UNIVERSITY OF CALGARY
FACULTY OF SCIENCE
DEPARTMENT OF PHYSICS AND ASTRONOMY COURSE OUTLINE

1. **Course:** PHYS 613, Electrodynamics Winter 2017

   Instructor: Dr. David Knudsen | SB638 | 403.220.8651 | knudsen@ucalgary.ca | Office Hours: by appointment

   Lecture Sections: LEC 1: MW 5:00 – 6:15 PM | SS 117

   Course Website: d2l.ucalgary.ca

   Departmental Office: SB 605, 403---220---5385, phasugrd@ucalgary.ca

2. **Prerequisites:** Background should include Physics 457 and Physics 501 or equivalent

3. **Grading:** The University policy on grading and related matters is described sections F.1 and F.2 of the online University Calendar. In determining the overall grade in the course the following weights will be used:

4.

Assignments	40%	
Midterm test	20%	
Final Examination	40%	(To be scheduled by the Registrar)

There will be one (in---class) mid---term examination in late February or early March. The final exam will consist of two parts: (a) a "take home" part and (b) a shorter exam to be scheduled by the Registrar during the final exam period.

Percentage grades will be given for all elements of term work and examinations. A weighted course percentage will be calculated for each student after the final exam is written.

Percentage to letter grade conversion scale:

> = 97 %	A +	> = 77 %	B +	> = 62 %	C +	> = 50%	D +
> = 87 %	A	> = 72 %	B	> = 57 %	C	> = 48 %	D
> = 82 %	A ---	> = 67 %	B ---	> = 52 %	C ---	< 48 %	F

5. **Missed Components of Term Work:** The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in Section 3.6. It is the student's responsibility to familiarize himself/herself with these regulations. See also Section E.6 of the University Calendar.

6. **Scheduled out-of-class activities:** None.

   REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT---OF---CLASS---TIME---ACTIVITY. If you have a clash with this out---of---class---time---activity, please inform your instructor as soon as possible so that alternative arrangements may be made for you.

7. **Course Text:** *Classica Electrodynamics* (3rd Edition), J.D. Jackson, J. Wiley and Sons. Auxiliary text: *Introduction to Electrodynamics*, 3rd Edition, D. J. Griffiths

8. **Examination Policy:** To be announced. Students should also read the Calendar, Section G, on Examinations.

9. **Approved Mandatory and Optional Course Supplemental Fees:** None.

10. **Writing across the curriculum statement:** In this course, the quality of the student's writing in laboratory reports will be a factor in the evaluation of those reports. See also Section E.2 of the University Calendar.

11. **Human studies statement:** This course is being evaluated for education research, you will be given separate paperwork indicating whether students in the course are willing to part of that study. See also Section E.5 of the University Calendar.

12. **OTHER IMPORTANT INFORMATION FOR STUDENTS:**

(a) **Academic Misconduct:** Academic misconduct (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under Section K. Student Misconduct to inform yourself of definitions, processes and penalties.

(b) **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on assembly points.

(c) **Student Accommodations:** Students needing an Accommodation because of a Disability or medical condition should contact Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities available at http://www.ucalgary.ca/policies/files/policies/procedure---for---accommodations---for---students---with---disabilities_0.pdf. Students needing an Accommodation in relation to their coursework or to fulfill requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, preferably in writing, to the Associate Head of the Department of Physics and Astronomy, Dr. David Feder, by email (dfeder@ucalgary.ca) or by phone (403.220.3638).

(d) **Safewalk:** Campus Security will escort individuals day or night (http://www.ucalgary.ca/security/safewalk/). Call 220---5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.

(e) **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). As one consequence, students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information see also http://www.ucalgary.ca/secretariat/privacy.

(f) **Student Union Information:** VP Academic Phone: 220---3911 Email: suvpaca@ucagary.ca.
SU Faculty Rep: Phone: 220---3913 Email: science1@su.ucalgary.ca, science2@su.ucalgary.ca and science3@su.ucalgary.ca
Student Ombuds Office: 403 220---6420 Email: ombuds@ucalgary.ca; http://ucalgary.ca/provost/students/ombuds

(g) **Internet and Electronic Device Information:** You can assume that in all classes that you attend, your cell phone should be turned off unless instructed otherwise. Also, communication with other individuals, via laptop computers, Blackberries or other devices connectable to the Internet is not allowed in class time unless specifically permitted by

the instructor. If you violate this policy you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.

(h) **U.S.R.I.:** At the University of Calgary, feedback provided by students through the Universal Student Ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses (www.ucalgary.ca/usri). Your responses make a difference --- please participate in USRI Surveys.

13. **OTHER COURSE RELATED INFORMATION:**

(a) **Course Description :**

Interaction between charged particles and the electromagnetic field including relativistic formulation. Scattering and energy losses of charged particles. Radiation by charged particles.

(b) **Course Learning Outcomes**

(c) **Course Learning Incomes**

(d) **Syllabus**

Week beginning	Sections	Topic
January 9	6.1, 1.1---1.5, 1.7, 1.13	Maxwell's equations, Electrostatics
January 16	4.1,3,5,7	Electrostatics of macroscopic media
January 23	5.1---5.4, 5.6---5.8, 5.15---5.17	Magnetostatics, Magnetic induction
January 30	6.2---6.8	Fields from moving charges, Poynting theorem
February 6	7.1---7.8	EM waves and wave propagation
February 13		EM waves and wave propagation, cont'd
February 20	None	Reading Week
February 27	8.1---8.8	Waveguides
March 6	9.1---9.4	Radiating systems
March 13	10.1---10.4	Scattering
March 20	Chapter 11	Relativity
March 27	12.1---12.5	Dynamics of relativistic particles
April 3	13.1---13.4	Scattering
April 10	14.1---14.6, 15.1---15.2	Radiation by moving charges, Bremsstrahlung