



Modern Physics  
PHYS 2054  
January 13<sup>th</sup> – May 3<sup>rd</sup>  
Tuesday, 8:00am – 9:25am  
Thursday, 8:00am – 9:25am  
Location, TBD

Final exam:  
TBD

Welcome to PHYS 2054 – Modern Physics!

### INSTRUCTOR INFORMATION

**Instructor:** Nathan J. Dawson

**Email:** [ndawson@hpu.edu](mailto:ndawson@hpu.edu)

**Office:** AC 311A

**Office Phone:** 236-7909

**Office hours:** MW 2:30pm – 4:30pm

### COURSE INFORMATION AND REQUIREMENTS

**Course meeting times:** Tues, Thurs, 8:00am – 9:25am

**Course meeting location:** TBD (Downtown Campus)

**Required Resources:** H. D. Young and R. A. Freedman, *University Physics with Modern Physics*, 14<sup>th</sup> edition  
Pearson's Mastering Physics online homework code.

### COURSE DESCRIPTION

**Course Objectives:** This course is 3 credits and intended as an introduction to physical phenomena discovered in the modern scientific era such as entropy, wave optics, relativity, quantum mechanics, and particle physics. The main focus of this course is to familiarize students with the reasoning behind basic physical concepts and their applications. The course shall increase students' ability to apply the basic ideas of algebra and calculus to physical models. The course also helps develop critical thinking skills and scientific reasoning methods through practice by the student.

**Prerequisite:** PHYS 2052.

**Method of Instruction:** This is a traditional lecture-style course.

### ASSESSMENT, GRADING SCHEME, and COURSE SCHEDULE

**Student work:** homework will be given in class and assigned a due date. The problems will cover the material presented in the book and/or lecture. Each problem will be graded on a 4.0 scale, where 4.0 = 100%, 3.0 = 85%, 2.0 = 75%, 1.0 = 65%, and a 0.0 = 0%. The homework will be averaged at the end of the course and assigned a linearly interpolated percentage score from the listed scale. In addition to the homework, each student will benefit from reading the book's material as well as answering the questions at the end of each chapter. Since the course material progresses quickly, it will help to read the material before it is presented in class. Working together on the homework is encouraged, but be sure you are able to solve these and similar problems on your own! In addition, questions will be discussed in groups during class.

**Examinations:** there will be two 80-minute-long, in-class examinations and one 120-minute-long final examination. The examinations will consist of general physics problems and conceptual questions. The exam cover will be used to give the student select formula to be referenced during the in-class examinations. It is best to be familiar enough with all of the formulae such that the information on the cover sheet is used only as a reference. All scratch paper may be turned in with the exam.

Homework	20%
In-class exams (23% each)	46%
Final exam	34%

A	92 – 100%
A–	90 – 91%
B+	87 – 89%
B	82 – 86%
B–	80 – 81%
C+	77 – 79%
C	72 – 76%
C–	70 – 71%
D	60 – 69%
F	0 – 59%

**Course Schedule:** (Examinations are tentatively scheduled)

Item	Description
Chapter 19	First Law of Thermodynamics
Chapter 20	Second Law of Thermodynamics
Chapter 35	Interference
Chapter 36	Diffraction
Chapter 37	Relativity
Chapter 38	Light behaving as particles
Examination 1	<b>02/13</b>
Chapter 39	Particles behaving as waves
Chapter 40	Quantum mechanics
Chapter 41	Atomic structure
Chapter 42	Molecules and condensed matter
Examination 2	<b>04/02</b>
Chapter 43	Nuclear physics
Chapter 44	Particle physics
Final Examination (cumulative)	<b>TBD</b>

## INSTRUCTOR POLICIES AND EXPECTATIONS

### Attendance and Participation:

- Each student is expected to attend all lectures.
- Each student is expected to read ahead in the book chapter.
- Each student is expected to be ready for the test prior to the exam.

**Instructor availability:** I will be available in my office after each laboratory. If this is not an option, students are encouraged to visit any of the four office hours and send emails to me using [ndawson@hpu.edu](mailto:ndawson@hpu.edu). If you do not receive a timely response, then please send a follow-up email.

**Absences and make-up exam policy:** all absences, periods of time when a student is unable to complete course work due to a reason such as illness, military duty, or family emergency, must be coordinated with the instructor. Students should make every effort to notify the instructor **PRIOR** to the absence. But if you cannot, please notify

the instructor as soon as possible. This record of absences will be important if an **incomplete** grade and course extension are necessary due to extended absences. If a student has an excused absence on the day of an in-class exam, then a different exam will be given of at least the same level of difficulty as the regularly scheduled exam.

**Homework policy:** All homework problems must be completed prior to the deadline.

**Withdrawal:** If you need to make any changes to your registration, including withdrawing from or adding courses, return to your HPU advisor for assistance.

For specific deadlines regarding dropping the course with a withdrawal “W” grade and with no GPA penalty, but possible loss of some or all of the tuition. Pay particular attention to the dates associated with withdrawing from the course. It could determine whether you get any tuition back in the event you need to drop the course.

**Incomplete:** Students who are unable to complete course requirements due to circumstances beyond their control (e.g. Military duty, illness, natural disaster ...) can make a written application to me with documentation for an incomplete “I” grade and complete the course requirements after the end of the course.

**Extra Credit:** **There is no extra credit in this course.**

**Academic Honesty:** All Students are expected to adhere to the University's policies regarding academic honesty. The policy of Hawai'i Pacific University is clear regarding academic dishonesty. Any student, who cheats on an academic exercise, lends assistance to others, or who hands in, as a completed assignment, work that is not his or her own will be penalized. The ultimate penalty is suspension from the University. The term "academic exercise" includes all forms of work submitted for points, grades, or credit. Please see the Student Handbook for the full policy at [www.hpu.edu/studenthandbook](http://www.hpu.edu/studenthandbook).

## UNIVERSITY POLICY AND SUPPORT

**HPU's Online Help:** HPU Client Services at (808) 566-2411 or email: [helpdesk@hpu.edu](mailto:helpdesk@hpu.edu) for technical assistance.

**Bookstore:** Books are available at the HPU Bookstore at the campus where this course is offered (Downtown or Hawaii Loa) and online (all campuses) at [www.hpu.bncollege.com](http://www.hpu.bncollege.com). Rentals and eBooks are available for many of the course materials. You can contact the HPU Bookstore at 808.544.0290 if you have any questions.

**Accessibility Services (ADA Accommodations):** Under the Rehabilitation Act of 1973 (Section 504), the Americans with Disabilities Act Amendments Act 2008 (ADAAA), and Title III (Public Accommodations) Hawaii Pacific University does not discriminate against individuals with disabilities. Any student who feels he/she may need an accommodation based on the impact of a disability is invited to contact Accessibility Services at HPU (808-544-1197); at [access@hpu.edu](mailto:access@hpu.edu), or at the LB Bldg., Suite 602, 1060 Bishop Street). This is a necessary step in order to ensure reasonable accommodations in a course. Students are not expected to disclose their specific disability to the professor; Accessibility Services will provide a letter for an instructor explaining the accommodations and NOT the nature of the disability. If you would like to discuss other concerns, such as medical emergencies or arrangements in the event of an emergency evacuation, please make an appointment to talk with the professor as soon as possible.

**Counseling & Behavioral Health Services (CBHS):** CBHS provides current HPU students with free and confidential psychological counseling. Sometimes the stress of school along with personal issues can be too much to handle. CBHS provides the opportunity for students to discuss any personal problems or concerns and explore solutions. Appointments can be scheduled by phone at 808-687-7076 or in person at the Downtown campus at UB 905. Office hours are Monday–Friday, 8:00 a.m. to 5:00 p.m.

**Military Veteran Center (MVC):** MVC has one full time mental health provider from the Veterans Administration who offers confidential psychological counseling to military veterans. Sometimes, the transition from military to civilian life, managing school, and other personal issues can be challenging. MVC has an onsite provider at the

downtown campus and appointments can be scheduled by phone at 808-763-7470. Office hours are Monday–Thursday, 8:00 a.m. to 5:00 p.m.

**Title IX - Sexual Discrimination and Sexual Misconduct Policy:** HPU is committed to providing an educational environment free from sexual discrimination. Students, faculty and staff must report violations of sexual harassment, sexual assaults, stalking, domestic violence, dating violence, and retaliation to trigger corrective and preventative actions as well as victim support services. Victim support services include assistance with filing police reports, referrals to counseling and medical providers, assignment of a victim advocate, and assistance with academic accommodations. Faculty and students who become aware of such violations should contact the Title IX Coordinator (808-687-7014) or file an anonymous report using the Compliance Hotline (877-270-5054 or [www.tnvinc.com/hpu](http://www.tnvinc.com/hpu)). More details can be found at [www.hpu.edu/studenthandbook](http://www.hpu.edu/studenthandbook).

**Security & Safety:** Help keep our campus safe and secure. For emergency situations, call 911; for non-emergencies, contact HPU security (808-544-1400). Timely reports of observations to security and the police can go a long way in preventing future crimes. Also, HPU security provides transportation or a walking escort at the Hawaii Loa campus, and a walking escort on the Downtown campus for anyone walking alone on foot to any university parking lot, facility or city bus stop. Call 808-236-3515 (Hawaii Loa) and 808-544-1400 (Downtown)—a security officer will be sent to your location. At military base locations, call Base Security at 808-474-2222. To receive critical information via text messaging, update your mobile number with Rave Alert (<http://phone.hpu.edu>), HPU's emergency text program. Go to <https://www.hpu.edu/security/index.html> for more about campus security and emergency preparedness.

**Tutoring:**

Email: [tutoring@hpu.edu](mailto:tutoring@hpu.edu)

Phone: (808) 544-9334