

PHYSICS 308
Statistical, Molecular, Solid State Physics

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Course description:

The goal of this course is to familiarize students with the statistical description of ensembles of quantum particles. Particular emphasis is placed on the behaviour of molecules and crystalline solids.

Topics covered include classical and quantum statistics, fermions and bosons, molecular structure and spectra, molecular bonding, vibrational and rotational states, absorption, stimulated emission, population inversion, lasers, crystal structure, free-electron gas in metals, band theory of solids, semiconductors and semiconductor devices, superconductivity.

Prerequisites:

PHYS 208 or 271; MATH 115

N.B. This course cannot be used for credit towards Honours Physics and Mathematical Physics degree programmes.

Lectures: CAB 2-73, Tuesday and Thursday, 09:30 – 10:50

Office hours: Monday, Friday, 13:30 – 15:00 (or by appointment)

Textbook: *Modern Physics*, 4th Ed., Tipler and Llewellyn

Course content:

Chapters 8, 9, 10 of the textbook. Additional material will be given in lectures.

Examination schedule:

Midterm exam: Thursday, February 14, 09:30 – 10:50

Final exam: Wednesday, April 23, 09:00 – 12:00

Assignments:

Assignments will be set roughly every week. A written version of the problems will be handed out in class, and an electronic version will be posted on the class website. Assignments will be collected and graded. The assignment with the lowest grade will be dropped when calculating the final average.

Students may work co-operatively on assignment provided that each student submits his or her own assignment for grading.

Grading scheme:

Assignments: 25%
Midterm exam: 25%
Final exam: 50%

The following grading scheme will be applied at the end of the term by means of a grading curve appropriate for the class. The average mark for the class is expected to be around 2.8. This might be revised depending on the performance of the class as a whole.

<i>Descriptor</i>	<i>Letter Grade</i>	<i>Grade Point Value</i>
Excellent	A+	4.0
	A	4.0
	A-	3.7
Good	B+	3.3
	B	3.0
	B-	2.7
Satisfactory	C+	2.3
	C	2.0
	C-	1.7
Poor	D+	1.3
Minimal Pass	D	1.0
Failure	F	0.0

University policy regarding academic offences:

"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) and to 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."