



# UNIVERSITY OF CALGARY

## DEPARTMENT OF BIOLOGICAL SCIENCES COURSE OUTLINE

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

Lecture Section(s)	L01	MWF	10:00	ST 126	Fall 2017
TUTORIALS:	TUT 01	R	09:00	ST 027A	
	TUT 02	R	12:00	ST 125	
	TUT 03	R	15:00	ST 125	

Course Coordinator: Dr. M.F. Hynes

**Instructor(s):** Dr. M.F. Hynes      BI 429C      220-8473      [hynes@ucalgary.ca](mailto:hynes@ucalgary.ca)  
 Dr. D.G. Storey      BI 196      220-5274      [storey@ucalgary.ca](mailto:storey@ucalgary.ca)

**Course website:** D2L under CMMB 421

Biological Sciences Department      BI 186      403-220-3140      [biosci@ucalgary.ca](mailto: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 11 and Nov 8, 2017)</b>
<b>Term Paper</b>	<b>20 %</b>	<b>(Due October 23, 2017)</b>
<b>Seminar</b>	<b>10 %</b>	<b>(Titles/Description due Nov 2, 2017)</b>
<b>Final Exam</b>	<b>40 %</b>	

\* There will be a **cumulative** 3 hour final exam scheduled by the **Registrar's office**

Each piece of work (assignment, 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 according to the conversion scale provided in this course outline.

Final Grade Conversion Scale (from percent to letter grade) :

- A+: 90 or higher ( $\geq 90\%$ )
- A : 85 and above but under 90 ( $\geq 85\%, < 90\%$ )
- A- : 80 and above but under 85 ( $\geq 80\%, < 85\%$ )
- B+: 77 and above but under 80 ( $\geq 77\%, < 80\%$ )
- B : 73 and above but under 77 ( $\geq 73\%, < 77\%$ )
- B- : 70 and above but under 73 ( $\geq 70\%, < 73\%$ )
- C+: 66 and above but under 70 ( $\geq 66\%, < 70\%$ )
- C : 63 and above but under 66 ( $\geq 63\%, < 66\%$ )
- C- : 60 and above but under 63 ( $\geq 60\%, < 63\%$ )
- D+: 55 and above but under 60 ( $\geq 55\%, < 60\%$ )
- D : 50 and above but under 55 ( $\geq 50\%, < 55\%$ )
- F : below 50 ( $< 50\%$ )

### 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.3 of the University Calendar

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

6. **Course Materials:** Acheson, N.H. Fundamentals of Molecular Virology. Wiley & Sons, 2<sup>nd</sup> Edition
7. **Examination Policy:** No aids (electronic, written notes, or textbooks) will be permitted during exams except non-programmable calculators if required to answer mathematical questions. Permission to use calculators will be clearly indicated on the exams. Some questions on midterm and final exams **may** be assigned ahead of the exam; in this case the student may prepare an answer before the exam, but will be required to write the answer without notes or aids during the exam period. Such questions, if present, will always be optional (i.e. students can choose to answer other questions instead). Students should also read the Calendar, Section G, on Examinations.
8. **Writing across the curriculum statement:** In this course, the quality of the student's writing on Exams, the Term Paper, and Description of their seminar will be a **major** factor in the evaluation of those course components. 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) **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](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](mailto: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 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 <http://www.ucalgary.ca/secretariat/privacy>.
- (f) **Student Union Information:** VP Academic Phone: 403 220-3911 Email: [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca)  
SU Faculty Rep. Phone: 403 220-3913 Email: [science1@su.ucalgary.ca](mailto:science1@su.ucalgary.ca), [science2@su.ucalgary.ca](mailto:science2@su.ucalgary.ca) and [science3@su.ucalgary.ca](mailto:science3@su.ucalgary.ca);  
Student Ombuds Office: 403 220-6420 Email: [ombuds@ucalgary.ca](mailto:ombuds@ucalgary.ca); <http://ucalgary.ca/provost/students/ombuds>
- (g) **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.
- (h) 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.

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

**Term Paper:**

The topics of this year's term paper will be announced in the first tutorial and posted to D2L before that. Students may also propose their own original topic provided they clear it with Dr. Hynes. The paper will take the form of a minireview, and will normally be 4-6 pages long, double-spaced (not including references or figures and tables (maximum 3 figures and/or tables)). See more detailed explanation given in tutorial or on **D2L**. The paper is due on **OCT 23 2017** and is to be submitted electronically and in print. There will be a late penalty of 5 % per 12 hour period or part thereof for assignments not submitted on time.

**Seminar**

Students will be required to give a brief presentation of a recent scientific paper (2015 or later) about a virus of their choice. A title of the presentation, a brief description of the virus, and a short summary in lay terms of what the paper means must be submitted by November 02, 2017. Actual talks will be given during the tutorial sessions, and will be scheduled with input from students as to their schedules. See D2L for complete details and advice.

**Tutorials**

In addition to providing a time slot for students to present seminars in a small group, informal setting, the tutorial time slots will be used to give guidance on writing the term paper and doing the seminar, and to answer questions and go over material before each midterm and final exam. The following is a **tentative** schedule, and will be confirmed on D2L by the second week of classes.

Sept 14	No tutorial
Sept 21	Writing term papers, what is a minireview ?, referencing
Sept 28	No tutorial
Oct 5	Exam preparation/Review Session
Oct 12	Abstracts and seminars information session
Oct 19	Optional. Help with term paper
Oct 26	No tutorial
Nov 2	Abstracts due, Schedule talks. Midterm 2 review
Nov 9	No tutorial
Nov 16	Student seminars
Nov 23	Student seminars
Nov 30	Student seminars
Dec 7	Any remaining seminars; Final exam review

**Tentative** Schedule of Lectures for CMMB 421. May be updated if changes in schedules of guests occur.

MFH = Michael Hynes DGS= Doug Storey MC= Markus Czub CC = Carla Coffin GvM = Guido van Marle

SG = Sabine Gilch , DB = Dean Brown

Sept	11	M	Introduction to Virology	MFH
	13	W	Virus morphology	MFH
	15	F	Virus morphology	MFH
	18	M	Isolation, purification, enumeration of viruses	MFH
	20	W	Molecular analysis of viruses	MFH
	22	F	Viral growth, infection and replication strategies	MFH
	25	M	Bacteriophages -History, Importance, Classification	MFH
	27	W	Single stranded RNA phages	MFH
	29	F	Single stranded DNA phages -Inoviruses and Microviruses	MFH
Oct	02	M	Podoviruses: T7 and relatives	MFH
	04	W	Myoviruses: T even phages and relatives	MFH
	06	F	Temperate phages, Lysogeny, and Biology of Lambda,	MFH
<i>October 9 is Thanksgiving Monday (No Classes)</i>				
	11	W	<b>MIDTERM 1 (in class)</b>	MFH
	13	F	Viruses of Archaea	MFH
	16	M	Abortive infection, CRISPRs and other defenses	MFH
	18	W	Giant viruses, virophages and evolution of viruses	MFH
	20	F	Plant viruses and viroids	MFH
	23	M	Plant viruses and viroids	MFH
	25	W	Viral pathogenesis	DB
	27	F	Antiviral drugs	DB
	30	M	Viruses of insects and other invertebrates	MFH
Nov	01	W	+ strand RNA viruses of mammals: Picornaviruses,	MFH
	03	F	+ strand RNA viruses: Coronaviruses and Flaviviruses	MFH
	06	M	- Strand RNA viruses (Paramyxo and Rhabdoviruses)	MFH
	08	W	<b>MIDTERM 2 (in class)</b>	MFH
<i>November 10-13 are Reading Days (Remembrance Day) (No Classes)</i>				
	15	W	Retroviruses	GvM
	17	F	HIV	GvM
	20	M	Prions	SG
	22	W	Parvoviruses and Circoviruses	MC
	24	F	Papillomaviruses or Ebolavirus	MC
	27	M	Orthomyxoviruses, Influenza	DGS
	29	W	Adenoviruses	DGS
Dec	01	F	Herpes viruses and latency	DGS
	04	M	Virus immunology and vaccines	DGS
	06	W	Epidemiology of virus diseases	DGS
	08	F	Hepatitis virus B	CC