

Prerequisites - BL101

Instructor - Dr. Engle

Office - 211 Pierce Hall

Phone - 814-886-6552

Office Hours - MWF 10:00 - 12:00; TR 12:00 - 1:00

Credit Hours - 3

Lecture - MWF 3:00 - 3:50; 003 Pierce Hall

Web page - <http://www.DrEngle.net>

Email - JEngle@mtaloy.edu

Text - Abbas, A.K., A.H. Lichtman, and S. Pillai. 2022. Cellular and Molecular Immunology 10th edition. Elsevier, Philadelphia, PA 587 pp. ISBN 978-0-323-75748-5

Course description - This course will introduce students to the structure and function of the immune system. The course will explore the development of B-cells and T-cells, immune effector mechanisms within humoral and cellular immunity, immunogenetics, and the role of the immune system in health and disease.

Grading Policy - There will be seven or eight exams in the class, depending on how far we get in lecture. Exams will occur as stated on the course outline. Exams will consist of multiple choice questions and short essay questions.

Research Paper: A written paper is required that is worth 50 points and is due **Friday 4 April**.

Students may choose to write their paper from one of the following two categories:

- Review a primary research paper that focuses on a leukocyte or an immune cytokine.
- Review a disease caused by immune responses.

Point distribution

- 5 pts. Introduction, 25 pts. Body, 5 pts. Conclusion, 5 pts. References, 10 pts. Overall
- Additional information is found later in this syllabus.

Grading Scale:

A=100-92% B+=91-88% B=87-83% C+=82-79% C=78-74% D=73-65% F=64-0%

Grades are NOT curved. Grades are based on the total amount of points accumulated. Other grades will be assigned as described in the College Catalog.

Additional Resources:

Optional texts:

Abbas, A.K. et al. 2008. Basic Immunology: Functions and Disorders of the Immune System 4th ed. Elsevier.

Coico, R. & G. Sunshine. 2009 Immunology A Short Course 6th ed. John Wiley-Blackwell

Delves, P.J. et al. 2006. Roitt's Essential Immunology 12th ed. Wiley-Blackwell.

Kindt, T.J. et al. 2007 Kuby Immunology 6th ed. W. H. Freeman & Co.

Murphy, K.M. et al. 2011. Janeway's Immunobiology 8th ed. Taylor & Francis.

Parham, P. 2009. The Immune System 3rd ed. Taylor & Francis.

Sompayrac, L.M. 2012. How the Immune System Works 4th ed. Wiley, John & Sons.

Wood, P. 2006 Understanding Immunology 2nd ed. Benjamin Cummings.

Library Resources:

Immunology by P.M. Lydyard. 2004. QR182.55 L93 2004

Case studies in immunology: a clinical companion by R.S. Geha. 2008. RC582 .R67 2008

Atlas of immunology by J.M. Cruse. 2004. QR182.C782003 1

The immune system by P. Parham. 2005. QR181 .P335 2005

Immunobiology: the immune system in health and disease 6th ed. by C. Janeway. 2005. QR181 .I397 2005

In addition to the above and below policies and procedures, the instructor reserves the right to alter, augment, or delete from existing policies in order to maintain the proper atmosphere for teaching and learning. All such policy changes will be announced.

Course Outline and Learning Objectives

Introduction to the Immune System Compare and contrast Innate and Adaptive Immunity. Describe and explain the function of the cells of the immune system. Describe the secondary lymphoid tissues.	<u>Chapter</u> 1 2
Exam 1	
Innate Immunity Describe the cellular receptors of the innate immune system. List and explain the functions of the components of the innate immune system. Describe the innate immune reactions.	4
Exam 2	
Antigen Capture and Presentation to Lymphocytes List the antigen presenting cells. Describe the structure and function of the Major Histocompatibility Complex molecules.	6
Exam 3	
Antibody and T cell receptor structure Describe the structure of antibodies and the T cell receptors.	5 7 (part)
Lymphocyte Development Describe the stages of B & T cell development Antigen Receptor Gene Rearrangement Explain how the DNA is rearranged in lymphocytes.	8
Exam 4	
T Cell-Mediated Immunity Describe the structure of the proteins in the T Cell Receptor (TCR) Complex. Describe the additional signaling of T cells. Explain the different responses of T cells.	7 (part) 9
Effector Mechanisms of T Cell-Mediated Immunity Contrast how CD4 ⁺ and CD8 ⁺ T cells participate in cell-mediated immune reactions. Compare and contrast the functions of Th1 and Th2 cells.	10 11
Exam 5	
Humoral Immune Responses Explain the intracellular signal in B cell activation. Review the functions of Th cells in humoral immune responses. Describe the various components of an antibody. Explain how class switching occurs and define affinity maturation. Explain how T-independent antigens produce antibody responses.	12
Effector Mechanisms of Humoral Immunity Describe the functions of antibodies. Recall the complement system cascade.	13
Exam 6	
Immunological Tolerance and Autoimmunity Explain why you don't make antibodies against yourself. Identify the organs responsible for tolerance.	15
Immune Responses Against Tumors and Transplants Describe the immune mechanisms of tumor eradication. Explain the mechanisms used to prevent tissue transplant rejection.	17 18
Exam 7	
Hypersensitivity Describe immediate hypersensitivity. Identify the hypersensitivity diseases caused by antibodies. Identify the hypersensitivity diseases caused by T lymphocytes.	19
Exam 8	

Immunology (BL 360) Paper Requirements

Topics:

Students may choose to write their paper from either of the following two categories:

- Review a primary research paper that focuses on a leukocyte (white blood cell) or an immune cytokine. The paper should contain 5-10 figures.
- Review a disease caused by immune responses.

General requirements:

A printed out stapled copy of the paper must be handed in on the due date and is worth fifty points.

The paper should be from five to six full pages long.

The layout should be 12 point text, double spaced, one inch margins, on 8.5 by 11 inch paper.

No Cover page. The first page should include your name in the upper left hand corner followed by a centered title with a blank line, then begin the text.

Each page (except the first page) should be numbered.

Indent paragraphs, and do not use I / we / you and quoting is highly discouraged.

At the end of the paper, a separate page should contain the cited references only.

Reference requirements:

A minimum of three peer reviewed references are required for the primary research paper review.

A minimum of six peer reviewed references are required for the disease paper.

Additional references may include web pages. Be sure to include the URL.

References should be single spaced with a blank line between each reference.

Different journals use different styles for references. For the primary research paper review, use the same reference style as the paper being reviewed. For the disease paper, choose a style from one of your references and use it consistently.

The minimum information in a single reference should include: author(s), article title, journal title, year of publication, volume, and page numbers of article.

A good guideline can be found at (<http://www.monroec.edu/depts/library/cbe.htm>).

Body requirements:

For the primary research paper, each experiment should be explained by including:

- what question the researchers are attempting to answer
- a brief description how the experiment is conducted
- what is the result(s) of the experiment
- any more questions raised by the experiment

For the disease paper, be sure to include:

- symptoms, what is happening at the molecular/cellular level, and treatment options

Point distribution: 50 points total

5 pts. Introduction - Provide background to the research or historical account of the disease.

25 pts. Body - This is the major content of the paper. Each point should be at least a paragraph. Be sure to include smooth transitions from point to point. See above for more information.

5 pts. Conclusion - Do not include new information here. Suggested items to include would be, highlights, what new information was discovered and what is the impact.

5 pts. References - See above.

10 pts. Overall - Includes grammar, spelling, page numbers on bottom of page, thought development (flow) and were the directions followed.

Notes:

- Don't cite ProQuest or other database used to find sources, it's like saying "I used a card catalog to find a book".
- Each reference should only contain one date and that date should be the date of publication not the date you accessed the article (except for non-dated internet sources).
- If you state dates in the paper use B.C. or A.D.
- Wikipedia is not an acceptable source to reference.

NO PLAGIARISM, ask the instructor if you don't know the "rules".

MAC Policies

Weather Delays and Compressed Schedule

In the event of a delayed opening, MAC will follow a compressed schedule. This will provide students with the opportunity to attend all scheduled classes on delay days with each class meeting for a shorter than usual session. For the Compressed Schedule for delay days, go to the following link: <http://www.mtaloy.edu/delays-cancelations>

Technology and Communication Assistance Statement

All students are expected to regularly log in to the Canvas course website. The site contains the syllabus and assignments, and supplementary materials will be placed there on a regular basis. Furthermore, important announcements will be posted on the site (especially if a class period is canceled due to weather, illness, etc.). For assistance in using Canvas, please contact the Canvas administrator at (Canvas@mtaloy.edu).

College offices and instructors often communicate important information through the MAC email system. Students should check their school email account regularly. For technical or log-in credential questions, please contact the help desk at (helpdesk@mtaloy.edu or 814-886-6502).

College Academic Integrity Statement

Mount Aloysius College is committed to the academic integrity of the entire community. All share responsibility for maintaining high standards of academic integrity, and no forms of academic dishonesty are tolerated. Forms of academic dishonesty include but are not restricted to: giving or receiving unauthorized assistance on an examination, project, or assignment; using unauthorized forms of assistance such as crib notes or cell phones on an examination; falsification of data or plagiarism (using another person's ideas or words as your own); and lying or falsifying reasons for missing examinations or class.

A student found guilty of lying, cheating, or plagiarism, depending on the nature of the offense and the history of the student, is usually subject to one or both of the following: a grade of zero on the assignment, project, or examination or a grade of F in the course. All cases of lying, cheating, or plagiarism where a punishment is incurred are reported to the Senior Vice President of Academic Affairs, who maintains a record of all offenses. Serial offenders may be subject to suspension or dismissal.

College Accommodations Statement

Mount Aloysius College is committed to providing reasonable accommodations to students with disabilities. Students with disabilities who wish to request an accommodation are required to contact Michele Leamer, Office Manager, Student Health and Wellness Center (MLeamer@mtaloy.edu or 814-886-6515) to formally request accommodations and provide supporting documentation. If you receive approval for accommodations, it is important that you stop in at the start of the semester so necessary arrangements can be made.

Attendance Policy

Attendance at all lecture and lab sessions is mandatory. It is your responsibility to notify the instructor **prior** to missing an exam or laboratory and you must have a valid reason. The instructor reserves the right to judge the validity of the excuse. If you miss an exam, you are responsible for taking the exam within one week of your return. There are no makeup labs unless you are able to come to another section during the same week and obtain instructor permission. *Failure of the student to follow the steps outlined above will result in a grade of "0" for the missed exam or lab!*

Conflict Resolution

Should a student encounter difficulty with course content or other aspects of the course, the first action should be to make an appointment to speak with the instructor. The instructor may suggest resources on campus or other tips to assist student learning. If a student has concerns with their instructor, then the best course of action is to seek out a meeting with the Science and Math Department Chair, Dr. John Whitlock, 814-886-6536, JWhitlock@mtaloy.edu. to discuss the difficulties. If an agreeable decision is not reached, the student should then request a meeting with the Dean, Dr. Chris Lovett, 814-886-6458, CLovett@mtaloy.edu. The Faculty, Department Chairs, and Deans are committed to treating all students with respect and fairness. Additional information is outlined in the academic grievance policy in the College catalog.

Title IX: Confidentiality and Responsible Employee Statement

Mount Aloysius College faculty are committed to creating a safe learning environment for all members of our community, free from gender and sex-based discrimination, including sexual harassment, domestic and dating violence, sexual assault, and stalking, in accordance with Title IX of the Education Amendments of 1972.

Please note that the Title IX and Sexual Misconduct Policy designates all faculty members, including teaching assistants, as "Responsible Employees". Under Mount Aloysius College's policy, all "Responsible Employees" must report all disclosures of sex or gender-based discrimination or violence to Mount Aloysius' Title IX Coordinator, Ms. Tonia Gordon, Vice President for People & Mission Integration/Chief Human Resource Officer, tgordon@mtaloy.edu or 814-886-6390. The Title IX Coordinator will reach out to provide resources, support, and information after receiving a report, but community members are not required to respond to such outreach. Reported information will remain private.

If you have (or someone you know has) experienced any form of sex or gender-based discrimination or violence and wish to speak with someone *confidentially*, please contact one of our counselors at counseling@mtaloy.edu or call 814-886-6515. For more information regarding Mount Aloysius College's Title IX procedures, reporting, or support measures, please visit sites.google.com/mtaloy.edu/titleix/home.

Disclosures of gender and sex-based discrimination or violence made in relation to an assignment and/or educational prompt will not result in a referral to Mount Aloysius College's Title IX Coordinator unless requested otherwise.