



# UNIVERSITY OF CALGARY

## DEPARTMENT OF BIOLOGICAL SCIENCES COURSE OUTLINE

### 1. Course: **CMMB 421 - VIROLOGY**

Lecture Section(s)	L01	MWF	10:00	PF 120	Fall 2014
<b>Instructor(s):</b>	Dr. D.G. Storey Dr. K.E. Sanderson Dr. Morck Dr. Hynes Dr. M. Czub Dr. G. van Marle Dr. H. Schaetzl	BI 196	220-5274		<a href="mailto:storey@ucalgary.ca">storey@ucalgary.ca</a> <a href="mailto:kesander@ucalgary.ca">kesander@ucalgary.ca</a> <a href="mailto:dmorck@ucalgary.ca">dmorck@ucalgary.ca</a> <a href="mailto:hynes@ucalgary.ca">hynes@ucalgary.ca</a> <a href="mailto:mmczub@ucalgary.ca">mmczub@ucalgary.ca</a> <a href="mailto:vanmarle@ucalgary.ca">vanmarle@ucalgary.ca</a> <a href="mailto:hschaetzl@ucalgary.ca">hschaetzl@ucalgary.ca</a>

Course website: <http://homepages.ucalgary.ca/~ceri/cmmb421prot/virusanimation/index.html>

Biological Sciences Department BI 186 403-220-3140 biosci@ucalgary.ca

### 2. Prerequisites: **Biochemistry 393 and Cellular Molecular and Microbial Biology 343; and one of Biology 311 or Medical Sciences 341; as well as one of Biology 331 or Medical Sciences 351.**

See section 3.5.C in the Faculty of Science section of the online Calendar  
[www.ucalgary.ca/pubs/calendar/current/sc-3-5.html](http://www.ucalgary.ca/pubs/calendar/current/sc-3-5.html)

**NOTE:** Prior completion of or concurrent registration in BCEM 401 or 443 is strongly recommended.

### 3. Grading: The University policy on grading and related matters is described sections [F.1](#) and [F.2](#) of the online University Calendar. In determining the overall grade in the course the following weights will be used:

<b>Midterm Exams</b>	<b>30 % (2x 15%)</b>	<b>In Class (Oct 6 and Nov 7)</b>
<b>Group Work</b>	<b>5%</b>	
<b>Term Paper</b>	<b>20 %</b>	
<b>Seminar, abstract</b>	<b>15 %</b>	
<b>Final Exam</b>	<b>30%</b>	

\* There will be a final exam scheduled by the Registrar's office

Each piece of work (assignment, laboratory report, midterm test 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, bearing in mind that an F grade will result if the student does not pass the overall lecture component.

### 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](#). It is the student's responsibility to familiarize himself/herself with these regulations. See also [Section E.6](#) of the University Calendar

### 5. Scheduled out-of-class activities: Dates and times of approved class activities held outside of class hours. N/A

**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. Course Materials:** Acheson, N.H. Fundamentals of Molecular Virology. Wiley & Sons, 2<sup>nd</sup> Edition

**Online Course Components: Course Website** "<http://homepages.ucalgary.ca/~ceri/cmmb421prot/virusanimation/index.html>

Contains animations of the Viral life cycles. Top Hat classroom response system. Note: Top Hat is allowed for all classes and may be used for grades. Instructors using Top Hat should plan to accommodate students who do not have access to a cell phone or portable computing device.

**7. Examination Policy:** Students should also read the Calendar, [Section G](#), on Examinations.

**8. Writing across the curriculum statement:** e.g. "In this course, the quality of the student's writing in Term paper will be a factor in the evaluation of those reports. See also [Section E.2](#) of the University Calendar.

**9. Human studies statement:** Not applicable

**ETHICS IN THE BIOLOGICAL SCIENCES**

Studies in the Biological Sciences involve the use of living and dead organisms. Students taking laboratory- and field-based courses in these disciplines can expect involvement with and experimentation on such materials. Students perform dissections on dead or preserved organisms in some courses. In particular courses, students experiment on living organisms, their tissues, cells, or molecules. Sometimes field work requires students to collect a variety of living materials by many methods, including humane trapping.

All work on humans and other animals conforms to the Helsinki Declaration and to the regulations of the Canadian Council on Animal Care. The Department strives for the highest ethical standards consistent with stewardship of the environment for organisms whose use is not governed by statutory authority. Individuals contemplating taking courses or majoring in one of the fields of study offered by the Department of Biological Sciences should ensure that they have fully considered these issues before enrolling. Students are advised to discuss any concern they might have with the Undergraduate Program Director of the Department.

**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 [Section K](#). Student Misconduct 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 on [assembly points](#).

**(c) Academic Accommodation Policy:** Students with documentable disabilities are referred to the following links: [Calendar entry on students with disabilities](#) and [Student Accessibility Services](#).

**(d) Safewalk:** Campus Security will escort individuals day or night (<http://www.ucalgary.ca/security/safewalk/>). Call 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 (FOIPPA). 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

**(f)** <http://www.ucalgary.ca/secretariat/privacy>.

**(g) Student Union Information:** [VP Academic](#) Phone: 220-3911 Email: [suypaca@ucalgary.ca](mailto:suypaca@ucalgary.ca).  
SU Faculty Rep. Phone: 220-3913 Email: [sciencerep@su.ucalgary.ca](mailto:sciencerep@su.ucalgary.ca); [Student Ombudsman](#)

**(h) Internet and Electronic Device Information:** You can assume that in all classes that you attend, your cell phone should be turned off unless instructed otherwise. 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.

**(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](http://www.ucalgary.ca/usri)). Your responses make a difference - please participate in USRI Surveys.

Department Approval \_\_\_\_\_ Date \_\_\_\_\_

M421 F14; 8/28/2014 11:39 AM

COURSE OUTLINE

**CMMB 421 - VIROLOGY**

TERM:

Fall 2014

SECTION NO: 01

**PREREQUISITES:**

BCEM 393 and CMMB 343 and Biology 311 or Medical Science 341 and Biology 331 or Medical Science 351

**NOTE:**

Prior completion of or concurrent registration in BCEM 401 or 443 is strongly recommended.

A student may not register in a course unless they have a grade of at least C- in each prerequisite course.

COURSE COORDINATOR: D.G. Storey

BI 196A

220-5274

storey@ucalgary.ca

Animations: <http://homepages.ucalgary.ca/~ceri/cmmb421prot/virusanimation/index.html>

Library tutorial Information: <http://libguides.ucalgary.ca/content.php?pid=55723&sid=462214#1415665>

LECTURES:

MWF

10:00

PF 120

TUTORIALS:

TUT 01 R

09:00

SA 123

TUT 02 R

12:00

SA 125

TUT 03 R

15:00

SA 123

TEXT: Required: Acheson, N.H. Fundamentals of Molecular Virology. Wiley & Sons, 2<sup>nd</sup> Edition

RESERVE READING ROOM:

See attached

MARK DISTRIBUTION:

A.

Composition of Final Grade

**\*Midterm Exams (2)**

**30**

**(Oct 6 and Nov 7 in class)**

**Group Work**

**5**

**Term Paper**

**20**

**Seminar, abstract**

**15**

**Final Exam**

**30**

**100**

B.

Final Exam

There will be a Final Examination scheduled by the Registrar's Office.

**\*Midterm will be held in class**

Letter Grade

Mark Cut-off

A+ >

90

A

85

A-

80

B+

77

B

73

B-

70

C+

67

C

63

C-

60

D+

55

D

50

F

<50

**CMMB 421**  
**TERM PAPER AND SEMINAR PROJECT**

**Term Paper:**

The topics of this year's term paper are to be announced in the first tutorial. You may cover the development of methods or their application in either a broad sense or with regard to a specific virus and anything within the context of the topic that is of interest to you and you need not clear the topic with me in advance. The paper is to be a research paper therefore your points must be supported with data in the form of figures or tables. All data must be referenced to the original articles using the style used in Journal of Virology. The paper must be a minimum of 5 and maximum of 7 double-spaced typed pages (min. font size of 12 with 1" margins), not including cover page, figures, tables, and references. The figures and tables should appear at the end of the paper and not be incorporated into the text. The paper is due in class on **OCT 17, 2014 at 4.30 (5%/day late penalty)**.

**Seminar and Abstract:**

Each student will present a seminar complete with an abstract as part of the course's objectives. The seminar/abstract serves two functions in your development as students. First, it allows you to become familiar with the Virology literature by requiring you to delve into the primary source journals of this field. Secondly it affords you an opportunity to develop communications skills in a relatively friendly and low pressure format. Most people find it difficult to speak before an audience, however, this is an important skill for science graduates to develop. The objective of the seminar is to train you in this skill. By allowing you to present before a small group of your friends the pressure level is reduced, this ensures that the first seminar you may be asked to give will not have your career hanging in the balance. To make this as pressure free as possible you may choose the topic of your seminar; this way you are able to speak on a subject that interests you and that you feel comfortable discussing. There are 2 caveats that apply to the selection of your topic; 1) The 2-3 papers that you use as your primary source must be research papers in virology (reviews are not acceptable) from 2010-2012, and 2) only a limited number of presentations will be allowed on any research topic. The topics can be claimed on a first come-first serve basis by sending me a PDF of the papers you wish to use for your talk.

In your seminar you should 1] give an introduction to the topic (what you are going to talk about and why you are interested in the area); 2] describe basically how the experiment was done (don't go into too much detail but make the study comprehensible), 3] present the results from the study showing the figures and graphs presented in the paper) and interpret these for the audience, 4] summarize the findings of the paper(s) with your critique of the studies presented, and 5] relate the findings of the papers presented to the state of knowledge in the field (is what they did important in understanding the basics of the virus or its activity). I will mark the seminar on presentation first and content second. I will meet with the students, at your request, to discuss how you did and how you can improve your presentation, within the context of your own style (I don't believe there is only one way to give a seminar, you have to be comfortable with speaking to a group we will deal with how can we help you maximize your presentation within your own comfort zone). You will have 12 min. to talk and 5 min of questions. The day before your presentation you must send me the final version of your powerpoint presentation so I can put all the student presentation together on one computer. You will not be able to use your own computer for the presentation. You must hand in an abstract to me during the lecture on **November 12 in class (5% /day late penalty)**. During that tutorial we will organize the student presentations, so make sure you attend that tutorial. Abstracts are to be no more than 250 words and divided into sections labeled A) introduction, B) methods C) Results and D) conclusions. The seminars will be presented in a random order so you should be ready to speak on the first day of seminars.

**Books**  
**Virology Journals**

"Journal of Virology". Med Lib.  
"Journal of General Virology". Med Lib.  
"Virology". Med Lib.  
"Archives of Virology" originally called "Archives fur die gameste virusforschung". Med. Lib.  
"Intervirology". Med. Lib.  
"Cell". Both Libs.  
"Proceedings of the National Academy of Sciences USA". Both Libs.  
"Journal of Molecular Biology". Both Libs.  
"Microbiological Reviews", formerly "Bacteriological Reviews". Both Libs.  
"Scientific American". Both Libs.  
"Ann Rev Biochem". Both Libs.  
"Ann Rev Microbiol". Both Libs.  
"Ann Rev Cell Biol". Both Libs.

**Other Virology Sources not on Reserve**

"Comprehensive Virology". Frankel-Conrat and Wagner, 12 volumes now available. Main Library OR 357F73 Med. Lib. QW 160724.  
"Current Topics in Microbiology and Immunology". 75 volumes of review articles. Main Library.  
"Progress in Medical Virology". 22 volumes of review articles. Located in Reference Section of Medical Library.  
"Annual Review of Microbiology"  
"Annual Review of Biochemistry"  
"Annual Review of Genetics"  
"Microbiology 1977", 1978, etc. A volume each year.  
"Advances in Virus Research". Review articles.  
"Monographs in Virology". Medical Library.  
"Virology Monographs". Main Library QR 360A1V57 Med. Lib. QW 160N55

**VIROLOGY 2014**

<b>Lectures</b>			<b>Tutorials</b>		
Sept.	8	M	Introduction		DGS
	10	W	Virus Morphology	Sept 11 No Tutorial	DGS
	12	F	Virus Morphology		DGS
	15	M	Virus Growth	Sept 18 How to do a literature search and prepare a quality Bibliography (Group Work)	DGS
	17	W	Virus Analysis		DGS
	19	F	Virus Purification		DGS
	22	M	Host-Virus Interaction		DGS
	24	W	Host-Virus Interaction	Sept 25 Viral paper discussion	DGS
	26	F	<u>Ebola virus Outbreak Discussion</u>	Group Work	MC
	29	M	SMALL DNA VIRUSES (Parvovirus)		MC
Oct	01	W	Papilloma virus	Oct. 2 Q and A Review	MC
	03	F	(-) STRAND RNA VIRUSES (Rabies and Paramyxoviruses)	Group Work	DGS
	06	M	<u>Midterm 1 in class (15%)</u>	Oct. 9 Editorial advice on papers and research	DGS
	08	W	Influenza Virus		DGS
	10	F	Reovirus		DGS
	13	M	THANKSGIVING		
	15	W	(+) STRAND RNA VIRUSES	Oct.16 Assignment Prep	DGS
	17	F	Picornavirus, Flavivirus		DGS
	20	M	Coronavirus	<u>Oct. 23</u> Prion Research presentation (Dr. Schaetzel)	DGS
	22	W	LARGER DNA VIRUSES (Adenovirus)		DGS
	24	F	Herpesvirus and latency		DGS
	27	M	VIRUSES THAT USE Reverse Transcriptase (Retrovirus) / HIV		DGS
	29	W	Transcriptase (Retrovirus) / HIV	Oct 30 review Group Work	GvM
	31	F	Hepadnavirus		DGS
Nov	03	M	Plant viruses	Nov. 06 review session	MH
	05	W	Plant viruses	Group Work	MH
	07	F	<u>Midterm 2 in class (15 %)</u>		DGS
	10	M	Reading Day		
	12	W	Bacteriophage	Nov 13 Seminars (15%)	KES
	14	F	Bacteriophage		KES
	17	M	Bacteriophage		KES
	19	W	Bacteriophage	Nov. 20 Seminars	KES
	21	F	Bacteriophage		KES
	24	M	Giant viruses and evolution		KES
	26	W	Virus Pathogenesis	Nov. 27 Seminars	DM
	28	F	Antiviral Drugs		DM
Dec.	01	M	Virus Immunology & Vaccines		DGS
	03	W	Virus Immunology & Vaccines	Dec 04 Seminars	DGS
	05	F	Epidemiology		DGS

Nov12 Seminars Abstracts Due

Oct 17 Term Paper Due (20%)