

# Principles of Immunology (Lecture)

## (BIO431/531)

### Fall 2022

**Instructor:** Dr. Catherine Miller, Ph.D.; cat.miller@maine.edu

**Office:** 476B-1 Science (C Wing)

**Office Hours:** Tuesday noon-2 PM and Wednesday 1-3 PM and by appointment

**Textbook:** Janeway's Immunobiology; by Kenneth Murphy and Casey Weaver; 9<sup>th</sup> Edition (Provided on Course Website)

**Lecture:** 11 AM-12:15 PM Monday and Wednesday; Payson Smith 44

**Course Overview:** An introduction to the fundamentals of immunology, especially as they relate to human diseases. Topics include history of immunology, basic elements of immune systems, principles of natural and acquired immunity, cellular and molecular basis of B cell and T cell development and diversity, and clinical aspects of immunology. Prerequisites: CHY 107 or CHY 115, junior standing, and grade of C- or higher in either BIO 107 or BIO 113; or permission of instructor. 3 Credit Hours.

#### Main Course Goals and Objectives:

- Understand the role(s) of the innate immune system in allowing for a functional adaptive immune system response to infection.
- Understand the role(s) of the adaptive immune system in allowing for a functional response to infection
- Understand the role of the adaptive immune system in memory development against pathogens
- Understand the role of immunoglobulins in the innate and adaptive immune response
- Understand the current vaccine platforms available to help fight infectious disease

#### Distribution of points:

Lecture Points	
Item	Total Points
Exam 1	100
Exam 2	100
Exam 3	100
Exam 4	100
Quiz 1	20
Quiz 2	20
Quiz 3	20
Quiz 4	20
Quiz 5	20
Quiz 6	20
Quiz 7	20
Quiz 8	20
<b>TOTAL:</b>	<b>560 points</b>

The final course grade will be determined by the total number of points received divided by the total number of points possible. Your final grade will be based on the following **Grading Scale:**

Percentage	Grade
92-100%	A
90-91.9%	A-
87-89.9%	B+
82-86.9%	B
80-81.9%	B-
77-79.9%	C+
72-76.9	C
70-71.9%	C-
67-69.9%	D+
60-66.9 %	D
below 59.9%	F

At the sole discretion of the instructor, students with exemplary class participation that are on the borderline between two grades (within 10 points) may receive the next highest grade.

**Grading Policy:** The final grade for the course is determined by dividing the total number of points earned by the total number of points possible and multiplying that number by 100%. The course consists of four exams (including the final exam) and eight quizzes. Exam and quiz format may include multiple choice, true/false, matching, short answer and essay type questions. Exam policies and procedures must be followed while taking the exam. The main exam procedures include no talking during the exam and bringing your USM ID. Possession of visible papers or talking, texting, or looking at your phone during the exam results in an automatic F for that exam and possibly for the entire course.

**Graduate Students:** All graduate students taking BIO 431 will write FOUR one-page papers on a topic related to the information covered in each Module section (Modules 1, 2, 3 and 4). Dr. Miller will provide additional details to graduate students directly and throughout the course.

### The Course Schedule (Tentative, Of Course)

Week	Lecture Topic(s)	Text Readings	
1	8.29	Introductory remarks-Syllabus review	
		The anatomy of the immune system	Chapter 1
2	9.5	<b>NO CLASS</b>	
		The anatomy of the immune system-CONT	Chapter 1
3	9.12	<b>QUIZ 1</b> ; Innate immunity	Chapter 2
		Complement	Chapter 2
4	9.19	Complement-CONT	Chapter 2
		Innate immune pattern recognition	Chapter 3
5	9.26	<b>QUIZ 2</b> ; Innate immune pattern recognition-CONT	Chapter 3
		<b>REVIEW for Exam 1</b>	
6	10.3	<b>EXAM 1</b>	
		Cytokines/Chemokines	Chapter 3
7	10.10	<b>NO CLASS</b>	
		<b>QUIZ 3</b> ; Antibodies/Antigen-recognition by T cells	Chapter 3
8	10.17	Ig and TCR gene rearrangement	Chapter 5
		<b>QUIZ 4</b> ; Ig and TCR gene rearrangement-CONT	Chapter 5
9	10.24	<b>REVIEW for Exam 2</b>	
		<b>EXAM 2</b>	
10	10.31	MHC-Antigen presentation to T-lymphocytes	Chapter 6
		<b>QUIZ 5</b> ; Lymphocyte receptor signaling	Chapter 7
11	11.7	Lymphocyte development and survival	Chapter 8
		<b>QUIZ 6</b> ; T cell-mediated immunity	Chapter 9
12	11.14	<b>REVIEW for Exam 3</b>	Chapter 10
		<b>EXAM 3</b>	
13	11.21	B-cell activation	Chapter 10
		<b>NO CLASS</b>	
14	11.28	<b>QUIZ 7</b> ; Immune response against pathogens	Chapter 11
		Immunological memory	Chapter 11
15	12.5	<b>QUIZ 8</b> ; Transplantation/tumor immunology	Notes only
		<b>REVIEW for Exam 4</b>	
16	12.12	Finals Week	
		<b>Final Exam Wednesday, December 14<sup>th</sup> @ 11AM</b>	

**Attendance:** Attendance at lectures **WILL NOT** be taken, and students are required to attend all lectures. It is the student's responsibility to obtain any lecture notes for the lecture sessions missed.

**Academic Integrity/Plagiarism:** Everyone associated with the University of Southern Maine is expected to adhere to the principles of academic integrity central to the academic function of the University. Any breach of academic integrity represents a serious offense. Each student has a responsibility to know the standards of conduct and expectations of academic integrity that apply to academic tasks. Violations of academic integrity include any actions that attempt to promote or enhance the academic standing of any student by dishonest means. Cheating on an examination, stealing the words or ideas of another (i.e., plagiarism), making statements known to be false or misleading, falsifying the results of one's research, improperly using library materials or computer files, or altering or forging academic records are examples of violations of this policy which are contrary to the academic purposes for which the University exists. Acts that violate academic integrity disrupt the educational process and are not acceptable.

Evidence of a violation of the academic integrity policy will normally result in disciplinary action. A copy of the complete policy may be obtained from the office of Community Standards and Mediation, online at [usm.maine.edu/community-standards-mediation/academic-integrity](http://usm.maine.edu/community-standards-mediation/academic-integrity) or by calling and requesting a copy at (207) 780-5242.

**Students with medical and/or professional obligations (sports, conferences, etc.):** These students must contact me **before** anticipated absences. Student-athletes – it is your responsibility to provide an **official** list (signed by the coach or athletic department's educational program coordinator) of anticipated absences related to sport participation. I will make necessary accommodations for quizzes and exams; however, it will be your responsibility to ensure there is not conflict with presentation dates and group work. You will be responsible for all material presented if you are absent.

**Disability Accommodations:** The university is committed to providing students with documented disabilities equal access to all university programs and services. If you think you have a disability and would like to request accommodations, you must register with the Disability Services Center. Timely notification is essential. The Disability Services Center can be reached by calling 207-780-4706 or by email [dscusm@maine.edu](mailto:dscusm@maine.edu). If you have already received a faculty accommodation letter from the Disability Services Center, please provide me with that information as soon as possible. Please make a private appointment so that we can review your accommodations.

**Title IX Statement:** The University of Southern Maine is committed to making our campuses safer places for students. Because of this commitment, and our federal obligations, faculty and other employees are considered mandated reporters when it comes to experiences of interpersonal violence (sexual assault, sexual harassment, dating or domestic violence, and stalking). Disclosures of interpersonal violence must be passed along to the University's Deputy Title IX Coordinator who can help provide support and academic remedies for students who have been impacted. More information can be found online at <http://usm.maine.edu/campus-safety-project> or by contacting Sarah E. Holmes at [sarah.e.holmes1@maine.edu](mailto:sarah.e.holmes1@maine.edu) or 207-780-5767.

If students want to speak with someone confidentially, the following resources are available on and off campus: University Counseling Services (207-780-4050); 24 Hour Sexual Assault Hotline (1-800-871-7741); 24 Hour Domestic Violence Hotline (1-866-834-4357).

**Tutoring and Writing Assistances:** Tutoring at USM is for *all* students, not just those who are struggling. Tutoring provides active feedback and practice, and is available for writing, math, and many more subjects. Walk-in tutoring is available at the Glickman Library in Portland, the Gorham Library, and the LAC Writing Center. For best service, we recommend making an appointment at <https://usm.maine.edu/learningcommons/schedule-tutoring-appointment>. Questions about tutoring should be directed to Naamah Jarnot at 207-780-4554. Interested in becoming a more effective, efficient learner? Check out <https://usm.maine.edu/agile>

**Counseling:** Counseling is available at USM. The best way to schedule an appointment is by phone at 780-5411. More information is available at <https://usm.maine.edu/uhrs>.

**Special SARS-CoV2 related issues:** Rapidly changing, may be updated/modified frequently. Dr. Miller will keep you up to date.

**Below you'll find a summary for information related to our most crucial student services and supports:**

- **Request disability accommodations** | (207) 780-4706 | [dsc-usm@maine.edu](mailto:dsc-usm@maine.edu)
- **Report Interpersonal violence** | (207) 780-5767 | [usm.titleix@maine.edu](mailto:usm.titleix@maine.edu)
- **Report On-Campus Emergencies and Safety Concerns** | (207) 780-5211 or your local police agency.
- **Get academic help** | [mycampus.maine.edu/group/usm/learning-commons1](http://mycampus.maine.edu/group/usm/learning-commons1)
- **Get technology help** | [usm.maine.edu/computing/helpdesk](http://usm.maine.edu/computing/helpdesk)
- **Meet with an Advisor** | [usm.maine.edu/advising](http://usm.maine.edu/advising)



**This syllabus may be changed WITH notice to students.**