

# IMMUNOLOGY (IMUN)

---

## IMUN 5060 Immune Mechanisms

This is an introductory graduate course which surveys most areas of immunology. It is assumed that students have a background in biochemistry and molecular biology, and at least some familiarity with immunological concepts. Topics covered include the major histocompatibility complex, structure of antibodies and T cell receptors, antigen-antibody interactions, the generation of diversity of immunoglobulins and B cells, antigen presentation, and immunological tolerance.

Fall

1 Course Unit

## IMUN 5070 Immunopathology

The relationship between basic immunology and clinical immunologic diseases is emphasized. Course lecturers represent University faculty who are established investigators in immunological research and established clinical immunologists. Course topics include plasma protein systems; B cell, T cell, macrophage immunology; immunohematology; tumor immunology; benign and malignant, immunoproliferative disorders; neuro-immunology; pulmonary immunology; renal immunology; immune complex disease and immunoregulatory abnormalities. Prerequisite: Permission from instructor.

Fall

Prerequisite: IMUN 5060

1 Course Unit

## IMUN 5200 Tutorials in Immunology

This tutorial course is designed to provide students with an in-depth knowledge of a specific branch of Immunology. The tutorial can be used to enable students to become more deeply acquainted with the literature related to their thesis projects or to expand on a topic that the student found interesting in one of their basic courses. The course is currently the only immunology elective and is, therefore, required for all Immunology Graduate Group students. It is also open as an elective to BGS students who meet the prerequisite. The tutorial course will be examined by the program director and the tutorial leader and the grade will be based on a written paper on the subject studied (5 to 10 typewritten pages) and by an oral presentation of the paper (15 to 20 minutes). Prerequisite: A senior undergraduate, graduate or professional school course in Immunology.

Fall

1 Course Unit

## IMUN 5770 Statistics for Genomics and Biomedical Informatics

BMIN 5330 is an introductory course in probability theory and statistical inference for graduate students in Genomics and Computational Biology. The goal of the course is to provide foundation of basic concepts and tools as well as hands-on practice in their application to problems in genomics. At the completion of the course, students should have an intuitive understanding of basic probability and statistical inference and be prepared to select and execute appropriate statistical approaches in their future research.

Also Offered As: BMIN 5330, GCB 5330

1 Course Unit

## IMUN 6010 Molecular Immunology

The purpose of this course is to provide examples in which the cell biology topics covered in BIOM 600 are studied in the context of immune cells or used to explain immune system function. This course will help students become proficient at reading and critically assessing the published literature and encourage students to actively participate in scientific discussion with their peers.

Not Offered Every Year

0.5 Course Units

## IMUN 6070 Grant Writing

This course will introduce the student to basic principles of grant writing. In this regard a primary objective of the course is to teach you how to describe your ideas and experimental objectives in a clear and concise manner within the standard NIH grant format. To accomplish this, you will be required to write an NIH, "RO1" type grant proposal based on your current laboratory project. Prerequisite: Permission from instructor.

Spring

Prerequisite: IMUN 5060 AND IMUN 5070

1 Course Unit

## IMUN 6090 Vaccines and Immune Therapeutics

Vaccination is perhaps the most successful medical technological intervention. The goal of this course is to expand on students' general understanding of the immune system and to focus this understanding towards the application of modern vaccines and immune therapies in the 21st century. The course will provide the student with a sense of how these principles are applied to a vaccine and immune therapeutic development. The course covers basic vaccine science and describes how this science is translated through clinical, regulatory, ethical, and political issues to result in a final vaccine product. The courses' goal is to leave the student with an understanding of the implications of modern vaccines /immunotherapies and their impact on world health. Initial lectures review immune mechanisms believed to be responsible for vaccine-induced protection from disease. Subsequent lectures build on this background to explore the science of vaccines for diverse pathogens, including agents of bioterrorism, as well as vaccines and immunotherapies for cancer. An appreciation for the application of laboratory science to the clinical development and clinical trials of vaccines are provided. An important focus on the regulatory, safety, and ethical implications of vaccines in different world situations based on true world examples are presented. The financial implications of specific vaccines with these implications for global health is a focus of the course. The course is presented in a lecture-style consisting of multiple distinguished guest lecturers who are experts in their particular area of vaccine development. There are required readings to provide the student context and background for the diverse lectures. Students are graded on course participation and a final project/exam which the students will present. The project is to design a vaccine strategy for a current disease or pathogen of importance that does not as yet have an effective vaccine or immune therapy and present this to the class. Strategies used should build on the material presented in the class lectures. The course is intended for graduate students or medical students in various MS, Ph.D., or MD/Ph.D. programs on the campus, as well as local scientists and professionals in the community. As a prerequisite, students should have taken biology, biochemistry, or immunology courses at the advanced college level. This course is offered in the fall semester. Prerequisite: Biology, Biochemistry at the advanced college level, college-level immunology is recommended. Not limited to CAMB students, however first options are to CAMB students, the permission of the

Fall

Also Offered As: CAMB 6090

1 Course Unit

**IMUN 6990 Laboratory Rotation**

Lab rotation.

0-4 Course Units

**IMUN 7990 Independent Study**

1-3 Course Units

**IMUN 8990 Predissertation Lab**

1-4 Course Units

**IMUN 9950 Dissertation**

Ph.D. students enroll in this course after passing their candidacy exam. They work on their dissertation full-time under the guidance of their dissertation supervisor and other members of their dissertation committee.

0 Course Units