



School of Natural Sciences and Mathematics

Physics

UNIVERSITY PHYSICS I

Credits: 4 | Section: PHY-251, 01 or 02 | Term: Fall 2026

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Instructor Information

Instructor	Matthew Cochran
Email	matthew.cochran@chaminade.edu
Phone	(808) 739-7403
Office Location	Henry 123A
Office Hours	MWF from 11:30 to 12:20 or upon request.
Virtual Office	Zoom or Teams
Virtual Office Hours	TBA

Communication

I respond to emails within 24 hours. I'm typically on campus from early morning to midday or later, so feel free to catch me in person during this time.

School & Department

School	School of Natural Sciences and Mathematics
Location	Wesselkamper 115
Phone	(808) 440-4204
Questions?	Contact your instructor or the School of Natural Sciences and Mathematics

Course Description & Materials

Catalog Description

PHY-251 University Physics I (4)

A broad calculus-based introduction to mechanics and fluids. Prerequisites: MA-210. Concurrent registration in PHY-251L is required. Offered in the fall semester.

Course Snapshot

Modality	Face-to-Face
Meeting Location	Henry 203 and Eiben 102
Meeting Days / Times	8:30 Section (MWF 8:30 to 9:20, Th 1:00 to 1:50) 9:30 Section (MWF 9:30 to 10:20, Th 5:30 to 6:20)
Time Allocation	This is a four-credit hour course requiring 180 clock hours of student engagement, per the official CUH Credit Hour Policy. Weekly: 3.5 hours seat $\times$ 15 weeks = 52.5 hours 1.5 hours reading $\times$ 15 weeks = 22.5 hours 5.0 hours homework $\times$ 15 weeks = 75.0 hours Midterms: 7.0 hours study $\times$ 3 midterms = 21.0 hours Final: 2.0 hours seat + 7 hours study = 9.0 hours
Required Materials	Randall D. Knight, <i>Physics for Scientists and Engineers: A Strategic Approach with Modern Physics</i> , 5th edition. Can rent eText. Do not buy eHomework (Mastering Physics).
Recommended Items	Scientific calculator. (Phones will not be allowed during exams.)
Canvas	Course materials, announcements, and grades are posted to Canvas (chaminade.instructure.com). Homework assignments will be submitted via Canvas. Worksheets, homework solutions, and old exams will be posted on Canvas.

Learning Outcomes

Program Learning Outcomes (PLOs)

Upon completion of a minor in physics, the student 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.

Course Learning Outcomes (CLOs)

Upon completion of University Physics I, the student will be able to:

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

Marianist Values

An education in the Marianist Tradition is marked by five principles:

1. Education for formation in faith.
2. Provide an integral, quality education.
3. Educate in family spirit.
4. Educate for service, justice and peace, and integrity of creation.
5. Educate for adaptation and change.

In physics, we value all five principles. We provide a quality education that will help students adapt to a world that is sure to change.

Native Hawaiian Values

Education is central to both Marianist and Native Hawaiian culture — both seek transformative, value-centered learning that serves the marginalized. This is reflected in the 'Ōlelo No'eau (Hawaiian proverbs) below:

1. Educate for Formation in Faith (Mana): E ola au i ke akua ('Ōlelo No'eau 364) — May I live by God.
2. Provide an Integral, Quality Education (Na'auao): Lawe i ka ma'alea a kū'ono'ono ('Ōlelo No'eau 1957) — Acquire skill and make it deep.
3. Educate in Family Spirit ('Ohana): 'Ike aku, 'ike mai, kōkua aku kōkua mai ('Ōlelo No'eau 1200) — Recognize others, be recognized, help others, be helped.
4. Educate for Service, Justice and Peace (Aloha): Ka lama kū o ka no'eau ('Ōlelo No'eau 1430) — Education is the standing torch of wisdom.
5. Educate for Adaptation and Change (Aina): 'A'ohe pau ka 'ike i ka hālau ho'okahi ('Ōlelo No'eau 203) — All knowledge is not taught in the same school.

Alignment of Course Learning Outcomes

	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
Marianist Values	X	X	X	X	X
Program Learning Outcomes	X	X	X	X	X
Native Hawaiian Values	X	X	X	X	X
General Education	X	X	X	X	X

Attendance & In-Class Participation

Attendance Policy

Regular attendance is expected of all students.

Excused Absence	Illness with documentation, family emergency, University activity
Unexcused Absence	Any absence not pre-approved or documented
Course Failure	More than six unexcused absences — student may receive a failing grade

In-Class Expectations

Active, respectful engagement is essential. Students are expected to come prepared and contribute meaningfully to discussions, activities, and collaborative work.

Students are expected to:

- Come prepared — complete readings and activities before each session.
- Participate actively in discussions and group work, demonstrating critical thinking.
- Engage respectfully and honor diverse perspectives.
- Use personal devices for course purposes only unless otherwise directed.
- Submit work by established deadlines to support course pacing.

Course Activities

In-Class Activities	You will work with partners in class. It is important that partners engage in discussion of their work and avoid working as isolated individuals.
Homework / Assignments	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.
Quizzes / 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.
Projects	There will be no projects in lecture.

Course Policies

Late Work	Late homework is accepted but will be penalized by 20%. It will be penalized by an additional 20% for each additional week.
Make-Up Work	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 note. 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.
Extra Credit	Students may be allowed to submit exam corrections for extra points.
Incomplete Grade	Incomplete grades will be given in accordance with college regulations as outlined in the college catalog.
Syllabus Changes	The instructor reserves the right to modify the syllabus. Changes will be announced in class and posted to Canvas.

Final Grades

Grade	Range
A	90% and above
B	80 – 89%
C	70 – 79%
D	60 – 69%
F	59% and below

University Policies & Statements

Academic Honesty Statement

Academic honesty is an essential aspect of all learning, scholarship, and research. It is one of the values regarded most highly by academic communities throughout the world. Violations of the principle of academic honesty are extremely serious and will not be tolerated.

Students are responsible for promoting academic honesty at Chaminade by not participating in any act of dishonesty and by reporting any incidence of academic dishonesty to an instructor or to a University official. Academic dishonesty may include theft of records or examinations, alteration of grades, plagiarism, **and unauthorized and/or undisclosed AI usage**, in addition to more obvious dishonesty. See catalog section *Student Use of Artificial Intelligence in Academic Work* for further information.

Questions of academic dishonesty in a particular class are first reviewed by the instructor, who must make a report with recommendations to the Director of Academic College. Punishment for academic dishonesty will be determined by the instructor, Director, and the Dean of Academic College and may include an “F” grade for the work in question, an “F” grade for the course, academic notice, or dismissal from the University.

Artificial Intelligence (AI) Statement

Chaminade University recognizes the increasing role of artificial intelligence (AI) technologies in academic and professional environments. AI encompasses, but is not limited to, generative AI platforms, automated writing or content generation software, coding assistants, and similar tools. Students must ensure all submitted work genuinely reflects their knowledge and effort. Using AI to produce or significantly complete graded assignments, exams or other academic tasks – defined as use that substitutes for or substantially replaces a student's own analysis, reasoning or written expression – without explicit instructor approval is considered academic misconduct and will be dealt with according to the University's Academic Honesty Policy.

If an instructor has reasonable grounds to question whether submitted work genuinely reflects a student's own knowledge, authorship, or mastery of course material — or whether it meets the course's expectations for AI use — the instructor may require the student to provide additional or alternative evidence of authorship and content mastery. Such evidence may include drafts, notes, revision history, source materials, process explanations, oral discussion, in-class work, or completion of an alternative assessment. A student's refusal or inability to provide such evidence may be considered, along with other available information, in evaluating whether the work meets course requirements and stated learning outcomes. Instructors will not rely solely on AI detection software or other automated tools in making grading or academic integrity determinations. Such determinations will be based on the totality of the available information and handled in accordance with applicable University policies and procedures. See the catalog section Student Use of Artificial Intelligence in Academic Work for further information.

Nondiscrimination and Title IX

Chaminade University is committed to providing a learning, working, and living environment that promotes the dignity of all people, inclusivity, and mutual respect and is free of all forms of sex discrimination and gender-based violence, including sexual assault, sexual harassment, gender-based harassment, domestic violence, dating violence, and stalking. As a member of the University faculty, I am required to immediately report any incident of sex discrimination or gender-based violence to the campus Title IX Coordinator. For pregnant and parenting students, I am also obligated to provide you with similar resources for support and protections available to you. My goal is to make sure that you are aware of the range of options available to you and have access to the resources and support you need.

Contact information and reporting options: chaminade.edu/titleix/nondiscrimination/. File a report via the [Campus Incident Report Form](#).

Nondiscrimination Policy

Chaminade University is committed to complying with all State and Federal statutes, rules, and regulations which prohibit discrimination. The University is committed to a policy of nondiscrimination on the basis of race, sex, gender identity and expression, age, religion, color, national origin (including shared ancestry and ethnic characteristics), ancestry, citizenship, disability, genetic information, marital status, breastfeeding, arrest and court record (except as permissible under State law), sexual orientation, or status as a covered veteran. Inquiries about Title IX or general Civil Rights concerns may be referred to the University's Title IX Coordinator, the U.S. Department of Education's Office for Civil Rights, or both and contact information may be found [HERE](#). *On-campus Confidential Resources may also be found here at [CAMPUS CONFIDENTIAL RESOURCES](#)*. The University's Nondiscrimination Policy and Grievance Procedures can be located on the University webpage at: <https://chaminade.edu/compliance/title-ix-nondiscrimination-policies-procedures/>.

To report information about conduct that may constitute sex discrimination or make a complaint of sex discrimination under Title IX, please refer to the [Campus Incident Report form](#). Chaminade University prohibits sex discrimination in any education program or activity that it operates. The NOTICE of NONDISCRIMINATION can be found here: [Notice of Nondiscrimination](#).

Disabilities Statement

Accessibility Services recognizes disability as a valued aspect of diversity and ensures equal access to the educational environment in accordance with Section 504 of the Rehabilitation Act; the Americans with Disabilities Act, as amended; and the principles and professional standards of the Association on Higher Education and Disability.

Access is supported through reasonable accommodations and referrals to campus and community resources. Appointments with the Accessibility Services Coordinator are available through Stellic at <https://chaminade.stellic.com> and may be held virtually or in person. Drop-in appointments are also welcome.

Students seeking support must meet with the Accessibility Services Coordinator as early as possible, even if they are unsure whether they have appropriate documentation of their disability or its impacts. The Accessibility Services Coordinator prioritizes listening to student experiences and will discuss any documentation needs during the initial intake meeting. Students may seek support at any time. Learn more at <https://chaminade.edu/ada-accommodations>.

Assessment of Student Work

Chaminade University may use student work anonymously to assess achievement of course, program, and institutional learning outcomes as part of ongoing quality improvement efforts.

Campus Resources & Support Services

The following resources are available to all Chaminade students. Reach out early — these services exist to support your success.

Resource	Description	Contact / Website
Accessibility Services (Kōkua 'Ike)	Accommodations under Section 504 and ADA. Contact early — appointments via Stellic, virtual or in person.	ada@chaminade.edu chaminade.edu/ada-accommodations
Tutoring & Academic Coaching (Kōkua 'Ike)	Tutoring and Academic Coaching Services support students' progression toward their academic, personal, and professional goals with clarity and intention. Services include individualized support in english, math, nursing, sciences, and social sciences, as well as guidance in developing goals and study strategies.	chaminade.edu/tutoring-academic-coaching-services
Career Services	Career Services support students throughout their career journeys. Services include individualized job search strategy coaching, resume reviews, job interview coaching, and access to career-related resources and opportunities.	chaminade.edu/career-services
Basic Needs Resources	Support for food insecurity, housing instability, and other basic needs.	chaminade.edu/basic-needs/
Title IX / Nondiscrimination	Reporting and support for sex discrimination and gender-based violence. Campus Incident Report Form available online.	chaminade.edu/titleix/resources-and-support/
Hazing Prevention	Confidential support, crisis intervention, and reporting for any type of abuse including hazing.	hazingpreventionnetwork.org/athlete-helpline/
Campus Safety / SafeSwords	Security escort service for anyone who feels unsafe walking alone on campus at any time of day. Call security and a professional will escort you to your destination.	chaminade.edu/student-life/security/campus-safeswords-program/
CUH Alert Emergency Notification	Emergency text system. Register your cell number via the Chaminade portal and confirm the text to complete enrollment.	chaminade.edu

Weekly Course Schedule

The instructor reserves the right to modify this schedule. Changes will be announced in class and posted to Canvas.

Week	Date	L#	Topic	Reading
1	Aug 17	1	Course intro	
	Aug 19	2	Motion diagrams	1.1 to 1.4
	Aug 20	3	Position; Velocity	1.1 to 1.4
	Aug 21	4	Acceleration; Units	1.5 to 1.8
2	Aug 24	5	Velocity in 1D	2.1 to 2.3
	Aug 26	6	Acceleration in 1D	2.4
	Aug 27	7	Free fall; Inclined plane	2.5 & 2.6
	Aug 28	8	Vectors; Trig review	3.1 to 3.4
3	Aug 31	9	More Vectors; Trig review	3.1 to 3.4
	Sep 02	10	Motion in two dimensions	4.1
	Sep 03	11	Projectile motion	4.2
	Sep 04	12	Circular motion	4.4 & 4.5
4	Sep 07	H1	Labor Day – No Class	
	Sep 09	13	Forces and Newton's Laws	5.1 to 5.6
	Sep 10	14	Review	
	Sep 11	E1	Exam 1	
5	Sep 14	15	Free body diagrams	5.7
	Sep 16	16	Statics	6.1
	Sep 17	17	Mass and weight	6.2 & 6.3
	Sep 18	18	Friction and drag	6.4 & 6.5
6	Sep 21	19	Second Law examples	6.6
	Sep 23	20	Newton's Third law	7.1 to 7.3
	Sep 24	21	Ropes and Pulleys	7.4
	Sep 25	22	Dynamics in two dimensions	8.1 & 8.2
7	Sep 28	23	Energy; Work	9.1 to 9.3
	Sep 30	24	Work done by a spring	9.4
	Oct 01	25	Thermal energy; Power	9.5 & 9.6
	Oct 02	26	Potential energy	10.1 to 10.3
8	Oct 05	27	Conservation of energy	10.4 & 10.5
	Oct 07	28	More Conservation of energy	10.4 & 10.5
	Oct 08	29	Review	
	Oct 09	E2	Exam 2	
-			Wellness Week	
9	Oct 19	30	Impulse and momentum	11.1
	Oct 21	31	Conservation of momentum	11.2 to 11.4
	Oct 22	32	Explosions; Momentum in 2D	11.5
	Oct 23	33	Torque	12.5
10	Oct 26	34	Torque and statics	12.8
	Oct 28	35	Fluids; Pressure	14.1 & 14.2
	Oct 29	36	Measuring pressure	14.3
	Oct 30	37	Buoyancy	14.4
11	Nov 02	38	Dynamics in two dimensions	14.5
	Nov 04	39	Moles	18.1 to 18.3

Week	Date	L#	Topic	Reading
	Nov 05	40	Temperature	18.1 to 18.3
	Nov 06	41	Ideal gases	18.6
12	Nov 09	42	Ideal gas processes	18.7
	Nov 11	H3	Veteran's Day – No Class	
	Nov 12	43	Review	
	Nov 13	E3	Exam 3	
13	Nov 16	44	Energy and gases	19.1 & 19.2
	Nov 18	45	Heat and the First Law	19.3 & 19.4
	Nov 19	46	Thermal properties of matter	19.5
	Nov 20	47	Calorimetry	19.6
14	Nov 23	48	Specific heat of gases	19.7
	Nov 25	49	Molecular speed and collisions	20.1 & 20.2
	Nov 26	H4	Thanksgiving – No Class	
	Nov 27			
15	Nov 30	50	Pressure in a gas	20.3
	Dec 02	51	Temperature	20.4
	Dec 03	52	Thermal energy and specific heat	20.5
	Dec 04	53	Review	
Finals	Dec 09	FE	8:30 Section (Final Wed 8:30 – 10:30)	
	Dec 10	FE	9:30 Section (Final Thu 1:15 – 3:15)	