



UNIVERSITY OF CALGARY
 FACULTY OF SCIENCE
 DEPARTMENT OF BIOLOGICAL SCIENCES
 COURSE OUTLINE

1. Course: CMMB 527 - IMMUNOLOGY

Lecture Section: L01 MWF 15:00-15:50 ST 139 WINTER 2019

Lab Sections: B01 Thursday 9:00-11:50 BI 175
 B02 Thursday 12:00-2:50 BI 175
 B03 Thursday 3:00-5:50 BI 175

Coordinator: Dr. Constance Finney

Instructors: Dr. Constance Finney BI 461 220-2687 constance.finney@ucalgary.ca
 Dr. L. Gedamu BI 350 220-5556 lgedamu@ucalgary.ca
 Dr M. Mody cmody@ucalgary.ca
 Dr E. Cobo ecobo@ucalgary.ca

LAB STAFF: Heidi Gibson EEEL 301b/BI 175

D2L Course Website: CMMB527 Winter 2019

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

NOTE: Students must use their UofC account for all course correspondence.

Students are expected to be familiar with Section SC.4.1 of the University Calendar.

2. PREREQUISITE(S): Biology 311 and 331 and CMMB 343 and one of BCEM 401 or 443
 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 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:

Quizzes	12 %	Ongoing, see course schedule below and on D2L
Midterm Exam 1	18 %	Monday 4th March (in class)
Lab	32 %	Quizzes (3.5%), Lab reports (13.5%), Lab Exam (15%)
Final Exam	38 %	Set by Registrar

(There will be a final exam scheduled by the Registrar's office.)

Each piece of work (quiz, 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.

The student cannot pass the course as a whole unless they have passed (>50%) at least one component of the lab-based examinations (reports or exam) and one component of the lecture based examinations (midterm or final exam).

Letter Grade	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
Min. Percent Required	92	88	84	80	76	72	68	64	60	56	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:** Open Lab (March 15, 2019), there is an open lab session where at least one member of each pair of students will need to come to the lab outside of the regular lab times. A sign-up sheet will be available with multiple time slots to allow students the greatest flexibility.

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:** TEXT: Required: CMMB 527 Lab Manual (posted on D2L)
Recommended: Owen, et al. Kuby Immunology. 8th Edition 2013. W.H. Freeman & Co.

Online Course Components: Some teamwork resources are provided by ITPMetrics, a University of Calgary-based system of secure web-based tools for forming teams and doing peer evaluations. These tools are free to all students and are not dependent on prior access.

7. **Examination Policy:** All examinations are closed book. The use of camera devices, MP3 Players and headphones, or wireless access devices such as cell phones, Blackberries, etc., during the examination will not be allowed. Calculators are not allowed for this examination. 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 in laboratory reports will be a factor in the evaluation of those reports. See also [Section E.2](#) of the University Calendar.
9. **Human & living organism studies statements:**

Students will not participate as subjects or researchers in human studies.
See also Section E.5 of the University Calendar.

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. Reappraisal of grades:

A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request a reappraisal. Non-academic grounds are not relevant for grade reappraisals. Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See Section I.3 of the University Calendar.

- a. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **15 days** of either being notified about the mark, or of the item's return to the class. If the student is not satisfied with the outcome, the student shall immediately submit the Reappraisal of Graded Term work form to the department in which the course is offered. The department will arrange for a reassessment of the work if, and only if, the student has sufficient academic grounds. See sections I.1 and I.2 of the University Calendar
- b. **Final Exam:** The student shall submit the request to Enrolment Services. See Section I.3 of the University Calendar.

11. Other Important Information For Students:

- a. **Mental Health** The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, Mental Health Services Website) and the Campus Mental Health Strategy website (Mental Health).
- b. **SU Wellness Center:** The Students Union Wellness Centre provides health and wellness support for students including information and counselling on physical health, mental health and nutrition. For more information, see www.ucalgary.ca/wellnesscentre or call 403-210-9355.

- c. **Sexual Violence:** The University of Calgary is committed to fostering a safe, productive learning environment. The Sexual Violence Policy (<https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf>) is a fundamental element in creating and sustaining a safer campus environment for all community members. We understand that sexual violence can undermine students' academic success and we encourage students who have experienced some form of sexual misconduct to talk to someone about their experience, so they can get the support they need. The Sexual Violence Support Advocate, Carla Bertsch, can provide confidential support and information regarding sexual violence to all members of the university community. Carla can be reached by email (svsa@ucalgary.ca) or phone at 403-220-2208.
- d. **Misconduct:** 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. Examples of academic misconduct may include: submitting or presenting work as if it were the student's own work when it is not; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; collaborating in whole or in part without prior agreement of the instructor; borrowing experimental values from others without the instructor's approval; falsification/fabrication of experimental values in a report. **These are only examples.**
- e. **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on assembly points.
- f. **Academic Accommodation Policy:** 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 [procedure-for-accommodations-for-students-with-disabilities.pdf](#). Students needing an accommodation in relation to their coursework or to fulfill requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Associate Head, Undergraduate of the Department of Biological Sciences, Heather Addy by email addy@ucalgary.ca or phone 403 220-6979. Religious accommodation requests relating to class, test or exam scheduling or absences must be submitted no later than **14 days** prior to the date in question. See Section E.4 of the University Calendar.
- g. **Safewalk:** Campus Security will escort individuals day or night (See the Campus Safewalk website). Call 403-220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.
- h. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). 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 Legal Services website.
- i. **Student Union Information:** VP Academic, Phone: 403-220-3911 Email: suvpaca@ucalgary.ca. SU Faculty Rep., Phone: 403-220-3913 Email: sciencerep@su.ucalgary.ca. Student Ombudsman, Email: suvpaca@ucalgary.ca.
- j. **Internet and Electronic Device Information:** Unless instructed otherwise, cell phones should be turned off during class. All communication with other individuals via laptop, tablet, smart phone or other device is prohibited during class unless specifically permitted by the instructor. Students that violate this policy may be asked to leave the classroom. Repeated violations may result in a charge of misconduct.
- k. **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction (USRI) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference - please participate in these surveys.

Department Approval _____ ORIGINAL SIGNED _____ Date _____

Associate Dean Approval
Out-Of-Class Time Activity: _____ ORIGINAL SIGNED _____ Date _____

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TENTATIVE LECTURE & LAB SCHEDULE 2019 (Exact sequence may differ slightly)

Day	Date	Lecture	Instructor
Fri	11-Jan	(1) Intro	Finney
Mon	14-Jan	(2) Overview of Innate & Acquired Immunity	Finney
<u>Wed</u>	<u>16-Jan</u>	<u>(3) Cells of the Immune System (Workshop 1)</u>	<u>Finney</u>
Thurs	17-Jan	Lab 1: Organs of Immune System (technique mark)	
Fri	18-Jan	(4) Tissues & Organs of the Immune System	Finney
Mon	21-Jan	(5) Pattern Recognition and Signalling	Finney
<u>Wed</u>	<u>23-Jan</u>	<u>(6) Innate Effectors (Workshop 2)</u>	
Thurs	24-Jan	Lab 2: Antibody purification	<u>Finney</u>
Fri	25-Jan	(7) Innate Effector Mechanisms	Cobo
Mon	28-Jan	(8) Leukocyte Migration	Cobo
Wed	30-Jan	(9) Acute & Chronic Inflammation	Cobo
Thurs	31-Jan	Lab 3: Electrophoresis	
Fri	01-Feb	(10) Antigens	Cobo
Mon	04-Feb	(11) Ig Structure and Function (1)	Cobo
Wed	06-Feb	(12) Ig Structure and Function (2)	Cobo
Thurs	07-Feb	No Lab	
<u>Fri</u>	<u>08-Feb</u>	<u>(13) Antigen-Ab Interactions (Workshop 4)</u>	<u>Finney</u>
Mon	11-Feb	(14) Ig Genetics	Finney
Wed	13-Feb	<u>(15) T cell Receptor Genetics (Workshop 5)</u>	
Thurs	14-Feb	Lab 4: ELISA	<u>Finney</u>
Fri	15-Feb	(16) MHC Genetics - Structure	Finney
Mon	18-Feb	READING WEEK	
Wed	20-Feb	READING WEEK	
Thurs	21-Feb	READING WEEK	
Fri	22-Feb	READING WEEK	
<u>Mon</u>	<u>25-Feb</u>	<u>(17) Antigen Processing and Presentation (Workshop 6)</u>	<u>Finney</u>
Wed	27-Feb	(18) Immune Assays 1	Finney
Thurs	28-Feb	Lab 5: Immunofluorescence/Western Blot (technique mark)	
Fri	01-Mar	(19) Immune Assays 2	Finney
Mon	04-Mar	Midterm (lectures 1-17)	
Wed	06-Mar	(20) Immune Assays 3	Finney
Thurs	07-Mar	No Lab	
Fri	08-Mar	(21) Cell Mediated Immunity - T cell ontogeny	Mody
Mon	11-Mar	(22) Cell Mediated Immunity - TCR	Mody
Wed	13-Mar	(23) Cell Mediated Immunity - TCR signalling	Mody
Thurs	14-Mar	Lab 6: Gel Diffusion	
Fri	15-Mar	(24) Cell Mediated Immunity - Cytokines	Mody
Mon	18-Mar	(25) Cell Mediated Immunity - Cytokine Signalling	Mody
Wed	20-Mar	(26) Cell Mediated Immunity - Effector Responses (T, NK, mophage)	Mody
Thurs	21-Mar	Labs 7: Lymphocyte purification	
Fri	22-Mar	<u>(27) Immunology & Society (workshop 7)</u>	<u>Finney</u>
<u>Mon</u>	<u>25-Mar</u>	<u>(28) Hypersensitivity (Workshop 8)</u>	<u>Finney</u>
Wed	27-Mar	(29) Tolerance and Automimmunity	
Thurs	28-Mar	No Lab	<u>Finney</u>

Fri	29-Mar	(30) Immunodeficiency	Finney
<u>Mon</u>	<u>01-Apr</u>	<u>(31) Transplantation (Workshop 9)</u>	<u>Finney</u>
Wed	03-Apr	(32) Pathogens & the Immune System - Leishmania	Gedamu
Thurs	04-Apr	No Lab	
<u>Fri</u>	<u>05-Apr</u>	<u>(33) Vaccines</u>	<u>Gedamu</u>
<u>Mon</u>	<u>08-Apr</u>	<u>(34) Pathogens & the Immune System - Intestinal worms (Workshop 10)</u>	<u>Finney</u>
Wed	10-Apr	(35) Student Choice	Finney
Thurs	11-Apr	Lab Exam	
Fri	12-Apr	(36) FINAL REVIEW SESSION	Finney

Learning Outcomes

By the end of this course (CMMB527: Immunology), successful students will be able to:

1. Compare and contrast components of the immune system.
2. Illustrate how the immune system evolved, and how it develops within vertebrates.
3. Distinguish innate from adaptive immune responses.
4. Demonstrate proficiency in basic immunological laboratory techniques such as the ELISA assay.
5. Differentiate between immune assays and defend the use of a particular assay in a given situation.
6. Relate immune responses to real-world examples, such as infectious disease, transplants and allergies.