UNIVERSITY OF CALGARY
DEPARTMENT OF BIOLOGICAL SCIENCES
COURSE OUTLINE

1. Course: BCEM 551 – Structural Biology

Lecture Sections:	**L01:**	MWF	10:00	SA235	Winter 2017

Course Coordinator : Dr. H.J. Vogel

Instructors:	**Dr. H.J. Vogel**	**BI 423**	**403-220-6006**	**vogel@ucalgary.ca**
	Dr. M.E. Fraser	**BI 413**	**403-220-6145**	**frasm@ucalgary.ca**
	Dr. B. Mickiewicz	**BI 421**	**403 220-8356**	**bmmickie@ucalgary.ca**

D2L course name: 2017W BCEM 551 L01 - Structural Biology
Biological Sciences Department BI 186; 403-220-3140; biosci@ucalgary.ca

2. **PREREQUISITES:** One of Biochemistry 341 or 393, and one of Biochemistry 471 or Chemistry 371.
See section 3.5.C in the Faculty of Science section of the online Calendar
(http://www.ucalgary.ca/pubs/calendar/current/sc-3-5.html)

3. **GRADING**: The University policy on grading and related matters is described in "Academic Regulations, sections F.1 and F.2" of the online University Calendar (**http://www.ucalgary.ca/pubs/calendar/current/f-1.html** and **http://www.ucalgary.ca/pubs/calendar/current/f-2.html**) In determining the overall grade in the course the following weights will be used:

Midterm Exam (Monday, March 06, 2017)	**40%**
Assignments from Dr. Vogel	**10%**
Assignments from Dr. Fraser	**10%**
Final Exam (scheduled by the Registrar's office)	**40%**

There will be a three-hour final exam scheduled by the Registrar's office.

Percent grades will be translated to letter grades as follows:

A+ 92%;	**A 86%;**	**A- 81%;**	**B+ 77%;**	**B 74%;**	**B- 70%**
C+ 66%;	**C 62%;**	**C- 58%;**	**D+ 54%**	**D 50%;**	**F <50%**

Each piece of work (assignments, midterm exam or final examination) submitted by the student will be assigned a percentage score. The student's average percentage score for the various components listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade.

4. **Missed Components of Term Work**. The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in section 3.6: **http://www.ucalgary.ca/pubs/calendar/current/sc-3-6.html**. It is the student's responsibility to familiarize himself/herself with these regulations. See also **http://www.ucalgary.ca/pubs/calendar/current/e-3.html**.

5. Dates and times of class exercises held outside of class hours

Midterm Exam	**Monday, March 6, 2017 6:00-9:00 pm**	**TBA**

REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY. If you have a clash with this out-of-class-time-activity, please inform your instructor as soon as possible so that alternative arrangements may be made for you.

6. **EXAMINATION POLICY**: No electronic or written aids (eg. cell phones, tablets, computers, PDAs, notes, textbooks) will be allowed during writing of any exams. Non-programmable calculators will be permitted to answer quantitative questions on exams, if applicable, and permission to do this will be clearly indicated on the examination paper. Students should also read the Calendar, Section G, on Examinations: **http://www.ucalgary.ca/pubs/calendar/current/g.html**.

7. In this course, the quality of the student's writing will be a factor in the evaluation of the student's work. See also

http://www.ucalgary.ca/pubs/calendar/current/e-2.html.

8. Course Material: TEXT: Recommended: NMR in Biological Systems, Chary, K.V.R. and Govil, G., Springer (available from Dr. Vogel)

Required: Crystallography Made Crystal Clear, Rhodes, Gale. Academic Press. 3rd Edition (Paperback).

9. STUDIES IN THE BIOLOGICAL SCIENCES INVOLVE THE USE OF LIVING AND DEAD ORGANISMS. See also **http://www.ucalgary.ca/pubs/calendar/current/e-5.html**.

10. OTHER IMPORTANT INFORMATION FOR STUDENTS:

(a) ACADEMIC MISCONDUCT (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under K. Student Misconduct (http://www.ucalgary.ca/pubs/calendar/current/k.html) to inform yourself of definitions, processes and penalties

(b) ASSEMBLY POINTS in case of emergency during class time. Be sure to FAMILIARIZE YOURSELF with the information at http://www.ucalgary.ca/emergencyplan/assemblypoints.

(c) Student Accommodations: Students needing an Accommodation because of a Disability or medical condition should contact Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities available at http://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities_0.pdf.

Students needing an Accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, preferably in writing, to the Associate Head of Biological Sciences, Dr. H. Addy by email addy@ucalgary.ca or phone 403 220-3140.

(d) SAFEWALK: Campus Security will escort individuals day or night http://www.ucalgary.ca/security/safewalk). Call 403-220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.

(e) FREEDOM OF INFORMATION AND PRIVACY: This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). As one consequence, students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information see also
http://www.ucalgary.ca/secretariat/privacy.

(f) Student Union Information: VP Academic Phone: 403 220-3911 Email: suvpaca@ucalgary.ca
SU Faculty Rep. Phone: 403 220-3913 Email: science1@su.ucalgary.ca, science2@su.ucalgary.ca and science3@su.ucalgary.ca;
Student Ombuds Office: 403 220-6420 Email: ombuds@ucalgary.ca; http://ucalgary.ca/provost/students/ombuds

(g) INTERNET and ELECTRONIC COMMUNICATION DEVICE Information. You can assume that in all classes that you attend, your cell phone should be turned off. Also, communication with other individuals, via laptop computers, Blackberries or other devices connectable to the Internet is not allowed in class time unless specifically permitted by the instructor. If you violate this policy you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.

(h) Calculators can be used during examinations.

(i) At the University of Calgary, feedback provided by students through the Universal Student Ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses (www.ucalgary.ca/usri). Your responses make a difference – please participate in USRI Surveys.

Department Approval: ORIGINAL SIGNED Date: _____

Associate Dean's Approval for out of regular class-time activity: ORIGINAL SIGNED Date: _____

2017 TENTATIVE LECTURE SCHEDULE

Jan 09	Introduction to Spectroscopy	HJV
11	Introduction to NMR	HJV
13	NMR nuclei	HJV
16	NMR: magnets and imaging	HJV
18	NMR chemical shifts	HJV
20	NMR: relaxation I	HJV
23	NMR: relaxation II	HJV
25	NMR of amino acids, peptides & proteins	HJV
27	NMR of amino acids, peptides & proteins	HJV
30	NMR of amino acids, peptides & proteins	HJV
Feb 01	NMR of amino acids, peptides & proteins	HJV
03	NMR structure calculations	HJV
Feb 06	NMR of carbohydrates	HJV
08	Larger NMR structures	HJV
10	NMR of ligand binding	HJV
13	NMR of ligand binding	HJV
15	NMR of drug design	HJV
17	NMR Structural Aspects Review	HJV
20	***Family Day – No Lectures***	
19-26	***Reading Week – No Lectures***	
27	Metabolomics with NMR	BM
Mar 01	Metabolomics with NMR	BM
03	NMR of living systems	BM
06	Overview of protein crystallography	MEF
08	Overview of protein crystallography	MEF
10	Protein crystals	MEF
13	Geometric principles of diffraction	MEF
15	Geometric principles of diffraction	MEF
17	Geometric principles of diffraction	MEF
20	Collecting X-ray diffraction data	MEF
22	Collecting X-ray diffraction data	MEF
24	Diffraction data to electron density	MEF
27	Obtaining phases: Introduction and isomorphous replacement	MEF
29	Obtaining phases: Anomalous scattering	MEF
31	Obtaining phases: Molecular replacement	MEF
APR 03	Table 1: How crystallographers describe their data	MEF
05	Electron density maps: Obtaining the molecular model. Refinement	MEF
07	PDB files and model validation	MEF
10	Table 1: How crystallographers describe their models	MEF
12	Review of protein crystallography	MEF

Final Exams: April 15-26, 2017