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

University of Alberta

PHYS 530 Statistical Mechanics
Section B01
Winter Term 2013

Instructor: Prof. Doug Gingrich
Office: CCIS 2-097
Phone: 492-9501
E-mail: gingrich@ualberta.ca
Web Page: http://www.cpp.ualberta.ca/~gingrich/phys530/phys530.html

Lecture Room & Time: CCIS 4-285, 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: Fundamentals of classical and quantum statistical mechanics, with selected applications.

Course Objectives: Consolidate fundamental concepts of statistical mechanics; make the connection with thermodynamics; apply the formalism to simple physical systems.

Key to Success: Attend classes; do problem sets; read textbook.

Lecture Schedule & Assigned Readings: Please review your thermodynamics.

Week	Dates	Topic	Readings
1	8 Jan	Review of Thermodynamics	
1	10 Jan	Review of Thermodynamics	
2	15 Jan	Statistical Basis of Thermodynamics	Chapter 1
2	17 Jan	Statistical Basis of Thermodynamics	Chapter 1
3	22 Jan	Microcanonical Ensemble	Chapter 2
3	24 Jan	*No Lecture*	
4	29 Jan	*No Lecture*	
4	31 Jan	Canonical Ensemble	Chapter 3
5	5 Feb	Canonical Ensemble	Chapter 3
5	7 Feb	Canonical Ensemble	Chapter 3
6	12 Feb	Canonical Ensemble	Chapter 3
6	14 Feb	Grand Canonical Ensemble	Chapter 4
7	19 Feb	*Reading Week*	
7	21 Feb	*Reading Week*	
8	26 Feb	Formulation of Quantum Statistics	Chapter 5
8	28 Feb	Formulation of Quantum Statistics	Chapter 5
9	5 Mar	Formulation of Quantum Statistics	Chapter 5

9	7 Mar	Applications to Ideal Systems	Chapter 6
10	12 Mar	Applications to Ideal Systems	Chapter 6
10	14 Mar	Bose Statistics	Chapter 7
11	19 Mar	*No Lecture*	
11	21 Mar	*No Lecture*	
12	26 Mar	Bose Statistics	Chapter 7
12	28 Mar	Fermi Statistics	Chapter 8
13	2 Apr	Fermi Statistics	Chapter 8
13	4 Apr	Thermodynamics of the Early Universe	Chapter 9
14	9 Apr	Thermodynamics of the Early Universe	Chapter 9
14	11 Apr	Black Hole Thermodynamics	

Required Textbook: "Statistical Mechanics", R. K. Pathria & Paul D. Beale, Elsevier Butterworth- Heinemann, ISBN 978-0-12-382188-1 (note: third edition is required).

Other Useful References:

Introduction to Modern Statistical Mechanics, David Chandler
Statistical Physics, Reichl
Statistical and Thermal Physics, Hoch
Statistical Mechanics, Huang
Statistical Physics, Landau and Lifchitz
Equilibrium Statistical Physics, Plischke
Statistical Mechanics, Feynman

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.

EXAMS	**WEIGHTING**	**DATE**
Problem Sets	100%	various

Assigned Problems Sets: About 10 problem sets (for a total of about 50 problems), will be assigned throughout the semester. The problem sets are due at 4:30 p.m. Late submissions will not be accepted. Please put them in the box that is marked PHYS 530 near the elevators on L2 in CCIS. Do not put them under my door or in my mailbox.

Late and Missed Assignments: Late assignments will not be accepted and will be given a grade of zero. A student who cannot complete a 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.

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