



UNIVERSITY OF CALGARY
FACULTY OF SCIENCE
DEPARTMENT OF CHEMISTRY
COURSE OUTLINE
FALL 2016

COURSE: CHEMISTRY 373, Physical Chemistry II: Quantum Mechanics and Symmetry

LEC	DAYS	TIME	ROOM	INSTRUCTOR	OFFICE	PHONE	EMAIL	OFFICE HOURS
L01	TR	11:00-12:15	ENG 224	Dr. Belinda Heyne	SB 419	220-3887	bjmheyne@ucalgary.ca	TBA

TEXTBOOK: (**OPTIONAL**) *Physical Chemistry*, 3rd Edition, Thomas Engel and Philip Reid.

TOPICS COVERED AND SUGGESTED READING:

(Sections marked as Supplemental will not be included)

Introduction to quantum theory – Chapters 12, 13, 14

Simple quantum mechanical systems – Chapters 15, 16

Commuting and non-commuting operators – Chapter 17

Vibrations and rotations of diatomic molecules – Chapter 18

Atomic structure and spectra – Chapters 20, 21, 22

Molecular structure and bonding – Chapters 23, 24, parts of 26 (in relation to the computational labs)

Molecular symmetry - Chapter 27

LABORATORY EXPERIMENTS:

1. The Uncertainty Principle
2. The Absorption of Linear Polyene Dyes
3. Introduction to Spartan and use to Construct Models for Molecular Symmetry and Point Groups
4. Character Tables – Part I
Character Tables – Part II
5. AM1 calculations for selected molecules, assigning symmetry to orbitals and to vibrations
6. Mini research project