

BIOL 4550 / BIOL 6550: Immunology (Summer, 2023)

1. Course Information

- Course number and section: BIOL 4550 (CRN #: 52883), BIOL 6550 (CRN #: 52916)
- Hours of credit: 4
- Pre-requisites or co-requisites as listed in university catalogue: (BIOL 4550) (BIOL 1107K Minimum Grade: C or BIOL 2XM1 Minimum Grade: C and BIOL 2XML1 Minimum Grade: C) and (BIOL 1108K Minimum Grade: C or BIOL 2XM2 Minimum Grade: C and BIOL 2XML2 Minimum Grade: C) and BIOL 3100 Minimum Grade: C; (BIOL 6550) Admission into the graduate program or permission of the instructor.
- Classroom location and room number:
Lecture: M-R 12:45 pm – 2:10 pm, BC 2202
Lab: MW 2:30 pm – 5:20 pm, BC 3018

2. Instructor Information

- Instructor name: Dr. Jonghoon Kang
- Instructor contact: BC 2217, 229-333-7140, jkang@valdosta.edu
- **Instructor office hours: Tue & Thur 2:30 pm – 3:30 pm**

3. Course Description

- Introduction to basic concepts of immunology, including antigen and antibody structure, the generation of diversity, the nature of T cell and B cell receptors, cellular cooperation, and the down regulation of immune responses.
- Required texts, resources, and materials: “**How the Immune System Works**”, 6th Edition, by Lauren M. Sompayrac” from Wiley. ISBN: 978-1-119-54212-4. **Paper-based regular notebooks** and Pens or Pencils. You may need a **memory stick**.
- Required out-of-class activities: Reading lecture notes, presentation materials, the textbook, and any posted materials.

4. Standards, Goals, Objectives, or Outcomes

- Describe basic terminology in immunology.
- Describe the underlying physical and chemical principles in immunology.
- Demonstrate an understanding of basic computational techniques in immunology.
- Demonstrate literature analysis capability. Graduate students need to select papers to present in consultation with the instructor.
- Interpret clinical cases using basic principles of immunology.
- Demonstrate competency for the immunology part in standard tests such as MFT, MCAT, DAT, OAT, and PCAT.
- Perform research to publish (optional)

5. Assignments

- General description of the assignments: Students are required to read the textbook to be covered before and after class. Some additional materials will be posted on Blazeview and you need to study them before class. There will be two in-class tests, one lab test, and one final test.
- Policies for missed assignments, make-up assignments, late assignments, and/or extra credit: If you miss any assignment due to medical or family-related emergency you can have make-up

assignments as long as you prove the valid reason of your absence (doctor's notes). **Otherwise no make-up tests or labs!** And you will get a zero point for the missing part. Late assignments will not be accepted. If you miss the lab more than three times for any reasons, you won't pass this course. So, make sure that you attend all lectures as well as labs.

6. Assessment Policy

Total Score (U) = 200 (In Class Exam) + 100 (Lab Practical) + 300 (Final) = 600

Total Score (G) = 200 (In Class Exam) + 100 (Lab Practical) + 100 (Presentation) + 300 (Final) = 700

Total score (%)	Grade
$\geq 90\%$	A
$\geq 80\%$	B
$\geq 60\%$	C
$\geq 40\%$	D
$< 40\%$	F

All exams are open-notebook exams. You can use your own handwritten notebooks. You are not allowed to use any other materials such as printed or copied materials, laptops, or your cellphone during exam. In the lab exam, you can use anything including the internet, but no communications with other people.

7. Schedule (all schedule is tentative and may be subject to change)

Date	Class	Date	Lab
6/7 – 6/8	1 An Overview	6/7	Introduction; Syllabus
6/12 – 6/15	1 An Overview 2 The Innate Immune System 3 B Cells and Antibodies	6/12 – 6/14	How to read scientific papers? Focusing on the units and t test statistics
6/19 – 6/22	3 B Cells and Antibodies 4 The Magic of Antigen Presentation	6/19	<i>Juneteenth Holiday</i>
		6/21	ImageJ [14,15,16] Systems of Equations and Logarithms Mathematical Analysis of Gel Electrophoresis
6/26 – 6/29	5 T Cell Activation 6 T Cells at Work EXAM 1 (100 points) 6/28 7 Secondary Lymphoid Organs and Lymphocyte Trafficking	6/26 – 6/28	Thermodynamics and Kinetics for Immunology [2,5,6,7]
7/3 – 7/6	7 Secondary Lymphoid Organs and Lymphocyte Trafficking 8 Restraining the Immune System	7/3	Documentary
		7/5	History of Immunology [1]
7/10 – 7/13	9 Self Tolerance and MHC Restriction 10 Immunological Memory 11 The Intestinal Immune System	7/10	Bioinformatics for Immunology [3,4,8,9,10,12]
		7/12	PCA for Immunology [11,13]
7/17 – 7/20	12 The Immune System Gone Wrong 13 Immunodeficiency 14 Vaccines 15 Cancer and the Immune System	7/17	Graduate Student Presentation [17]
		7/19	Lab Exam (100 points) = closed notebook (20 pts) + computer-based (80 pts)
7/24 – 7/25	EXAM 2 (100 points) 7/24 16 Immunotherapy	7/24	No Lab
7/26	Open-Notebook Final Exam (12:45 - 2:45pm) (300 points) at 2202		

June 9	Registration for Summer II & III ends (11:59pm)
June 13-15	Attendance Verification for Summer II & III courses
June 15	Attendance Verifications due at 9am for Summer II & III
July 3	Midterm/Withdrawal Deadline for Summer II
July 26-27	Final Exam Days for Summer II
July 26-July 31	ALL Grades for Summer 2023 are due at 11am July 31st

References (Partial):

1. <https://www.wolfram.com/wolfram-u/catalog/gen005/>
2. <https://pubmed.ncbi.nlm.nih.gov/19564042/>
3. <https://www.ncbi.nlm.nih.gov/books/NBK6294/>
4. <https://www.immport.org/resources/cytokineRegistry>
5. <https://www.sciencedirect.com/science/article/pii/S0021925819887677?via%3Dihub>
6. <https://www.sciencedirect.com/science/article/pii/S004268220600290X>
7. <https://www.nature.com/articles/s41598-021-88630-9#Tab1>
8. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5763123/>
9. <https://services.healthtech.dtu.dk/services/NetMHCpan-4.1/>
10. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7738742/>
11. <https://pubmed.ncbi.nlm.nih.gov/21674720/>
12. <http://tools.iedb.org/main/>
13. <https://www.embopress.org/doi/full/10.15252/embr.202256214>
14. <https://elifesciences.org/articles/81646#s3>
15. <https://pubs.acs.org/doi/10.1021/acscami.3c06460>
16. <https://pubs.rsc.org/en/content/articlelanding/2023/CP/D3CP00425B>
17. <https://www.sciencedirect.com/science/article/pii/S0161589023000494>

Miscellaneous

1. <https://www.sciencedirect.com/science/article/pii/S2589004223005849?via%3Dihub>
2. <https://www.npr.org/sections/health-shots/2023/05/30/1178433166/theresa-macphail-allergic-allergies>

8. Classroom Policies

- Attendance and tardiness: Any absence policy should conform to the university policy. University Attendance Policy from the VSU catalogue:
“The University expects that all students shall regularly attend all scheduled class meetings held for instruction or examination. When students are to be absent from class, they should immediately contact the instructor. **A student who misses more than 20% of the scheduled classes of a course will be subject to receive a failing grade in the course.**”
- Lab Conduct: Arrive on time. Students who miss two labs without an excuse or three labs total cannot receive a lab grade above a “D”. So, do not be late to lab. In the event that a student misses a lab with an excuse, s/he should email the instructor within 24 hours of the missed lab. It is the instructor’s prerogative to accept the excuse or not. Absolutely no laboratories can be made up, and no work will be accepted late.
- Accommodations Statement:
Students with disabilities who are experiencing barriers in this course may contact the Access Office (<https://www.valdosta.edu/student/disability/>) for assistance in determining and implementing reasonable accommodations. The Access Office is located in University Center Room 4136 Entrance 5. The phone numbers are 229-245-2498 (V), 229-375-5871. For more

information, please visit VSU's Access Office or email: access@valdosta.edu. To request reasonable accommodations for pregnancy and childbirth, contact Christina Kidd, Student Conduct Coordinator at chkidd@valdosta.edu. Please note, you will be required to provide documentation from an appropriately licensed medical professional indicating the requested accommodations are medically necessary.

- Academic Integrity: You know that cheating is a bad thing to do. Students caught cheating will receive a grade of F for the test in question and will be reported to the Dean of Students. You are expected to follow VSU's Academic Integrity Code. From VSU's Academic Integrity Code (the full code is available at <http://www.valdosta.edu/academic/AcademicHonestyPoliciesandProcedures.shtml>) "Academic integrity is the responsibility of all VSU faculty and students. Faculty members should promote academic integrity by including clear instruction on the components of academic integrity and clearly defining the penalties for cheating and plagiarism in their course syllabi. Students are responsible for knowing and abiding by the Academic Integrity Policy as set forth in the Student Code of Conduct and the faculty members' syllabi. All students are expected to do their own work and to uphold a high standard of academic ethics. "
- Classroom demeanor or conduct: Every student should make the lecture a comfortable and enjoyable learning experience. Late entry to the class room or leaving early is bad behavior. Common sense should be practiced and expected.
- Communication: All VSU-related correspondence should be conducted via VSU email addresses for both student and instructor and via the Blazeview.
- **Title IX Statement**
- Valdosta State University (VSU) upholds all applicable laws and policies regarding discrimination on the basis of race, color, sex (including sexual harassment and pregnancy), sexual orientation, gender identity or expression, national origin, religion, age, veteran status, political affiliation, or disability. The University prohibits specific forms of behavior that violate Title IX of the Education Amendments of 1972. Title IX of the Education Amendments of 1972 prohibits discrimination on the basis of sex in education programs and activities that receive federal funding. VSU considers sex discrimination in any form to be a serious offense. Title IX refers to all forms of sex discrimination committed against others, including but not limited to: sexual harassment, sexual assault, sexual misconduct, and sexual violence by other employees, students or third parties and gender inequity or unfair treatment based on an individual's sex/gender. The designated Title IX Coordinator for VSU is Mr. Darius Thomas. To view the full policy or to report an incident visit: <https://www.valdosta.edu/administration/student-affairs/title-ix/>

9. Additional Information

- Expectations for competencies such as writing, technology skills, or performance: Students should be able to describe immunological phenomena at the molecular or cellular levels in terms of physics and chemistry.
- Instructional philosophy: I believe reading one book ten times is better than reading ten books one time. This is the case for this course.
- Strategies used to support learning: Students should take advantage of my office hours. Studying as a group (study group) should be a good idea.
- ***I will teach and you will learn immunology in this course. Therefore, your intellectual enhancement from this course will depend on both of us. Would you have any other ideas?***