CHAMINADE UNIVERSITY
PHY-252: UNIVERSITY PHYSICS II
COURSE SYLLABUS – SPRING 2021

Instructor: Matthew Cochran
Email Address: matthew.cochran@chaminade.edu
Office: Henry Hall Office 123A
Office Phone: 739-8361
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	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

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 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.

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	4th ed
1	Feb 01	1	Intro; Simple harmonic motion	15.1
	Feb 03	2	Phase constant	15.2
	Feb 04	3	Energy in SHM; Dynamics; Pendulum	15.3 & 15.4
	Feb 05	4	Intro to waves	16.1 & 16.2
2	Feb 08	5	Sinusoidal waves	16.3
	Feb 10	6	Sound and light	16.5
	Feb 11	7	Power; Intensity; Decibels	16.8
	Feb 12	8	Superposition	17.1
3	Feb 15	**H1**	**Presidents' Day**	
	Feb 17	9	Standing waves; Waves on a string	17.2 & 17.3
	Feb 18	10	Waves in a pipe	17.4
	Feb 19	11	Interference in 1D	17.5
4	Feb 22	12	Interference in 1D	17.5
	Feb 24	13	Charge	22.1 to 22.3
	Feb 25	14	Coulomb's Law	22.4
	Feb 26	**E1**	**EXAM 1**	
5	Mar 01	15	Coulomb's Law in 2D	22.4
	Mar 03	16	The electric field	22.5
	Mar 04	17	Continuous charge distributions	23.1 to 23.5
	Mar 05	18	Electric field and force	23.6
6	Mar 08	19	Electric potential energy	25.1 & 25.2
	Mar 10	20	Electric potential; Potential in a capacitor	25.4 & 25.5
	Mar 11	21	Electric potential of point charges	25.6 & 25.7
	Mar 12	22	Connecting potential and field	26.1 to 26.3
7	Mar 15	23	Batteries and capacitance	26.4 & 26.5
	Mar 17	24	Dielectrics	26.7
	Mar 18	25	Current and resistance	27.1
	Mar 19	26	Circuits; Kirchhoff's Rules	28.1 & 28.2
8	Mar 22	27	Series and parallel resistors	28.4 & 28.6
	Mar 24	28	Review	
	Mar 25	**E2**	**EXAM 2**	
	Mar 26	**H2**	**Prince Kuhio Day holiday**	
9	Mar 29	29	Resistor circuits; Ground	28.7 & 28.8
	Mar 31	30	RC Circuits	28.9
	Apr 01	31	Power	28.3
	Apr 02	**H3**	**Good Friday**	
10	Apr 05	32	Magnetism	29.1
	Apr 07	33	Fields from current	29.2
	Apr 08	34	Magnetic force on a moving charge	29.7
	Apr 09	35	Field from a solenoid	29.6

WEEKLY SCHEDULE:

Week	Date	L#	Lecture Topic	4th ed
11	Apr 12	36	Magnetic force on wires	29.8
	Apr 14	37	Magnetic flux; Lenz's Law	30.3 & 30.4
	Apr 15	38	Faraday's Law	30.5
	Apr 16	39	Electromagnetic waves	31.6 & 31.7
12	Apr 19	40	Interference in 2D	17.7
	Apr 21	41	Interference in 2D	17.7
	Apr 22	**E3**	**EXAM 3**	
	Apr 23	42	Interference of light	33.1 & 33.2
13	Apr 26	43	The diffraction grating	33.3
	Apr 28	44	Single slit diffraction	33.4
	Apr 29	45	Reflection and refraction	34.1 to 34.4
	Apr 30	46	Ray tracing; Lenses	34.5 to 34.6
14	May 03	47	Mirrors	34.7
	May 05	48	Vision	35.3
	May 06	49	Photoelectric effect	38.1 & 38.2
	May 07	50	Photons	38.3
15	May 10	51	Energy quantization	38.4 & 38.5
	May 12	52	Bohr atom	38.6
	May 13	53	Hydrogen spectrum	38.7
	May 14	54	Review	
		FE	**FINAL EXAM**	