

CHAMINADE UNIVERSITY PHY-252: UNIVERSITY PHYSICS II COURSE SYLLABUS – SPRING 2020

Instructor: Matthew Cochran
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Office Hours: After class (specific times will be announced) or by appointment
Prerequisites: MA-211 and PHY-251. Concurrent enrollment in PHY-252L.
Required Text: R. Knight, *Physics for Scientists and Engineers*, 4th ed., Pearson, New York, 2017. ISBN-13: 978-0-13-394265-1
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	25%	} lowest of these four dropped	
Exam 2	25%		
Exam 3	25%		
Homework and Quizzes	25%		
Final	25%		
90% – 100%			A
80% – 90%			B
70% – 80%			C
60% – 70%			D
0% – 60%			F

Incomplete grades (I) will be given in accordance with college regulations as outlined in the college catalog. Withdrawals (W) from the class are the responsibility of the student and deadlines are set by the college.

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.

STUDENT LEARNING OUTCOMES:

Upon successful completion of the course, the student will be able to:

- Solve given problems involving electricity and magnetism using algebra and trigonometry.
- Solve given problems involving light and optics using algebra and trigonometry.
- Solve given problems involving quantum physics using algebra and trigonometry.

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 educate 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.

The study of science and technology can be formative, exploring human creativity and potential in the development of technologies and scientific solutions, the opportunity to engage in the stewardship of the natural world, and the opportunity to promote social justice. We provide opportunities to engage with the problems that face Hawai'i and the Pacific region through the Natural Sciences curriculum, in particular, those centered around severe challenges in health, poverty, environmental resilience, and erosion of traditional culture. The Marianist Educational Values relate to Native Hawaiian ideas of *mana, na'auao, ohana, aloha* and *aina*. We intend for our Natural Sciences programs to be culturally-sustaining, rooted in our Hawaiian place, and centered on core values of *Maiau*, be neat, prepared, careful in all we do; *Makawalu*, demonstrate foresight and planning; *'Ai*, sustain mind and body; *Pa`a Na`au*, learn deeply.

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.

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 Counseling Center at (808) 735-4845 for further information (counselingcenter@chaminade.edu).

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.

WEEKLY SCHEDULE:

Week	Date	L#	Lecture Topic	4 th ed
1	Jan 13	1	Intro; Simple harmonic motion	15.1
	Jan 15	2	Phase constant	15.2
	Jan 16	3	Energy in SHM; Dynamics; Pendulum	15.3 & 15.4
	Jan 17	4	Into to waves	16.1 & 16.2
2	Jan 20	H1	Martin Luther King Jr Day	
	Jan 22	5	Sinusoidal waves	16.3
	Jan 23	6	Sound and light	16.5
	Jan 24	7	Power; Intensity; Decibels	16.8
3	Jan 27	8	Superposition	17.1
	Jan 29	9	Standing waves; Waves on a string	17.2 & 17.3
	Jan 30	10	Waves in a pipe	17.4
	Jan 31	11	Interference in 1D	17.5
4	Feb 03	12	Interference in 1D	17.5
	Feb 05	13	Charge	22.1 to 22.3
	Feb 06	14	Coulomb's Law	22.4
	Feb 07	E1	EXAM 1	
5	Feb 10	15	Coulomb's Law in 2D	22.4
	Feb 12	16	The electric field	22.5
	Feb 13	17	Continuous charge distributions	23.1 to 23.5
	Feb 14	18	Electric field and force	23.6
6	Feb 17	H2	Presidents' Day	
	Feb 19	19	Electric potential energy	25.1 & 25.2
	Feb 20	20	Electric potential; Potential in a capacitor	25.4 & 25.5
	Feb 21	21	Electric potential of point charges	25.6 & 25.7
7	Feb 24	22	Connecting potential and field	26.1 to 26.3
	Feb 26	23	Batteries and capacitance	26.4 & 26.5
	Feb 27	24	Dielectrics	26.7
	Feb 28	25	Current and resistance	27.1
8	Mar 02	26	Circuits; Kirchhoff's Rules	28.1 & 28.2
	Mar 04	27	Series and parallel resistors	28.4 & 28.6
	Mar 05	28	Review	
	Mar 06	E2	EXAM 2	
9	Mar 09	29	Resistor circuits; Ground	28.7 & 28.8
	Mar 11	30	RC Circuits	28.9
	Mar 12	31	Power	28.3
	Mar 13	32	Magnetism	29.1
10	Mar 16	33	Fields from current	29.2
	Mar 18	34	Magnetic force on a moving charge	29.7
	Mar 19	35	Field from a solenoid	29.6
	Mar 20	36	Magnetic force on wires	29.8
-			Spring Break	

WEEKLY SCHEDULE:

Week	Date	L#	Lecture Topic	4th ed
11	Mar 30	37	Magnetic flux; Lenz's Law	30.3 & 30.4
	Apr 01	38	Faraday's Law	30.5
	Apr 02	39	Electromagnetic waves	31.6 & 31.7
	Apr 03	40	Interference in 2D	17.7
12	Apr 06	41	Interference in 2D	17.7
	Apr 08	E3 EXAM 3		17.7
	Apr 09	42	Interference of light	33.1 & 33.2
	Apr 10	H3 Good Friday		
13	Apr 13	43	The diffraction grating	33.3
	Apr 15	44	Single slit diffraction	33.4
	Apr 16	45	Reflection and refraction	34.1 to 34.4
	Apr 17	46	Ray tracing; Lenses	34.5 to 34.6
14	Apr 20	47	Mirrors	34.7
	Apr 22	48	Vision	35.3
	Apr 23	49	Photoelectric effect	38.1 & 38.2
	Apr 24	50	Photons	38.3
15	Apr 27	51	Energy quantization	38.4 & 38.5
	Apr 29	52	Bohr atom	38.6
	Apr 30	53	Hydrogen spectrum	38.7
	May 01	54	Review	
Mon	May 06	FE	11:00 to 1:00 – FINAL EXAM (9:30 section)	
Thurs	May 09	FE	11:00 to 1:00 – FINAL EXAM (10:30 section)	