

BISC414 Introduction to IMMUNOLOGY

Lecture Times: MWF
9:00 to 9:50
Lecture Location: Shoemaker 303

Instructor: R. Brian Doctor, PhD
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Credit Hours: 3 hours

Prerequisites: BISC 160 series (160, 161, 162, 163) General Biology

Communication:

E-Mail Is the most reliable means of getting me a message.
If I need to contact individual students, I will generally use their e-mail.

Social Media Nope

Phone Feel free to call but do NOT leave me a message. If I am free in my office I will gladly pick up but I do NOT replay my messages.

Office Hours NO appointment needed; just come on by at the listed times.

Mondays 12:00 to 1:00

Tuesdays 11:00 to 12:00

Wednesdays 12:00 to 1:00

Drop-in Feel free to drop by my office in the afternoon on Mondays, Wednesdays or Fridays or any time on Tuesdays or Thursdays. If I am there and free I would be delighted to talk with you. If I am in the middle of something I will set up a time for you to come back.

Appointment Send me an e-mail with the dates/times you can come by and I will reserve you that time.

Mail Box Do NOT leave materials or assignments for me in the first floor mailboxes; I will NOT get them in a timely fashion. To drop off assignments when I am not in, slide the pages under my office door (an e-mail indicating you did so is a good idea).

Blackboard I use Blackboard to communicate with the class as a whole. This includes class messages, powerpoint lecture slides, homework assignments and test scores.

Course Description: The course will provide students with a broad exposure to the fundamental principles and functions of the immune system. The breadth of learning ranges from the structural and functional features of the organs and cells of the immune system to the molecular mechanisms that account for the detection and destruction of pathogens by the immune system. Once the normal function of the immune system is covered, the consequences of a variety of pathophysiologic conditions that arise when the normal balance of the immune system is altered will be examined.

Course Organization: The course will be presented in roughly four quarters.

Quarter 1: provides a broad look at immunology that includes the history of immunology as a science, a description of the cells and organs that comprise the immune system and the cytokine signaling system that accounts for the communication within the immune system

Quarter 2. begins by describing the innate immune system and the roles of the complement system. Turning to the adaptive immune system, the course then describes lymphocyte receptor genes and proteins as well as the MHC proteins

Quarter 3. Covers in detail the molecular and cellular mechanisms that direct the development, the antigen-driven activation and the resulting response of the adaptive immune response (i.e. T- and B-cells).

Quarter 4. Shifts gears and looks at the role of immunizations in preventing infectious diseases and the diseases that arise when there is an imbalance in the immune system (e.g. anaphylaxis, chronic inflammation, autoimmune diseases, AIDS, etc.)

Learning Objectives: After successfully completing this course, each student will have a broad understanding of immunology and the immune system. This includes:

- having an appreciation of the historical emergence of immunology as a science
- knowing the features of the cells and tissues of the immune systems
- appreciating the bidirectional relationship between the innate and the adaptive immune systems
- understanding how these cells and tissues develop and function to detect and destroy an array of pathogens
- knowing how different types of inappropriate immune responses lead to a number of distinct morbidities.

Lecture Materials: Most lectures will follow powerpoint slides. Prior to each lecture, the powerpoint slides for that day's lectures will be posted on Blackboard. This is meant to facilitate note taking during lecture and direct you to points of significance while studying after lecture. Importantly, most of the exam questions are generated from the points made on the powerpoint slides.

Texts: *Kuby's Immunology*, 8th edition, Punt/Stranford/Jones/Owens

NOTE: To familiarize themselves with the topics and enhance their depth of learning from the lectures, students are highly encouraged to read the assigned material prior to lecture.

NOTE: The depth and breadth of the material is greater in the book than will be covered in the lectures. Students are encouraged to take the opportunity to self-teach themselves the additional material (and practice being in grad school).

Attendance Policy: Attendance will be tracked by scanning IDs in the classroom scanners prior to each lecture. In accordance with the University's new Attendance Verification Policy, each student MUST attend at least one lecture during the first two weeks AND scan in prior to the lecture. Subsequently, attendance is NOT mandatory but should facilitate student's mastering of the course material and is HIGHLY recommended. There is no direct penalty for the number of absences but students with poor attendance will get NO consideration for borderline grades when final grades are tallied (i.e. if you are 1 or 2 pts from the next higher grade you will not be given those points). Students with excellent attendance WILL get some consideration when their final scores are just below a grade cut-off. Students with medical or school-associated absences should provide notification and will not be counted as 'ABSENT'. Also, students away for graduate school interviews will not be counted 'ABSENT' with appropriate notification. Students should contact the instructor for other forms of excused absences.

Grades: There will be a total of 500 points possible by the end of the course. This includes FOUR quarterly exams worth 100 points each. There is NOT a separate cumulative final. There will also be a number of post-lecture homework assignments during the semester. The cumulative homework scores will be normalized to a 100 point scale and will be included on the final point total.

	<u>Max possible</u>
Exam 1	100 pts
Exam 2	100 pts
Exam 3	100 pts

Exam 4	100 pts
<u>Homework</u>	<u>100 pts</u>
TOTAL	500 pts

Exams Exam format is 50 multiple choice questions answered in a 50 minute class session. Exams will REQUIRE students to bring a blank scantron (882-E; half-page green scantron sheet) and #2 pencils. If there is not a class before ours, exams will begin 15 minutes early. If there is not a class scheduled in our room after our class, exam times will be extended 15 minutes.

Make Up Exams: Students that miss exams for legitimate, documented reasons can make up exams by contacting the instructor and working out a mutually agreeable and timely time.

Homework: Modest homework assignments will be given during the semester. The assignments may serve (i) to independently cover important areas that are not addressed specifically in lecture, (ii) to cover again areas of central importance, (iii) to revisit areas where the group struggled with difficult concepts or (iv) to assess if students are reading prior to lectured. Students are welcome to work with other students in the class to discuss the questions and formulate answers but the final responses/answers must be completed independently. Students are encouraged to explore different resources beyond the lecture materials and textbooks when formulating their answers. Homework turned in late may be subject to a 10%/day penalty for up to 50%. Despite the steep penalty, late homework is always graded and some points are better than taking a 0 for that assignment. Unless otherwise directed, ALL homework assignments should be generated on a computer and printed out on a printer (i.e. NO handwritten assignments).

Grading Scale: Grades will be curved to reflect the exam difficulty/class performance. In the past, the A and B levels had very little curve required but the C level received a fair bit of curve.

Academic Integrity Any form of academic misconduct (e.g. cheating, plagiarism, fabrication) will not be tolerated and may subject violators to a failing grade in the course. If you suspect someone around you of cheating, have the intestinal fortitude to let me know. They will hurt the grades of many in the class and will erode the integrity and respect of our institution.

Electronics Students are welcome to use laptops/tablets during lectures to take notes. ALL electronic devices should be muted. Use of electronic devices for non-class related tasks is counterproductive for the user, distracts and disrupts other students around the user and is strongly discouraged. If you are going to have non-class related items open, be considerate and sit in the back rows.

Students with Disabilities For students with acknowledged disabilities, efforts will be made to minimize the impact of the disability and maximize the student's ability to learn the course material and complete any testing or examination of the student's learning.

This syllabus is subject to change at the discretion of the instructor to accommodate instructional needs.

Lecture Topics and Related Reading:

#	Date	Chapter	Topic
00	JAN	20 th	MLK Day
01		22 nd	Introduction to IMMUNOLOGY
02		24 th	1 (p12-14) The ENEMY: Viruses and Bacteria
03		27 th	The ENEMY: Parasites and Fungi
04		29 th	1 (p2-11) History of IMMUNOLOGY
05		31 st	2 (p31-46) Immune System CELLS: Innate Cells
06	FEB	3 rd	Immune System CELLS Adaptive Cells
07		5 th	2 (p47-55) Lymphoid Organs: PRIMARY
08		7 th	2 (p56-64) Lymphoid Organs: SECONDARY
09		10 th	Lymphoid Organs: TERTIARY
10		12 th	3 (p91-99) CYTOKINES
11		14 th	3 (p105-108) Immune responses
12		17 th	14 (p512-521) Chemokines, Extravasation, Migration
EX		19 th	EXAM 1 (1-11)
13		21 st	4 INNATE Immunity I
14		24 th	INNATE Immunity II
15		26 th	5 COMPLEMENT I
16		28 th	COMPLEMENT II
17	MAR	2 nd	3 (p.75-85) ANTIBODY Structure
18		4 th	6 Lymphocyte Receptor Genes I
19		6 th	Lymphocyte Receptor Genes II
		9 th , 11 th , 13 th	Spring Break
20		16 th	9 B-Cell Development
21		18 th	11 B-Cell Activation I
22		20 th	B-Cell Activation II
EX		23 rd	EXAM 2 (13-22)
23		25 th	7 Major Histocompatibility Complex I
24		27 th	Major Histocompatibility Complex I
25		30 th	8 T-Cell Development
26	APR	1 st	10 T-Cell Activation I
27		3 rd	T-Cell Activation II
28		6 ^h	12 Effector Responses
29		8 th	Effector Responses
30		10 th	14 (p522-536) Immune Responses
EX		13 st	EXAM 3 (23-30)
31		15 th	17 Public Health, Sanitation, Vaccines

	17 th		GOOD FRIDAY
32	20 th	15 (p549-570)	Hypersensitivity Reactions I
33	22 nd	15 (p571-581)	Hypersensitivity Reactions II, III, IV
34	24 th	15 (p582-586)	Chronic Inflammation
35	27 th	16 (p602-616)	Autoimmunity
36	29 th	16 (p617-631)	Organ Transplant Immunity
37	1 st	18	Immunodeficiency diseases
		19	Cancer and the Immune System
EX	MAY	6 rd	EXAM 4 (30-38)