PHY-252: UNIVERSITY PHYSICS II
COURSE SYLLABUS – SPRING 2025

Instructor:	Matthew Cochran
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Course Time:	Monday, Wednesday, and Friday from 9:30 to 10:20. Thursday 5:30 to 6:20. Monday, Wednesday, and Friday from 10:30 to 11:20. Thursday 1:00 to 1:50.
Office Hours:	After class (specific times will be announced) or by appointment
Prerequisites:	PHY-251. Concurrent enrollment in PHY-252L.
Text:	Randall D. Knight, *Physics for Scientists and Engineers: A Strategic Approach with Modern Physics*, 5th edition • Can buy eText through Pearson+ for around $11 per month • Do not buy eHomework (Mastering Physics) • Can use 3rd or 4th edition too • Copies are on reserve in the library
Other Materials:	Scientific calculator

COURSE DESCRIPTION:
This course is the second part of a two-semester introductory physics sequence focusing on the application of physical principles, logical reasoning, and mathematical analysis needed to understand a broad range of natural phenomena. Topics include classical electricity and magnetism, waves and optics, and modern physics.

EVALUATIONS AND GRADING SCALE:

Exam 1	20%
Exam 2	20%
Exam 3	20%
Homework and Quizzes	20%
Final	20%

90%	–	100%	A
80%	–	90%	B
70%	–	80%	C
60%	–	70%	D
0%	–	60%	F

EXAMS:
There will be four examinations as part of the requirements for the course. The exams will be, by necessity, cumulative. Physics is sequential and its concepts must be learned in order. Material for exams will be drawn primarily from homework problems. Hence, the best way to review for an exam is to review previous homework assignments. Make-up exams will only be given under extenuating circumstances beyond the student's control.

QUIZZES AND HOMEWORK:
A ten-minute quiz will be given most weeks. Quizzes may be given at the beginning of class, so arrive on time. Make-up quizzes are not given. To be successful in this course, it is essential that you complete all homework assignments. Be prepared to spend three hours or more on homework every week. If you are having trouble, get help from the instructor, the tutor, or your classmates. Do not fall behind. Homework is due at the beginning of class. Late homework is not accepted. In particular, homework over a week late is never accepted.

ATTENDANCE:
Regular attendance is expected of all students. Read material prior to lecture. If a topic is still not clear after it has been discussed in class, ask questions. Time will be spent working through homework problems and reviewing for exams in addition to lecturing. You will work with partners in class. It is important that partners engage in discussion of their work and avoid working as isolated individuals.

MARIANIST VALUES:
The Natural Sciences Division provides an *integral, quality education:* sophisticated integrative course content taught by experienced, dedicated, and well-educated instructors.

- We *educate in family spirit* – every classroom is an Ohana and you can expect to be respected yet challenged in an environment that is supportive, inclusively by instructors who take the time to personally get to know and care for you.
- We e*ducate for service, justice and peace,* since many of the most pressing global issues (climate change, health inequity, poverty, justice) are those which science and technology investigate, establish ethical parameters for, and offer solutions to.
- We *educate for adaptation and change.* In science and technology, the only constant is change. Data, techniques, technologies, questions, interpretations and ethical landscapes are constantly evolving, and we teach students to thrive on this dynamic uncertainty.

DISABILITY ACCESS:
If you need individual accommodations to meet course outcomes because of a documented disability, please speak with me to discuss your needs as soon as possible so that we can ensure your full participation in class and fair assessment of your work. Students with special needs who meet criteria for the Americans with Disabilities Act (ADA) provisions must provide written documentation of the need for accommodations from the Counseling Center by the end of week three of the class, in order for instructors to plan accordingly. If a student would like to determine if they meet the criteria for accommodations, they should contact the Kōkua ʻIke Coordinator at (808) 739-8305 for further information (ada@chaminade.edu).

TITLE IX COMPLIANCE:
Chaminade University of Honolulu recognizes the inherent dignity of all individuals and promotes respect for all people. Sexual misconduct, physical and/or psychological abuse will NOT be tolerated at CUH. If you have been the victim of sexual misconduct, physical and/or psychological abuse, we encourage you to report this matter promptly. As a faculty member, I am interested in promoting a safe and healthy environment, and should I learn of any sexual misconduct, physical and/or psychological abuse, I must report the matter to the Title IX Coordinator. If you or someone you know has been harassed or assaulted, you can find the appropriate resources by visiting Campus Ministry, the Dean of Students Office, the Counseling Center, or the Office for Compliance and Personnel Services.

WEEKLY SCHEDULE:

Week	Date	L#	Lecture Topic	4th ed
1	Jan 06	1	Intro; Simple harmonic motion	15.1
	Jan 08	2	Phase constant	15.2
	Jan 09	3	Energy in SHM; Dynamics; Pendulum	15.3 & 15.4
	Jan 10	4	Intro to waves	16.1 & 16.2
2	Jan 13	5	Sinusoidal waves	16.3
	Jan 15	6	Sound and light	16.5
	Jan 16	7	Power; Intensity; Decibels	16.8
	Jan 17	8	Superposition	17.1
3	Jan 20	**H1**	**Martin Luther King Jr. Day – No Class**	
	Jan 22	9	Standing waves; Waves on a string	17.2 & 17.3
	Jan 23	10	Waves in a pipe	17.4
	Jan 24	11	Interference in 1D	17.5
4	Jan 27	12	Interference in 1D	17.5
	Jan 29	13	Charge	22.1 to 22.3
	Jan 30	14	Coulomb's Law	22.4
	Jan 31	**E1**	**EXAM 1**	
5	Feb 03	15	Coulomb's Law in 2D	22.4
	Feb 05	16	The electric field	22.5
	Feb 06	17	Continuous charge distributions	23.1 to 23.5
	Feb 07	18	Electric field and force	23.6
6	Feb 10	19	Electric potential energy	25.1 & 25.2
	Feb 12	20	Electric potential; Potential in a capacitor	25.4 & 25.5
	Feb 13	21	Electric potential of point charges	25.6 & 25.7
	Feb 14	22	Connecting potential and field	26.1 to 26.3
7	Feb 17	**H2**	**Presidents' Day – No Class**	
	Feb 19	23	Batteries and capacitance	26.4 & 26.5
	Feb 20	24	Dielectrics	26.7
	Feb 21	25	Current and resistance	27.1
8	Feb 24	26	Circuits; Kirchhoff's Rules	28.1 & 28.2
	Feb 26	27	Series and parallel resistors	28.4 & 28.6
	Feb 27	28	Review	
	Feb 28	**E2**	**EXAM 2**	

WEEKLY SCHEDULE:

Week	Date	L#	Lecture Topic	4th ed
9	Mar 03	29	Resistor circuits; Ground	28.7 & 28.8
	Mar 05	30	RC Circuits	28.9
	Mar 06	31	Power	28.3
	Mar 07	32	Magnetism	29.1
10	Mar 10	33	Fields from current	29.2
	Mar 12	34	Magnetic force on a moving charge	29.7
	Mar 13	35	Field from a solenoid	29.6
	Mar 14	36	Magnetic force on wires	29.8
-			Spring Break	
11	Mar 24	37	Magnetic force on wires	29.8
	Mar 26	**H3**	**Prince Kuhio Day – No Class**	
	Mar 27	38	Magnetic flux; Lenz's Law	30.3 & 30.4
	Mar 28	39	Faraday's Law	30.5
12	Mar 31	40	Interference in 2D	17.7
	Apr 02	41	Interference in 2D	17.7
	Apr 03	42	Interference of light	33.1 & 33.2
	Apr 04	**E3**	**EXAM 3**	
13	Apr 07	43	The diffraction grating	33.3
	Apr 09	44	Single slit diffraction	33.4
	Apr 10	45	Reflection and refraction	34.1 to 34.4
	Apr 11	46	Ray tracing; Lenses	34.5 to 34.6
14	Apr 14	47	Mirrors	34.7
	Apr 16	48	Vision	35.3
	Apr 17	49	Photoelectric effect	38.1 & 38.2
	Apr 18	**H4**	**Good Friday – No Class**	
15	Apr 21	50	Photons	38.3
	Apr 23	51	Energy quantization	38.4 & 38.5
	Apr 24	52	Bohr atom	38.6
	Apr 25	53	Hydrogen spectrum	38.7
Wed	Apr 30	**FE**	**11:00 to 1:00 – FINAL EXAM (9:30 section)**	
Tue	Apr 29	**FE**	**11:00 to 1:00 – FINAL EXAM (10:30 section)**	

COURSE LEARNING OUTCOMES:
Upon successful completion of the course, students will demonstrate:

1. Solve given problems involving electricity and magnetism using algebra and trigonometry.
2. Solve given problems involving light and optics using algebra and trigonometry.
3. Solve given problems involving quantum physics using algebra and trigonometry.

PROGRAM LEARNING OUTCOMES
Students completing a minor in physics will be able to:

1. Apply quantitative reasoning and appropriate mathematics to describe phenomena in the natural world.
2. Interpret multiple scientific representations, including verbal descriptions, diagrams, graphs, formulas, and translate between them.
3. Apply physics principles to understand living systems, scientific instrumentation, and everyday experiences.

CREDIT HOUR POLICY:
The unit of semester credit is defined as university-level credit that is awarded for the completion of coursework. One credit hour reflects the amount of work represented in the intended learning outcomes and verified by evidence of student achievement for those learning outcomes. Each credit hour earned at Chaminade University should result in 45 hours of engagement. This equates to one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for approximately fifteen weeks for one semester, 10 week term, or equivalent amount of work over a different amount of time. Direct instructor engagement and out-of-class work result in total student engagement time of 45 hours for one credit.

The minimum 45 hours of engagement per credit hour can be satisfied in fully online, internship, or other specialized courses through several means, including (a) regular online instruction or interaction with the faculty member and fellow students and (b) academic engagement through extensive reading, research, online discussion, online quizzes or exams; instruction, collaborative group work, internships, laboratory work, practica, studio work, and preparation of papers, presentations, or other forms of assessment. This policy is in accordance with federal regulations and regional accrediting agencies.

Weekly:	3.5 hours seat × 15 weeks = 52.5 hours
	1.5 hours reading × 15 weeks = 22.5 hours
	5.0 hours homework × 15 weeks = 75.0 hours
Midterms:	7.0 hours study × 3 midterms = 21.0 hours
Final:	2.0 hours seat + 7 hours study = 9.0 hours

MUSIC DEVICES AND MOBILE PHONES:
Unless specifically permitted by your instructor, use of music devices and mobile phones is prohibited during all Natural Science and Mathematics classes at Chaminade, as it is discourteous and may lead to suspicion of academic misconduct. Students unable to comply will be asked to leave class.