**Course Syllabus – IMS 420**

**Course Information**

Course Number: IMS 420 FA20
Course Name: Introduction to Immunology and Microbial Sciences
Term: Fall 2020
Start Date: 09/8/2020
End Date: 12/11/2020
Credits: 3.0

**Meeting Days / Times**

Tuesdays and Thursdays, 10:00-11:00am PT / 1:00-2:00pm ET
Fridays, 8:15-9:15am PT / 11:15am-12:15pm ET
(See Calendar in Canvas for the most up-to-date schedule.)

**Location**

Online via Zoom

**Course Managers**

| Role | Last Name | First Name | Email Address |
|---|---|---|---|
| Course Director | de la Torre | Juan | juanct@scripps.edu |
| Course Director | Teyton | Luc | lteyton@scripps.edu |
| TA | Moore | Nina | nmoore@scripps.edu |

**Course Description**

Immunology is the study of the immune system, a complex organ that defends organisms against diseases and microbes. The course is designed to provide an overview of basic concepts in the field of immunology and microbiology and the interaction between pathogens and the host immune response to infection. 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 "Introduction to Immunology and Microbial Sciences" to be useful as a first step for the more in-depth "Immunology" and "Virology" 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: Published research story.
PLO2: Generate creative approaches and methodologies for complex scientific questions.
PLO3: Master a potent set of technical research skills.
PLO4: Possess strong communication skills.

**Course Learning Outcomes**

By the end of this course, students will be able to:
CLO1: To have an understanding of the basic principles of immunology and microbiology.
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 course (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, except for "hands on" flow cytometry demonstration.

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 finals week. Student will prepare short presentations (approx. 10-15 minutes). Students will be assigned to presentation slots.

**Course Materials**

Required: Parham (2014). *The immune system, 4th edition*. ISBN: 978-0815344667.
Required: Norkin (2009). *Virology: Molecular biology and pathogenesis*. ISBN: 978-1555814533.

**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 and microbiology. 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 and microbiology. 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 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 Schedule:**

| Date | Details |
|---|---|
| Mon Sep 7, 2020 | Labor Day (No Class) |
| Tue Sep 8, 2020 | Overview of innate immunity (Baccala) |
| Thu Sep 10, 2020 | Overview of adaptive immunity (Sullivan) |
| Fri Sep 11, 2020 | Graduate Student Symposium (No Class) |
| Tue Sep 15, 2020 | Antigen presentation (Teyton) |
| Thu Sep 17, 2020 | Immunity at the epithelial and mucosal surface (Howard Hang) |
| Fri Sep 18, 2020 | Visualization of the immune system (Henderson) |
| Tue Sep 22, 2020 | Antibodies: functions and applications (Nemazee) |
| Thu Sep 24, 2020 | Immune tolerance (Nemazee) |
| Fri Sep 25, 2020 | Autoimmunity (Kono) |
| Tue Sep 29, 2020 | Immune deficiencies and their treatment (Teyton) |
| Thu Oct 1, 2020 | Immune therapy (Pipkin) |
| Fri Oct 2, 2020 | The microbiome (Wolan) |
| Tue Oct 6, 2020 | Mouse vs. human immunology (Paust) |
| Thu Oct 8, 2020 | Midterm presentations |
| Fri Oct 9, 2020 | Midterm presentations |
| Tue Oct 13, 2020 | Midterm presentations |
| Thu Oct 15, 2020 | Flow cytometry (Saluk) |
| Fri Oct 16, 2020 | Biophysical measuremens in immunology (Zwick) |
| Tue Oct 20, 2020 | Statistics and reproducibility in the field of immunology (Crynen) |
| Thu Oct 22, 2020 | Stem cells and iPS cells in immunology and infectious diseases (Janiszewska) |
| Fri Oct 23, 2020 | Chemical approaches to immunology and microbiology (Teijaro) |
| Tue Oct 27, 2020 | Principles of virology (de la Torre) |
| Thu Oct 29, 2020 | Viral vectors: Concepts and applications (Nemerow) |
| Fri Oct 30, 2020 | The host immune response to infection (Teijaro) |
| Tue Nov 3, 2020 | Structural biology to understand pathogens (Ward) |
| Thu Nov 5, 2020 | Viral pathogenesis (de la Torre) |
| Fri Nov 6, 2020 | Glyco-Immunology (Paulson) |
| Tue Nov 10, 2020 | Vaccines (Law) |
| Thu Nov 12, 2020 | Genomics in immunology and microbiology (Pauthner) |
| Fri Nov 13, 2020 | Drug discovery in immunology and microbiology (Lairson) |
| Tue Nov 17, 2020 | Final Presentations |
| Thu Nov 19, 2020 | Final Presentations |
| Thu Nov 26, 2020 | Thanksgiving Holiday (No Class) |
| Fri Nov 27, 2020 | Thanksgiving Holiday (No Class) |