: *Chap. 17, §1,5,6*
Nov	14	M	**Exam 3: on assigned material from Chapters 29 – 31**	
	16	W	***Wave Optics, cont'd.***	*Chap. 33, §4–6*
	18	F	***Ray Optics***	*Chap. 34, §1–3*
Nov	21–25		Thanksgiving Break	
	28	M	***Ray Optics,cont'd***	*Chap. 34, §4–6*
	30	W	***Ray Optics,cont'd***	*Chap. 34, §7–8*
Dec	2	F	***Optical Instruments***	*Chap. 35, §1–3*
Dec	5	M	***Optical Instruments cont'd***	*Chap. 35, §4–5*
	7	W	***Catch up, Evaluations.***	
	9	F	***Summary and Review.***	
Dec	16	F	**Final Examination: Comprehensive** **10:30 am – 1:15 pm., E102 Innovation**	

Physics 125 - Assigned Questions, Exercises and Problems

Complete the assignments by the dates shown. Most of the assigned problems will appear on the ***MasteringPhysics*** *assignment due at midnight of the due date for the homework assignment.*

Most of the questions on examinations and quizzes will be problems adapted from the homework assignments. However, there will also be some questions aimed at probing conceptual understanding in other ways; these will be of the True/False, multiple choice, or short answer format.

The following **assigned conceptual questions (CQ) and exercises and problems (E&P) should to be completed by the dates shown**. Most of these will appear in your MasteringPhysics weekly homework sets.

Due Date	***Chap.***	***Assigned Questions, Exercises and Problems***
Sep 9	22	CQ: 13, 14, 15 E&P: 17, 18, 26, 33, 35, 38, 53, 64, 65
Sep 16	23	CQ: 4, 6, 7, 15 E&P: 9, 14, 29, 39, 42, 47, 54, 58, 59, 73
Sep 23	24	CQ: 5, 6, 7 E&P: 12, 20, 26, 37, 42, 45, 55, 58
Sep 30	25	CQ: 1, 5, 11, 12 E&P: 5, 24, 31, 41, 43, 54, 61, 74, 82
Oct 7	26	CQ: 4, 6, 8, 10 E&P: 4, 7, 23, 27, 40, 45, 47, 62, 63, 64, 68, 80
Oct 17*	27	CQ: 7, 8, 9 E&P: 9, 17, 37, 42, 51, 54, 59, 75
Oct 21	28	CQ: 4, 5, 6, 9, 10 E&P: 17, 18, 25, 36, 41, 52, 53, 56, 80, 81
Oct 28	29	CQ: 4, 5, 6, 7 E&P: 12, 22, 26, 33, 38, 48, 55, 56, 59, 82
Nov 4	Take a break to catch up	
Nov 11	30	CQ: 1,6, 8, 9, 11, 14 E&P: 14, 32, 35, 37, 40, 56, 76, 77, 82
	31	CQ: 1, 7, 8, 10 E&P: 14, 26, 29, 32, 47, 50, 64
Nov 27*	33	CQ: 2, 3, 5 E&P: 15, 17, 22, 39, 41, 53, 65, 69
Dec 2	34	CQ: 3, 7, 10 E&P: 2, 25, 42, 46, 51, 56, 58, 65
Dec 9	35	CQ: 3, 7, 9 E&P: 2, 10, 11, 26, 33, 48

* due dates are Friday nights, except where noted, in which case the due date has been pushed to the end of the break/vacation.

Physics 125 - Evaluation

Your final grade in Physics 125 will be determined by your performance on the hour exams and the final exam, your lab work, your MasteringPhysics homework and prelecture assignments and your lecture participation via *LearningCatalytics* according to the following table:

LearningCatalytics(lecture)	***15%***
MasteringPhysics(homework)	***25%***
MasteringPhysics(prelecture)	***10%***
Exam 1 (9/26)	***10%***
Exam 2 (10/24)	***10%***
Exam 3 (11/14)	***10%***
Final Exam (12/16 – 10:30 am - 1:15 pm)	***20%***

Students will be expected to take examinations at the scheduled times. A grade of zero will be recorded for a missed hour examination or final examination *unless circumstances beyond the student's control prevent participation at the scheduled time*. If you anticipate a problem, see me as far in advance as possible. Documented evidence of such circumstances will be required in order to schedule a makeup for an hour examination or for the final examination.

MasteringPhysics Homework is due by the deadline given for each assignment (usually Friday night 11:59 p.m.). No credit will be given for work submitted after the deadline.

MasteringPhysics prelecture assignments will be due by 9:00 a.m. on the lecture day that the assignment is due.

Participation in LearningCatalytics during lecture is not permitted if you are not physically present in the lecture hall. If you do otherwise, it will be considered a violation of the UVM academic honesty policy. There will be no formal excused class absences, but when I average the LearningCatalytics scores at the end of the semester, I will knock three class days off the total number of possible points for the purpose of determining your LearningCatalytics grade. This means that you can theoretically miss six days of class and still get 100% for your LearningCatalytics score. If you have perfect attendance, then you can get extra credit.

Students who are concerned about their performance in the course are encouraged to discuss the matter with their instructor. Please note that Monday, October 31, is the last day to withdraw from courses. Students who withdraw from Physics 125A must also withdraw from the associated problem solving course, Physics 123.

Students will be expected to comply with the University's Academic Honesty policy. No talking or other communication is permitted during quizzes or examinations.

Physics 125 exams will be "closed-book." No books or notes are to be brought into the examination; a student should bring only pen or pencil (and eraser) and a calculator. Exception: A formula sheet will be provided for each of the hour exams and the final exam.