

CHEM*2070

Course Outline

Summer 2016

Ver. 9 May 2016

Course name: Structure and Spectroscopy

A theoretical and practical introduction to molecular spectroscopy. Rotational, vibrational, electronic and magnetic resonance spectroscopies will be studied, including basic principles and instrumentation, theory and applications, and specific language used. The use of spectroscopic techniques in studying molecular structure and dynamics in chemical and biological systems will be illustrated.

After completing the course, the student is expected to understand (1) the underlying principles of spectroscopy, (2) what kind of information could be extracted from each of the main types of molecular spectroscopy and (3) how to read and interpret simple spectroscopic data using acquired knowledge and reference book or database resources.

Credit weight: 0.5**Prerequisite:** CHEM*2060 Structure and Bonding.**Website:** <http://www.chemistry.uoguelph.ca/soldatov/c2070>

Instructor: Prof. Dmitriy Soldatov E-mail: dsoldato@uoguelph.ca
Office: MACN-338 (x53548)
Lab: MACN-343 or 348 or 351

Lectures: Mon, Wed, Fri 10:30 - 11:20 MCLN-101
Tutorials: Fri 9:00 - 10:20 MCLN-101
Final exam: Tue, 16 Aug 19:00 - 21:00 TBA
Office hours: Mon 14:00 - 17:00 MACN-338

For a detailed schedule of classes, assignment deadlines and exam dates/times see the course website.

Course Contents:

Introduction to Spectroscopy	A,B
Rotational Spectroscopy (Microwave & Raman)	C
Vibrational Spectroscopy (IR & Raman)	D
Electronic Spectroscopy (UV/Vis, PE)	E
Magnetic Resonance Spectroscopy (NMR & ESR)	F,G

For a detailed course description see pages 2-4 in Lecture Notes.

Evaluation: [total marks 100]

Assignment 1, Exam 1	[10,22]	A-C
Assignment 2, Exam 2	[10,22]	D,E
Assignment 3, Exam 3	[12,24]	F,G

Required text: *CHEM*2070 Lecture Notes.*

Optional texts available at the Library Reserve Desk:

Physical Chemistry. 9th Ed., 2010

Authors: Atkins PW & De Paula J

Code: QD 453.3.A74 2010

OR

Physical Chemistry. 8th Ed., 2006

Authors: Atkins PW & De Paula J

Oxford University Press, Freeman, NY

Fundamentals of Molecular Spectroscopy. 4th Ed. 1994

Authors: Banwell CN & McCash EM

Code: QD 96.M65B36 1994

OR

Fundamentals of Molecular Spectroscopy. 2nd Ed. 1972

Authors: Banwell CN

Code: QD 95.B33 1972

(Previously used text)

Modern Spectroscopy. 2004

Author: Hollas JM

Code: QC 451.H65 2004

Structure and Spectra of Molecules. 1985

Author: Richards WG & Scott PR

Code: QC 454.M6 R54

(A good very simple introduction)

General policies and regulations:

E-mail Communication: As per university regulations, all students are required to check their university e-mail account regularly: e-mail is the official route of communication between the university and its students.

When You Cannot Meet a Course Requirement: When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, advise the course instructor in writing, with your name, id#, and e-mail contact. Follow the following link for regulations and procedures for Academic Consideration: <http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Drop Date: The last date to drop the course, without academic penalty, is **8 July 2016**. For regulations and procedures for Dropping Courses, see Undergraduate Calendar: <http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Copies of out-of-class assignments: Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

Accessibility: The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Student Accessibility Services (SAS) as soon as possible. For more information, contact SAS at 519-824-4120 x56208 or email csd@uoguelph.ca or see the website: <http://www.uoguelph.ca/csd/>

Academic Misconduct: The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor. The Academic Misconduct Policy is detailed in the Undergraduate Calendar: <http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Recording of Materials: Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

Resources: The Academic Calendars are the source of information about the university procedures, policies and regulations which apply to undergraduate, graduate and diploma programs: <http://www.uoguelph.ca/registrar/calendars/index.cfm?index>