

## Course Syllabus – IMS 430

### Course Information

Course Number: IMS 430 FA24  
Course Name: Principles of Immunology  
Term: Fall 2024  
Start Date: 09/03/2024  
End Date: 12/06/2024  
Credits: 3.0

### Meeting Days / Times

Tuesdays and Thursdays, 10:00-11:00am PT / 1:00-2:00pm ET  
Fridays, 11:15am-12:15pm PT / 2:15-3:15pm ET  
(See Calendar in Canvas for the most up-to-date schedule.)

### Location

CA: Graduate Office Dining Room, Hazen Theory Building  
FL: C304

### Course Managers

Role	Last Name	First Name	Email Address
Course Director	Teyton	Luc	<a href="mailto:lteyton@scripps.edu">lteyton@scripps.edu</a>
Course Director	Voss	James	<a href="mailto:jvoss@scripps.edu">jvoss@scripps.edu</a>
TA	Briggs	Skyler	<a href="mailto:skbriggs@scripps.edu">skbriggs@scripps.edu</a>
TA	Harris	Morgan	<a href="mailto:moharris@scripps.edu">moharris@scripps.edu</a>

### Course Description

Immunology is the study of the immune system, a complex organ that defends organisms against diseases and microbes. In its first part, the course is designed to provide an overview of basic concepts in the field of immunology, while particular contemporary topics will be addressed in its second part. The emphasis will be in discussing basic concepts, as well as their applications. The course will be tailored to accommodate students from all Scripps Research graduate study "tracks." Students who have never taken an immunology course may find *Principles of Immunology* to be useful as a first step for *Virology* and *Microbiology* elective courses, although this course is not a prerequisite for either course.

## **Program Learning Outcomes**

By the end of the program, students will have accomplished these objectives:

PLO1: Original Research – graduate students are expected to develop the skills critical for generating high-quality research output. This would include absorbing, recalling, and contextualizing scientific knowledge, evaluating scientific information and data, creating testable hypotheses and investigating hypotheses, mastering scientific tools and techniques, displaying ethical behavior, and receiving and giving feedback.

PLO2: Communication – graduate students are expected to demonstrate the oral, written, and media skills to effectively communicate the impact of a study or a body of work to the greater scientific community and to the public at large using a number of methods.

PLO3: Critical Thinking – graduate students are expected to develop a self-directed process to analyze information, form opinions or judgments, and use this process to improve the quality of their scientific thoughts, navigate problems, and make informed decisions.

PLO4: Intellectual Curiosity – graduate students are expected to acquire the capacity to build their intellectual curiosity and demonstrate problem solving approaches that serve their professional growth and ability to impact a field.

PLO5: Career and Professional Development – graduate students are expected to develop a variety of transferable skillsets throughout their graduate experience, including management and leadership, inclusiveness, resilience, scientific rigor, collaboration, accountability, time management, teamwork, networking, and career planning.

For a detailed description of each outcome and specific success indicators, please refer to this web page: <https://education.scripps.edu/graduate/doctoral-program/>.

## **Course Learning Outcomes**

By the end of this course, students will be able to:

CLO1: To have an understanding of the basic principles of immunity as an organ system.

CLO2: To solve experimental problems by making use of the learned basic concepts and experimental procedures.

CLO3: To appreciate the basic immunological mechanisms underlying some therapeutics used to treat immune and infectious diseases.

CLO4: To learn the basic characteristics of the relationship between the immune system and self and non-self.

CLO5: To appreciate the differences between homeostasis, healthy defense, and disease.

## **Background Preparation (Prerequisites)**

Most students will have taken Cell Biology and Molecular Biology (or the equivalents) as an undergraduate, but this is not required. Chemistry students are welcome.

## **Expectations and Logistics**

1) *Class Format*: The class will be a lecture format complemented by paper presentations and discussions (midterm and advanced topics).

2) *Class Preparation*: More basic background may be obtained by reading relevant sections of the textbook.

3) *Attendance and participation*: Attendance is mandatory. TAs will keep track of class participation, which will include asking questions, answering questions, and contributing to class discussion. Participation through any of these activities will be sufficient to achieve one unit. For full credit, students will accumulate 20 participation units.

4) *Midterm and final exams*: A list of papers selected by the lecturers will be provided in early November, and students will select one to present during midterm week. Student will prepare short presentations (approx. 10-15 minutes). Students will be assigned to presentation slots. An additional presentation will be integrated in the Advanced Topics part of the course and serve as the final.

## **Course Materials**

**Required:** Murphy & Weaver (2022). *Janeway's Immunobiology*, Tenth Edition. ISBN: 978-0393884890.

## **Course Requirements**

Grades will be based on the following:

- 20% class attendance and participation. Supports all five course learning outcomes, involves active learning, and allows assessment of mastery of course material.
- 40% midterm exam. Students will prepare approximately 10-15 minutes presentations about classic relevant papers in the fields of immunology. Students will select papers from a collection provided by the lecturers. Presentation of the paper will be followed by a discussion where the students will address questions from the class and course directors. Supports all five course learning outcomes and involves active learning.
- 40% final exam. Students will prepare approximately 10-15 minutes presentations about classic relevant papers in the fields of immunology. Students will select papers from a collection provided by the lecturers. Presentation of the paper will be followed by a discussion where the students will address questions from the class and course directors. Supports all five course learning outcomes and involves active learning.

## **Attendance Statement**

Students are expected to attend all classes. Students who are unable to attend class must seek permission for an excused absence from the course director or teaching assistant. Unapproved absences or late attendance for three or more classes may result in a lower grade or an “incomplete” for the course. If a student has to miss a class, he or she should arrange to get notes from a fellow student and is strongly encouraged to meet with the teaching assistant to obtain the missed material.

## **Scientific and Professional Ethics**

The work you do in this course must be your own. Feel free to build on, react to, criticize, and analyze the ideas of others but, when you do, make it known whose ideas you are working with. You must explicitly acknowledge when your work builds on someone else's ideas, including ideas of classmates, professors, and authors you read. If you ever have questions about drawing the line between others'

work and your own, ask the course professor who will give you clear guidance. Exams must be completed independently. Any collaboration on answers to exams, unless expressly permitted, may result in an automatic failing grade and possible expulsion from the Graduate Program.

### Technology Requirements and Support

For issues related to Canvas, please contact the Graduate Office by email at: [gradprgm@scripps.edu](mailto:gradprgm@scripps.edu) or by phone at: 858-784-8469.

### Course Grading

Grading is in accordance with the academic policies of the Skaggs Graduate School. The breakdown of grading is as follows:

- Class Attendance and Participation: 20%
- Midterm Exam: 40%
- Final Exam: 40%

Grade Point	Letter Grade	
4.00	A	Outstanding achievement. Student performance demonstrates full command of the course subject matter and evinces a high level of originality and/or creativity that far surpasses course expectations.
3.67	A-	Excellent achievement. Student performance demonstrates thorough knowledge of the course subject matter and exceeds course expectations by completing all requirements in a superior manner.
3.33	B+	Very good work. Student performance demonstrates above-average comprehension of the course subject matter and exceeds course expectations on all tasks as defined in the course syllabus. There is notable insight and originality.
3.00	B	Satisfactory work. Student performance meets designated course expectations and demonstrates understanding of the course subject matter at an acceptable level.
2.67	B-	Marginal work. Student performance demonstrates incomplete understanding of course subject matter. There is limited perception and originality.
2.33	C+	Unsatisfactory work. Student performance demonstrates incomplete and inadequate understanding of course subject matter. There is severely limited or no perception or originality. Course will not count toward degree.
2.00	C	Unsatisfactory work. Student performance demonstrates incomplete and inadequate understanding of course subject matter. There is severely limited or no perception or originality. Course will not count toward degree.
0.00	I	Incomplete is assigned when work is of passing quality but is incomplete for a pre-approved reason. Once an incomplete grade is assigned, it remains on student's permanent record until a grade is awarded.
0.00	P	Satisfactory work. Student performance demonstrated complete and adequate understanding of course subject matter. Course will count toward degree.

0.00	F	Unacceptable work/Failure. Student performance is unacceptably low level of knowledge and understanding of course subject matter. Course will not count toward degree. Student may continue in program only with permission of the Dean.
0.00	W	Withdrew from the course with Dean's permission beyond the second week of the term.

- All courses will be recorded and maintained in the student's permanent academic record; only courses that apply towards the degree will appear on the academic transcript. Non-credit or audited courses will not appear on the transcript.
- 4 core courses taken for a letter grade (pass = B- or higher for a core course)
- 2 elective courses taken pass/fail (pass = A, B, C for an elective)

Because students are encouraged to take electives outside their area of expertise, a "C" letter grade is passing.

### Course Summary

Date	Details
Mon Sep 2, 2024	Labor Day (No Class)
Tue Sep 3, 2024	History of Immunology (Teyton)
Thu Sep 5, 2024	Molecular and cellular bases of innate immunity (Teyton)
Fri Sep 6, 2024	Grad Student Symposium (No Class)
Tue Sep 10, 2024	Coagulation, complement, phagocytosis (Teyton)
Thu Sep 12, 2024	General Principles of Immunology (Nemazee)
Fri Sep 13, 2024	Adaptive immunity (Voss/Bhange)
Tue Sep 17, 2024	Humoral Immunity (Zwick)
Thu Sep 19, 2024	Cellular immunity (Nemazee)
Fri Sep 20, 2024	Midterm presentations
Tue Sep 24, 2024	Midterm presentations
Thu Sep 26, 2024	Midterm presentations
Fri Sep 27, 2024	BCR, TCR structures and Engineering (Jardine)
Tue Oct 1, 2024	TLRs, NFkB, JAK/STAT, inflammasome (Nemazee)
Thu Oct 3, 2024	TLRs, NFkB, JAK/STAT, inflammasome-Continued (Nemazee)
Fri Oct 4, 2024	Antibody and antigen receptor signaling, V(D)J recombination, B cell development (Nemazee)
Tue Oct 8, 2024	Antibody and antigen receptor signaling, V(D)J recombination, B cell development-Continued (Nemazee)
Thu Oct 10, 2024	Antigen presentation/ MHC (Teyton)
Fri Oct 11, 2024	Antibody class switch/SHM (Nemazee)
Tue Oct 15, 2024	Antigen presentation/ MHC-Continued (Teyton)
Thu Oct 17, 2024	TCR signaling/ T cell development (Solt/ Pipkin)
Fri Oct 18, 2024	TCR signaling/ T cell development-Continued (Solt/ Pipkin)
Tue Oct 22, 2024	CD8 T priming, costim, cross-presentation, memory (Pipkin)
Thu Oct 24, 2024	CD4 T priming, costim, cross-presentation, memory (Tejaro)
Fri Oct 25, 2024	T cell mediated immunity to infection/ cytokines/ polarizaiton (Tejaro)
Tue Oct 29, 2024	Innate lymphocytes/ barrier immunity (Constantinides)
Thu Oct 31, 2024	Innate lymphocytes/ barrier immunity-Continued (Constantinides)

Fri Nov 1, 2024	Tolerance/ autoimmunity (Nemazee)
Tue Nov 5, 2024	Tolerance/ autoimmunity-Continued (Nemazee)
Thu Nov 7, 2024	Experimental approaches in immunology (Zwick)
Fri Nov 8, 2024	Bacteria Host interactions (Hang)
Tue Nov 12, 2024	Neuro-Immune interactions (Mendoza)
Thu Nov 14, 2024	Final Presentations
Fri Nov 15, 2024	Final Presentations
Tue Nov 19, 2024	Final Presentations
Thu Nov 28, 2024	Thanksgiving Holiday (No Class)
Fri Nov 29, 2024	Thanksgiving Holiday (No Class)