

Infection and Immunity                      Biology 437/537                      Spring 2020  
Prerequisite: Biology 341 (or consent of the instructor)  
Instructor: Tom Kieft      Office: Jones Annex 301, Lab Jones Annex 302  
Phone: 835-5321, e mail: thomas.kieft@nmt.edu  
Office Hours: M&W 10-12 (I'm often available at other times, too.)

**Learning Objectives.** Following the completion of this course, students should have an appreciation for and understanding of

1. the human immune system
2. virulence mechanisms of infectious disease agents
3. many of the major infectious diseases of humans
4. how to read and interpret primary scientific literature
5. how to assemble and integrate scientific information on a topic and communicate it in writing and orally.

**Texts:** There is one required textbook for the immunology portion of the course:

Immunology: A Short Course, Seventh Edition, by Richard Coico and Geoffrey Sunshine. 2015. Wiley-Blackwell, Hoboken, NJ

There is not a textbook for the medical microbiology portion of the course. There are some useful general texts in case you want one. One such is:

Medical Microbiology, 8<sup>th</sup> Edition by Patrick R. Murray, Ken S. Rosenthal, and Michael A. Pfaller. 2016. Elsevier, ISBN: 978-0-323-29956-5

Brock's Biology of Microorganisms (Biol 341 textbook) is also very useful.

**Course materials on the web:** Some course materials will be made available via Canvas (<https://nmt.instructure.com>).

#### **Course policies:**

Exams will cover any and all material from lectures and reading assignments. No make-up exams will be given. If a student misses an exam due to a *bona fide*, documented illness or family emergency (must be documented to the satisfaction of the Dean of Students), then scores from the remaining exams will be prorated.

#### **Counseling and Disability Services**

**Reasonable Accommodations:** New Mexico Tech is committed to protecting the rights of individuals with disabilities. Qualified individuals who require reasonable accommodations are invited to make their needs known to the Office of Counseling and Disability Services (OCDS) as soon as possible. In addition, New Mexico Tech offers mental health and substance abuse counseling through the Office of Counseling and Disability Services. The confidential services are provided free of charge by licensed professionals. To schedule an appointment, please call 835-6619.

**Academic Honesty:** New Mexico Tech's Academic Honesty Policy can be found on page 79 of the NMT catalog (<https://www.nmt.edu/registrar/catalogs/2018-2019%20FINAL%2009-7-2018.pdf>) and starting on page 11 in the NMT Student Handbook

(<https://www.nmt.edu/policies/docs/studentpolicies/NMT%20Student%20Handbook%202018-19%20August.pdf>). You are responsible for knowing, understanding, and following this policy.

It is especially important for the two take-home exams that you fully understand how to properly cite all sources of information that you use and that you avoid plagiarism. Your take-home exam answers are essays, for which you must provide answers in your own words, but citing your sources of information. Note that paraphrasing is a form of plagiarism.

#### **Grading:**

**Exams:** Exams 1 and 2 will be in-class, closed book exams; exams 2 and 3 be essays written outside of class on assigned topics.

**Attendance and Participation** will account for 10% of the final grade.

Biol. 437: Each of the 4 exams will be weighted equally, i.e., 22.5% each.

Biol. 537: Each of the 4 exams will count for 18% of the final grade; in addition, a research proposal is required (due April 21), and presented informally to the rest of the class) and will count as 18% of the final grade.

Grades will be assigned on a scale of A-F, depending on test scores on a comparative basis across the class. Even if the average turns out to be extremely high, students scoring 90-100 are guaranteed an A, those scoring 80-90 are guaranteed a B or better, and those scoring 70-80 are guaranteed a C or better

**Tentative schedule with reading assignments:**

Date	Topic	Reading assignments
1/13	Intro, Review of Basic Microbiol., Overview of immunity	Coico Ch. 1
1/15	Innate immune system	Coico Ch. 2
1/17	Cells and organs of the immune system, antigens	Coico Ch. 3, 4
1/22	Antibodies	Coico Ch. 4, 5, 6
1/24	Antibodies	Coico Ch. 4, 5, 6
1/27	Antibodies	Coico Ch. 4, 5, 6
1/29	Antibodies	Coico Ch. 4, 5, 6
1/31	Antibody genes	Coico Ch. 7
2/3	MHC, Antigen processing	Coico Ch. 9, 10
2/5	T cells and T cell receptors	Coico Ch. 10, 11
2/7	Cytokines	Coico Ch. 12
2/10	Complement	Coico Ch. 14
2/12	Complement	Coico Ch. 14
2/14	Hypersensitivity: Type I (allergy)	Coico Ch. 15
2/17	<i>Scientific paper discussion #1</i>	
2/19	Review	
2/21	TBA	
2/24	TBA	
2/26	TBA	
2/28	<b>Exam #1</b>	
3/2	Hypersensitivity: Types II, III, and IV	Coico Ch. 16, 17
3/4	Autoimmunity	Coico Ch. 13
3/6	Autoimmunity	Coico Ch. 13
3/9	Vaccines	Coico Ch. 21
3/11	Diagnostic Principles, serology	Coico Ch. 6
3/13	Diagnostic Principles, serology	Coico Ch. 6
3/23	<b>Exam #2</b>	
3/25	Normal microbiota, epidemiology	
3/27	Pathogenicity: invasins and toxins	
3/30	<i>Scientific paper discussion #2</i>	
4/1	Introduction to bacterial pathogens, <i>Staphylococcus</i> , <i>Streptococcus</i>	
4/3	Survey of bacterial diseases, student presentations	
4/6	Survey of bacterial diseases, student presentations	
4/8	Survey of bacterial diseases, student presentations	
4/13	Survey of bacterial diseases, student presentations	
4/15	Viruses	
4/17	Survey of bacterial diseases, student presentations	
4/20	Survey of bacterial diseases, student presentations	
4/22	Survey of bacterial diseases, student presentations	
4/24	<i>Scientific paper discussion #3</i>	
4/27	Viruses, fungi, vector-borne disease	
4/29	Viruses, fungi, vector-borne disease	