

Policy about course outlines can be found in Section 23.4 (2) of the University Calendar

University of Alberta

PHYS 574 Experimental Methods in Physics Section B01 Winter Term 2012 (first third)

Instructor: Prof. Doug Gingrich
Office: CCIS 2-097
Phone: 492-9501
E-mail: gingrich@ualberta.ca
Web Page: <http://www.cpp.ualberta.ca/~gingrich/phys574/phys574.html>

Lecture Room & Time: CCIS L1-029, 9:30-10:50 Tuesdays and Thursdays

Office Hours: By appointment; or take a chance and drop-in if my door is open (do not knock if closed)

Course Description: Methods of particle detection. This third of the course deals with the topics of passage of particles through matter and sampling calorimeters.

Course Objectives: Consolidate the fundamental concepts of the interactions of particles with matter; main emphasis on the electromagnetic interactions, but some knowledge of the nuclear and weak interactions. Understand generic sampling calorimeter concepts. Based on the background of this course, the student should be able to easily understand the features of specific past, present, and future calorimeters. The ability of the student to participate in the design of a calorimeter should be enhanced after having completed this course.

Key to Success: Attend classes; do problem set.

Lecture Schedule & Assigned Readings: Reading anything you can get your hands on about particle detectors is a good idea.

Week	Dates	Topic
1	10 Jan	Energy Loss of Heavy Charged Particles
1	12 Jan	Energy Loss of Electrons and Positrons
2	17 Jan	Energy Loss of Photons
2	19 Jan	Electron and Photon Showers
3	24 Jan	Hadronic Showers
3	26 Jan	Electromagnetic Shower Detectors
4	31 Jan	Hadronic Shower Detectors
4	2 Feb	System Aspects of Calorimeters

Required Textbook: There is no required textbook for this course.

Useful References:

The Review of Particle Physics, PDG
Introduction to experimental particle physics, R.C. Fernow
Particle Detectors, K. Kleinknecht
Radiation Detection and Measurement, G.E. Knoll
Techniques for Nuclear and Particle Physics Experiments, W.R. Leo

Recommended or Optional Learning Resources: See course website.

Grade Evaluation: A distribution system will be used; the grades will be scaled following the University recommended distribution of grades.

<u>EXAMS</u>	<u>WEIGHTING</u>	<u>DATE</u>
Problem Set	100%	2 February 2012

Assigned Problems Sets: A total of 18 problems will be assigned at the beginning of the first class. The problem set is due at 4:30 p.m. on the last day of class for this third of the course. Late submissions will not be accepted. Please hand them to me in my office.

Late and Missed Assignments: Late assignments will not be accepted and will be given a grade of zero. A student who cannot complete the term assignment because of an incapacitating illness, severe domestic affliction or other compelling reasons can apply for extension of time to complete an assignment. Deferred term work is a privilege and not a right; there is no guarantee that a deferral will be granted. Misrepresentation of facts to gain a deferral is a serious breach of the *Code of Student Behaviour*.

Student Responsibilities:

ACADEMIC INTEGRITY: ‘The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the *Code of Student Behaviour* (online at www.ualberta.ca/secretariat/appeals.htm) and avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.’

All forms of dishonesty are unacceptable at the University. Cheating, plagiarism and misrepresentation of facts are serious offenses. Anyone who engages in these practices will receive at minimum a grade of zero for the exam or paper in question and no opportunity will be given to replace the grade or redistribute the weights. Any offense will be reported to the Senior Associate Dean of Science who will determine the disciplinary action to be taken. Typical sanctions for serious violations of the Code have included disciplinary grade reductions, disciplinary failing grades, suspension or permanent expulsion from the University of Alberta.

CELL PHONES: Cell phones are to be turned off during lectures.

STUDENTS WITH DISABILITIES: Students who require accommodation in this course due to a disability are advised to discuss their needs with Specialized Support & Disability Services (2-800 Students' Union Building).

ACADEMIC SUPPORT CENTRE: Students who require additional help in developing strategies for better time management, study skills or examination skills should contact the Academic Support Centre (2-703 Students' Union Building).

Policy about course outlines can be found in section 23.4(2) of the University Calendar.

Disclaimer: Any typographical errors in this Course Outline are subject to change and will be announced in class. The date of the final examination is set by the Registrar and takes precedence over the final examination date reported in this syllabus, if any.

Note: Recording is permitted only with the prior written consent of the professor or if recording is part of an approved accommodation plan.

Copyright: Dr. D.M. Gingrich, Department of Physics, Faculty of Science, University of Alberta (2012)