



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 127 WINTER 2017

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. I. Waheed

Instructors: Dr. I. Waheed BI 446 ishrat.waheed@ucalgary.ca
Dr. L. Gedamu BI 350 220-5556 lgedamu@ucalgary.ca
Dr. E. Cobo HSC 2519 210-7247 ecobo@ucalgary.ca
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LAB STAFF: Heidi Gibson EEL 301b/BI 132 220-5851

D2L Course Website: CMMB527 Winter 2017

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

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	10%	Ongoing, see course schedule on D2L
Midterm Exam 1	15 %	Friday Feb. 10 (in class)
Midterm Exam 2	15 %	Wednesday March 15 (in class)
Lab	30 %	
Final Exam	30 %	

(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 at least one component of the lab based examinations (reports or exam) and one component of the lecture based examinations (midterm or final exam).

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

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. 7th Edition 2013. W.H. Freeman & Co.
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 studies statement:** indicating whether students in the course may be expected to participate as subjects or researchers. See also [Section E.5](#) of the University Calendar.

STUDIES IN THE BIOLOGICAL SCIENCES INVOLVE THE USE OF LIVING AND DEAD ORGANISMS. Students are expected to be familiar with <http://www.ucalgary.ca/pubs/calendar/current/sc-5-1.html> of the on-line calendar.

See also <http://www.ucalgary.ca/pubs/calendar/current/e-5.html>.

10. OTHER IMPORTANT INFORMATION FOR STUDENTS:

- (a) **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.
- (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.
- 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 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: suypaca@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 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) **U.S.R.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 _____

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Letter grade conversion scheme for CMMB527:

90 =	A+
85 =	A
80 =	A-
77 =	B+
73 =	B
70 =	B-
66 =	C+
62 =	C
60 =	C-
55 =	D+
50 =	D
below 50	F

TENTATIVE LECTURE & LAB SCHEDULE 2017 (Exact sequence may differ slightly)

<u>Day</u>	<u>Date</u>	<u>Lecture</u>	<u>Instructor</u>
Mon	Jan-9	(1) Intro	Waheed
Wed	Jan-11	(2) Overview of Innate & Acquired Immunity	Waheed
Thurs	Jan-12	Lab 1: Organs of Immune System (technique mark)	
<i>Fri</i>	<i>Jan-13</i>	<i>(3) Cells of the Immune System</i>	Waheed
Mon	Jan-16	(4) Tissues & Organs of the Immune System	Waheed
Wed	Jan-18	(5) Pattern Recognition and Signalling (Quiz 1 on lectures 1-4)	Waheed
Thurs	Jan-19	Lab 2: Antibody purification	
<i>Fri</i>	<i>Jan-20</i>	<i>(6) Innate Effectors</i>	Waheed
Mon	Jan-23	(7) Innate Effector Mechanisms	Waheed
Wed	Jan-25	(8) Leukocyte Migration (Quiz 2 on lectures 5-7)	Waheed
Thurs	Jan-26	Lab 3: Electrophoresis	
<i>Fri</i>	<i>Jan-27</i>	<i>(9) Acute & Chronic Inflammation</i>	Waheed
Mon	Jan 30	(10) Antigens	Cobo
Wed	Feb-01	(11) Ig Structure and Function (1)	Cobo
Thurs	Feb-02	No Lab	
<i>Fri</i>	<i>Feb-03</i>	<i>(12) Ig Structure and Function (2)</i>	Cobo
Mon	Feb-06	(13) Antigen –Ab Interactions	Cobo
Wed	Feb-8	(14) Ig Genetics	Cobo
Thurs	Feb-9	Lab 4: ELISA	
<i>Fri</i>	<i>Feb-10</i>	<i>Midterm 1 (Lectures 1-13)</i>	<i>Waheed</i>
Mon	Feb-13	(15) T cell Receptor Genetics	Cobo
Wed	Feb-15	(16) MHC Genetics - Structure	Waheed
Thurs	Feb- 16	Lab 5: Immunofluorescence/Western Blot (technique mark)	
<i>Fri</i>	<i>Feb. 17</i>	<i>(17) Antigen Processing and Presentation (Quiz 3 on lectures 14-16)</i>	<i>Waheed</i>
<i>Mon</i>	<i>Feb-20</i>	<i>Reading Week</i>	
<i>Wed</i>	<i>Feb-22</i>	<i>Reading Week</i>	
<i>Thurs</i>	<i>Feb- 23</i>	<i>Reading Week</i>	
<i>Fri</i>	<i>Feb- 24</i>	<i>Reading Week</i>	
Mon	Feb- 27	(18) Cell Mediated Immunity - T cell ontogeny	Mody
Wed	Mar-01	(19) Cell Mediated Immunity - TCR	Mody
Thurs	Mar-02	No Lab	
<i>Fri</i>	<i>Mar-03</i>	<i>(20) Cell Mediated Immunity - TCR signalling</i>	<i>Mody</i>
Mon	Mar-06	(21) Cell Mediated Immunity - Cytokines	Mody
Wed	Mar-08	(22) Cell Mediated Immunity - Cytokine Signalling	Mody
Thurs	Mar-9	Lab 6: Gel Diffusion	
<i>Fri</i>	<i>Mar-10</i>	<i>(23) Cell Mediated Immunity - Effector Responses (T, NK, mophage)</i>	<i>Mody</i>
Mon	Mar-13	(24) Immunology & Society	Mody
Wed	Mar-15	Midterm 2 (lectures 14-23)	Waheed
Thurs	Mar-16	No Lab	
<i>Fri</i>	<i>Mar-17</i>	<i>(25) Immune Assays 1</i>	<i>Waheed</i>
Mon	Mar-20	(26) Immune Assays 2	Waheed
Wed	Mar-22	(27) Immune Assays 3	Waheed
Thurs	Mar-23	Labs 7 & 8: Lymphocyte purification	
<i>Fri</i>	<i>Mar-24</i>	<i>(28) Hypersensitivity</i>	<i>Waheed</i>
Mon	Mar- 27	(29) Immune regulation and tolerance	Waheed
Wed	Mar- 29	(30) Autoimmunity (Quiz 4 on lectures 24-29)	Waheed
Thurs	Mar- 30	No Lab	
<i>Fri</i>	<i>Mar- 31</i>	<i>(31) Immunodeficiency & transplant</i>	<i>Waheed</i>

Mon	Apr-03	(32) Pathogens & the Immune System - Leishmania	Gedamu
Wed	Apr-04	(33) Vaccines	Gedamu
Thurs	Apr-06	Lab Exam	
Fri	Apr-07	(34) Pathogens & the Immune System - Intestinal worms	Waheed
Mon	Apr-10	(35) The immunology of cancer (Quiz 5 on lectures 30-34)	Waheed
Wed	Apr-12	(36) FINAL REVIEW SESSION	Waheed

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.