IMMUNOLOGY (IMUN)

IMUN 506 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. There will be two exams, both of which will require assessment and interpretation of experimental data and/or readings from the primary literature. Prerequisite: Permission of instructor.
Taught by: Michael May
Course usually offered in fall term
Activity: Lecture
1.0 Course Unit

IMUN 507 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.
Taught by: Michael May and Erica Stone
Course usually offered in fall term
Prerequisite: IMUN 506
Activity: Lecture
1.0 Course Unit

IMUN 520 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.
Taught by: Randy Cron, M.D., Ph.D.
Course usually offered in fall term
Activity: Seminar
1.0 Course Unit

IMUN 577 Advanced Epigenetics Technology
Second year students in GCB, CAMB (G&E), or IGG programs using genomics methods to measure transcriptomics and epigenomics changes in their experimental systems. The goal is to familiarize students with the latest cutting-edge genomics tools and cover solutions to major experimental and computational challenges in the investigation of genome-wide epigenetic data sets. Students will develop competence in (i) variations of experimental techniques improving resolution and throughout, (ii) issues related to the computational analyses closely related to the various genome-wide assays used to probe epigenetic processes and signals, (iii) computational approaches useful to overcome pitfalls associated to the analysis of a given epigenetic data modality, (iv) methods, techniques and studies on the integration of multi-layer epigenetic data sets.
Taught by: Golnaz Vahedi
Course usually offered in spring term
Also Offered As: CAMB 577, GCB 577
Prerequisite: (BIOL 483 OR BIOL 493) AND GCB 534 AND (GCB 535 OR GCB 536)
Activity: Lecture
1.0 Course Unit

IMUN 601 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.
Taught by: Drs. Paula Oliver and Jan Burkhardt
Course not offered every year
Activity: Lecture
0.5 Course Units

IMUN 607 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.
Taught by: Andrew Wells, Bruce Freedman, Michael Cancro
Course usually offered in spring term
Prerequisite: IMUN 506 AND IMUN 507
Activity: Seminar
1.0 Course Unit
**IMUN 609 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 instructors via email.

Taught by: David Weiner, Paul Offit, Stanley Plotkin

Course usually offered in fall term

Also Offered As: CAMB 609

Activity: Lecture

1.0 Course Unit

**IMUN 699 Laboratory Rotation**

Laboratory research conducted under a faculty advisor. Three different rotations covering usually the fall semester of the first year through the fall semester of the second year are required of all Immunology Ph.D. students. Students will defend the rotation research in their Preliminary Exams. Prerequisite: Permission of instructor and immunology chair.

Taught by: Immunology Graduate Group Faculty

One-term course offered either term

Activity: Laboratory

1.0 Course Unit

**IMUN 799 Independent Study**

Activity: Independent Study

1.0 Course Unit

**IMUN 899 Pre-Dissertation Lab**

Activity: Laboratory

1.0 Course Unit

**IMUN 995 Dissertation**

Activity: Dissertation

1.0 Course Unit