PHYSICS 651
ELECTRODYNAMICS II
SPRING 2025
Watanabe Hall 417A, MWF 11:30am-12:20pm
Monday, January 13 – Friday, May 16
Last Day of Instruction: Wednesday, May 7

Instructor
Dr. Chester Vause
Professor, Department of Physics & Astronomy
Watanabe Hall 434, 808-956-2989, cvause@hawaii.edu
Office Hours: After class or by appointment

Prerequisites (UHM Catalog)
For Physics 650: Physics 450, and Physics 600 (or concurrent), or Math 402
For Physics 651: Physics 650

Primary Textbooks (Physics 650-651)
"The Classical Theory of Fields" (4th revised English ed.), Course of Theoretical Physics, Volume 2, L. D. Landau and E. M. Lifshitz (Pergamon Press, Oxford, 1975)

"Electrodynamics of Continuous Media," Course of Theoretical Physics, Volume 8, L. D. Landau and E. M. Lifshitz (Pergamon Press, Oxford, 1984, 2nd ed. revised and enlarged English ed. by E. M. Lifshitz and L. P. Pitaevskii)

Student Learning Outcomes (Physics 650-651)
Among the student learning outcomes of this course are the abilities to:
(a) Understand the Principle of Relativity, and the use of tensor analysis methods to formulate geometric concepts in Einstein's formulation of Special Relativity
(b) Present the formalism of classical electrodynamics of charged point particles as a classical relativistic field theory.
(c) Formulate the fundamental principles of electrodynamics as a branch of classical mechanics in terms of the Principle of Least-Action, the Lagrangian, Hamiltonian, and covariant formulations.
(d) Study of static and time-dependent applications of electrodynamics of point particles, electromagnetic waves, radiation of charged particles.
(e) Provide the formulation of macroscopic electrodynamics using the principles of thermodynamics. Statics, dynamics, and phenomenological constituitive relations of macroscopic bodies (metals, insulators, superconductors).

Exams
Exam instructions will be given on the exam cover page, Exams are closed-book, two student-generated notes, paper pages only (not electronic), per new exam material (2 pages for Exam 1, 4 pages for Exam 2, 6 pages for Exam 3, 8 pages for Final Exam), and scientific calculator, only. No internet devices (smartphones, pads, etc.) or electronic storage media. No other sources of material are allowed. By taking the exams, you

consent to the conditions set forth.
The Exam dates are:

Exam 1	Friday	February 14,
Exam 2	Friday	March 14,
Exam 3	Wednesday	April 16,
Final Exam	Friday	May 16 (12:00pm- 2:00pm).

Each Exam is based on material covered since the previous Exam (including the Final Exam). Each Exam is worth 1/4 of the final grade total score:

$$\text{Total Score}(\%) = (1/4)*[\text{Exam1}(\%)+\text{Exam2}(\%)+\text{Exam3}(\%)+\text{FinalExam}(\%)]$$

Grade Scale
The Letter Grade for the course is determined from the Total Score(%) according to the following scale:

A- (86%-90%)	A (91%-95%)	A+ (96%-100%)
B- (61%-70%)	B (71%-80%)	B+ (81%-85%)
C- (31%-40%)	C (41%-50%)	C+ (51%-60%)
	F (0%-20%)	D (21%-30%)

NO INCOMPLETE GRADE GIVEN

NOTICE

The Instructor's course lectures and any of the Instructor's written materials (handouts, solutions, etc.) are the intellectual property of the Instructor, and are for your personal use only. It is not to be shared or distributed to anyone, in any form, in any media. No photography, no video, no audio, no electronic recordings of any kind.

Be prepared to take the exams on the assigned dates.*. This is not negotiable. If you have time conflicts, decide if this course is your first priority. I do not "work around" student's personal plans and schedules (work, travel and otherwise).
*(The Final Exam date is set by the University.)