MAYO IMMUNOLOGY COURSES, 2017

Immunology overview courses:

CORE6200 Basic Graduate Immunology.  3 Cr.
- Fall quarter Oct-Dec each year; 9-11 am Tues & Thurs
- Dr. Karen Hedin, course director. Team taught by multiple IMM faculty/clinicians. Upper level IMM PhD students serve as Assistant Instructor and Tutors.
- An MGS CORE course for first year graduate students; required for IMM track PhD students. MD/PhD students have the option to waive this course or many choose to audit it. Also taken by medical residents & fellows, and PhD students from other tracks.
- A comprehensive overview of immunology, including both basic research, clinical immunology and pathology, transplant, and cancer immune therapies including cancer vaccines. An optional immunology research methods workshop is also offered in conjunction with the course (three additional two hr sessions—see schedule).
- Required reading is the textbook "Immunobiology" by Janeway (Garland, 9th edition).
- Qualified IMM PhD students can gain teaching experience tutoring and designing and leading the methods workshops- contact Dr. Hedin.
- Free individual tutoring available; tutors run review sessions before each exam.
- Assessment: 3 open book exams, daily quizzes.

MMS Block 5; 34 contact hours.
- Dr. Anne Novak, course director
- Mayo Clinic School of Medicine basic immunology and immunopathology course
- Overview of immunology; shorter & less comprehensive than CORE6200.
- ***please note- only enrolled medical students can attend at present.

Immunology recommended course:

CORE6050 Critical Thinking and Scientific Writing. 2 Cr.
- Spring quarter each year; 1-2pm Monday & Wednesdays; Gugg 1598
- Dr. Karen Hedin and Dr. Allan Bieber, course directors. Team taught with Drs. Johnson, Schrum, Horazdovsky, Maher, and others.
- For PhD students from all tracks, fellows, and any others who are interested in learning how to write a grant on either a current research project or an idea from the literature.
- Students registered for credit must write a grant in the course and participate in all class sessions.
- Focuses on teaching students scientific thinking, experimental design, and effective, clear communication of scientific results. Research project design and the development of each students’ individual developing research project is a major activity in this course.
- Assessment: pass/fail based on writing a grant, thoughtfully reviewing the grants of other students, and attendance.
Immunology journal clubs:

**IMM6863 Current Topics in Immunology J Club (“CTI”). 1 Cr.**
- Fall, Winter, Spring quarter each year; 4-5pm Tues; Gugg 2 Goldstein Hall
- Dr. Haidong Dong, course director.
- Students present & discuss current literature on important areas of immunology.
- Some sessions are Work in Progress presentations by students of their current research in immunology.
- If you are registering to take the course for credit, please contact the course director 1 quarter in advance to arrange your presentation date.
- Contact Terri Felmlee to be put on the mailing list
- Assessment: pass/fail

**IMM6862 Current Topics in Cell Activation and Signaling J Club. 1 Cr.**
- Winter, & Spring quarters each year; 11am-noon Fridays; Gugg 598
- Dr. Karen Hedin (winter) and Dr. Dan Billadeau (spring), course directors.
- Students present & discuss current literature on important topics and techniques in signal transduction and molecular investigation, not necessarily only immunology signaling—all areas of signal transduction.
- If you are registering to take this course for credit, please contact the course directors a few weeks in advance to arrange your presentation date.
- Contact Terri Felmlee to be put on the mailing list
- Assessment: pass/fail

**IMM6867 Current Topics in Clinical & Translational Immunology J Club. 1 Cr.**
- Fall & Winter quarters each year; 12:15pm-1:15pm Mondays; Gugg 1093
- Dr. Hirohito Kita, course director.
- Students present & discuss current literature on all areas of clinical immunology including hypersensitivity, innate immunity, mucosal immunology, and mechanisms and treatment of immune-mediated diseases.
- If you are registering to take the course for credit, please contact the course director to arrange your presentation date.
- Contact Dr. Kita to be put on the mailing list
- Assessment: pass/fail
Immunology advanced courses/tutorials:
- Each course consists of 10 x 2 hr sessions. Sessions are taught 2-4 pm on Tues & Thursday in Gugg 598. Videoconferenced to Mayo Arizona and Mayo Florida.
- Each session combines lecture, the working of problem sets, and participatory discussion by all students each session of several assigned papers and review articles.
- Assessment: 1 closed book exam for each course, plus participation.

**Offered Winter/Spring 2017, 2019, etc:**

**IMM 6877 Tutorial in Molecular Basis of Immune Recognition. 2 Cr.**
- Advanced course on MHC Class I and II, and immunoglobulin and TCR, structure and function.
- Dr. Larry Pease, course director. Team taught with Drs. David, Rajagopalan, Taneja and Pavelko.
- Offered Winter quarter part A in alternate years 2017, 2019 etc

**IMM 6882 Tutorial in Mucosal Immunity. 2 Cr.**
- Advanced course on immunobiology of organ-specific immunity including mucosal immunity, by Natural Killer cells and organ-resident myeloid cells.
- Dr. Khash Khazaie, course director. Team taught with Dr. Faubion, Mangalam, and Murray.
- Offered Winter quarter part B in alternate years 2017, 2019 etc.

**IMM 6880 Tutorial in Immunopathology. 2 Cr.**
- Advanced course on the immunopathology of virus and bacterial infection, autoimmunity, tumor immunology, and transplantation.
- Dr. Michael Barry, course director. Team taught with Drs. Aaron Johnson, Cattaneo, and Parney.
- Offered Spring quarter part A in alternate years 2017, 2019 etc.

**Offered Winter/Spring 2018, 2020, etc:**

**IMM 6879 Tutorial in Cellular Activation/Signal Transduction. 2 Cr.**
- Advanced course on the intracellular signaling pathways that control cellular proliferation, metastasis/migration, and apoptosis.
- Dr. Karen Hedin, course director. Team taught with Drs. Billadeau, Medina, Shapiro, and Khazaie.
- Offered Winter quarter part A in alternate years 2018, 2020 etc.

**IMM 6884 Tutorial in Tumor Immunology. 2 Cr.**
- Advanced course covering the current clinical applications and basic research on tumor immunology and tumor immune therapy.
- Dr. Haidong Dong, course director. Team taught with Drs. Khazaie, Markovic, Pavelko, Parney, Knutson, and Vile.
- Offered Winter quarter part B in alternate years 2018, 2020 etc.

**IMM 6885 Tutorial in Generation and Function of B cells. 2 Cr.**
- Advanced course on the immunobiology of B-lymphocytes in health and disease, including the development of leukemias and lymphomas.
- Dr. Kay Medina, course director. Team taught with Drs. Jelinek, Novak, Shapiro, Taneja, and Abraham.
- pre-requisites: CORE6200 or MMS Block 5.
- Offered Spring quarter part A in alternate years 2018, 2020 etc.
Recommended additional courses for Immunology subtracks/areas of specialization:

- The Immunology PhD program offers students the choice of 4 well-developed subtracks (ie areas of specialization).
- For each subtrack below, students are invited to select 4 or more credits of elective coursework from the courses listed. These courses are chosen for their value in augmenting the foundations provided by the required immunology courses listed on the previous pages. For more information on each course, see the graduate school course catalogue.
- Alternatively, IMM students are invited to design their own area of specialization. Please discuss your elective course selections with your lab mentor and the IMM program director.

**IMM Subtrack 1 - Cancer Immunology and Immunotherapy**

- Core 6770 Virology and Gene Therapy 3 cr
- Core 6510 Molecular Mechanisms of Human Disease 3 cr
- BMB 5000 Introduction to Cancer Biology 3 cr
- BMB 6070 Cancer Biology II: Molecular Mechanisms 3 cr
- VGT 6510 Gene and Cell Therapy 2 cr
- BMB 6510 Cancer Biology Journal Club 1 cr

**IMM Subtrack 2 - Autoimmunity and Immune Mediated Diseases**

- Core 6510 Molecular Mechanisms of Human Disease 3 cr
- Core 6400 Molecular Genetics 3 cr
- BMB 6000 Biological Macromolecules 2 cr
- BMB 6350 Introductory Bioinformatics 2 cr
- CTSC 5600 Statistics in Clinical Research 2 cr

**IMM Subtrack 3 - Molecular Biology and Signaling in Immune Activation**

- Core 6250 Molecular Cell Biology 3 cr
- Core 6450 Molecular Pharmacology and Receptor Signaling 2 cr
- BMB 6650 Receptor Trafficking and Signaling 2 cr
- BMB 6675 Protein Structure and Dynamics 2 cr
- BMB 6660 Transcription, Chromatin, and Epigenetics 2 cr
- MPET 6812 Receptor Biology 2 cr
- BMB 6801 Concepts of Vesicular Trafficking Journal Club 1 cr

**IMM Subtrack 4 - Immune System Development and Regeneration**

- Core 6250 Molecular Cell Biology 3 cr
- Core 6050 Molecular Mechanisms of Human Disease 3 cr
- BMB 5400 Developmental Biology 2 cr
- BMB 6660 Transcription, Chromatin, and Epigenetics 2 cr
- BMEP 6700 Physiology from Cells to Organisms 6 cr
- MPET 6820 Regenerative Medicine 1 cr
- NBD 6855 Regenerative Medicine in Neurology 2 cr
- CTSC 6821 Regenerative Medicine Journal Club 1 cr