PHY-251-01-1: UNIVERSITY PHYSICS I
COURSE SYLLABUS – FALL 2019

Instructor:	Matthew Cochran
Email Address:	matthew.cochran@chaminade.edu
Office:	Henry Hall Office 123A
Office Phone:	739-8361
Course Time:	Monday, Wednesday, and Friday from 8:15 to 9:20
Course Room:	Henry Hall 223
Prerequisites:	MA-210. Concurrent enrollment in PHY-251L is assumed.
Required Text:	R. Knight, *Physics for Scientists and Engineers* 4th ed., Pearson, New York, 2017. ISBN-10: 0321844351, ISBN-13: 978-0321844354 (The 3rd ed is fine too.)
Other Materials:	Scientific calculator

COURSE DESCRIPTION:
This course is the first part of a year-long 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 mechanics, fluid dynamics, and thermodynamics.

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 homework assignments.

Make-up exams will only be given under extenuating circumstances beyond the student's control. Persons missing an exam due to illness or injury must present a doctor's certificate. Make-up exams must be completed within one week of the scheduled exam date or on the day the student returns to school (whichever comes first). Scheduling is the responsibility of the student.

HOMEWORK AND QUIZZES:
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 or your classmates. Do not fall behind. Homework is due at the beginning of class. Late homework is not accepted.

A ten-minute quiz will be given most weeks. Material for the quizzes will be drawn from material covered during the previous week. Quizzes may be given at the beginning of class, so arrive on time. Make-up quizzes are not given.

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.

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

1. The ability to apply quantitative reasoning and appropriate mathematics to describe or explain phenomena in the natural world;
2. The ability to interpret multiple scientific representations (e.g., verbal descriptions, diagrams, graphs, and formulas) and translate between them;
3. An understanding of mechanics (e.g., translational motion, forces and equilibrium, work, energy, and momentum);
4. An understanding of the principles of thermodynamics and fluids;
5. The ability to apply physics principles to understand humans, living systems, and scientific instrumentation.

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#	Topic	Reading 4 ed
	Aug 26	1	Course intro; Motion diagrams	
1	Aug 28	2	Position; Velocity	1.1 to 1.4
	Aug 30	3	Acceleration; Units	1.5 to 1.8
	Sep 02	**H1**	**Labor Day – No Class**	
2	Sep 04	4	Velocity in 1D; Acceleration in 1D	2.1 to 2.4
	Sep 06	5	Free fall	2.5
	Sep 09	6	Inclined plane; Two-step problems	2.6
3	Sep 11	7	Vectors; Trig review	3.1 to 3.4
	Sep 13	8	Motion in 2D; Projectile motion	4.1 to 4.2
	Sep 16	9	Angular velocity; Circular motion	4.5 & 4.6
4	Sep 18	10	Forces and Newton's laws	5.1 to 5.6
	Sep 20	**E1**	**EXAM 1 – Ch1 to Ch 4**	
	Sep 23	11	Free body diagrams	5.7
5	Sep 25	12	Statics	6.1
	Sep 27	13	Mass and weight	6.2 & 6.3
	Sep 30	14	Friction and drag	6.4 & 6.5
6	Oct 02	15	Second law examples	6.6
	Oct 04	16	Newton's third law	7.1 to 7.3
	Oct 07	17	Ropes and Pulleys	7.4
7	Oct 09	18	Dynamics in 2D	8.1 & 8.2
	Oct 11	19	Energy; Work	9.1 to 9.3
	Oct 14	**H2**	**Discoverers' Day – No Class**	
8	Oct 16	20	Work done by a spring	9.4
	Oct 18	**E2**	**EXAM 2 – Ch 5 to Ch 8**	

WEEKLY SCHEDULE:

Week	Date	L#	Topic	Reading 4 ed
	Oct 21	21	Thermal energy; Power	9.5 & 9.6
9	Oct 23	22	Potential energy	10.1 to 10.3
	Oct 25	23	Conservation of energy	10.4 & 10.5
	Oct 28	24	Impulse and momentum	11.1
10	Oct 30	25	Conservation of momentum	11.2 to 11.4
	Nov 01	26	Explosions; Momentum in 2D	11.5 & 11.6
	Nov 04	27	Torque	12.5
11	Nov 06	28	Torque and statics; Angular momentum	12.8 & 12.11
	Nov 08	29	Fluids; Pressure; Measuring pressure	14.1 to 14.3
	Nov 11	**H3**	**Veterans Day – No Class**	
12	Nov 13	30	Buoyancy	14.4
	Nov 15	**E3**	**EXAM 3 – Ch 9 to 12**	
	Nov 18	31	Fluid dynamics	14.5
13	Nov 20	32	Moles; Temperature; Ideal gasses	18.1 to 18.4
	Nov 22	33	Ideal gas processes	18.5
	Nov 25	34	Work and gasses	19.1 & 19.2
14	Nov 27	35	Heat and the First Law of Thermodynamics	19.3 & 19.4
	Nov 29	**H4**	**Thanksgiving Recess – No Class**	
	Dec 02	36	Thermal properties of matter; Calorimetry	19.5 & 19.6
15	Dec 04	37	Specific heat of gasses	19.7
	Dec 06	38	Heat transfer mechanisms	19.8
Finals	Dec 12	**FE**	**CUMULATIVE FINAL – 8:30 to 10:30**	