

2023-2024 MCB Area of Interest Course Information

Microbiology, Infection, & Immunity

Please check the University of Washington Time Schedule for the most updated course information.

FOUNDATIONAL COURSES

Note: This track is broadly divided into the related sub-tracks of immunology, virology, and bacteriology. The foundational courses include two courses focused on each sub-track, denoted as 1=Immunology, 2=Virology, and 3=Bacteriology. Interested students can focus on one sub-track or mix and match from these sub-tracks depending on their specific area of research. Area directors or more senior MCB students can discuss these sub-tracks with interested first-year students.

Foundational Course 1A:

Course Number: IMMUN 532

Course Title: Intersection of innate and adaptive immunity in disease (“Advanced Immunology”)

Instructor (s): Michael Gerner, Elia Tait-Wojno

Location: SLU

Credits: 4

Quarter, Weeks, and Frequency course is offered: Winter quarter, weeks 1-10, every year

Attributes: Graded, lecture based, extensive discussion of primary literature.

Sub Area (if applicable): Immunology

Synopsis: This is the primary graduate-level survey of immunology. Many lectures are given by guest lecturers from the Dept. of Immunology who are renowned experts in these topics.

Lectures are complemented by discussion and critique of relevant primary literature.

Prerequisite(s): Undergraduate immunology course (e.g. IMMUN 441), or equivalent.

Foundational Course 1B:

Course Number: IMMUN 537

Course Title: Immunological Methods

Instructor (s): Andrew Oberst, Mark Headley

Location (e.g., UW, FH, SLU): SLU

Credits: 1.5

Quarter, Weeks, and Frequency course is offered: Autumn quarter, weeks 6-10, every year

Attributes (e.g., graded, lecture-based): Graded, lecture based.

Synopsis: This course covers key methods required for immunological research.

Prerequisite(s): Undergraduate Immunology course (e.g. IMMUN 441), or equivalent.

Foundational Course 2A:

Course Number: MCB 532

Course Title: Human Pathogenic Viruses

Instructor (s): Michael Emerman

Location: FH

Credits: 3

Quarter, Weeks, and Frequency course is offered: Autumn, weeks 1-10, odd years, *will be offered in Autumn 2025*

Attributes: Graded, lecture based, extensive discussion of primary literature.

Sub Area (if applicable): Microbiology

Synopsis: Students will learn basic and advanced concepts in virology by focusing on major groups of human pathogenic viruses. The major emphasis will be on virus replication, evolution, and pathogenesis.

Foundational Course 2B:

Course Number: MICROM 540

Course Title: Virology

Instructor (s): Michael Lagunoff, Jason Smith, Jenny Hyde

Location: SLU

Credits: 3

Quarter, Weeks, and Frequency course is offered: Autumn, weeks 1-10, even years, *will be offered in Autumn 2024*

Attributes: Graded, lecture based, extensive discussion of primary literature.

Sub Area (if applicable): Microbiology

Synopsis: The molecular biology, transmission, and pathogenesis of human viruses will be explored. In addition to general principles of virology, lectures and paper discussions will focus on specific human pathogens including HIV, herpesviruses, ebolaviruses, alphaviruses, and adenoviruses, among others.

Foundational Course 3A:

Course Number: CONJ 558

Course Title: Prokaryotic Biology

Instructor (s): Harwood, Leigh

Location: UW

Credits: 3

Quarter, Weeks, and Frequency course is offered: Winter. ***Course not currently being offered***

Attributes: Graded, lecture based, extensive discussion of primary literature.

Sub Area (if applicable): Microbiology

Synopsis: Basic principles in prokaryotic cell structure, genomics, and metabolism. Introduction to prokaryotic physiology, bacterial pathogenesis, and microbial ecology.

Foundational Course 3B:

Course Number: MICROM 553

Course Title: Molecular Interactions of Bacteria with their hosts

Instructor (s): Josh Woodward, Joseph Mougous

Location: SLU

Credits: 3

Quarter, Weeks, and Frequency course is offered: Spring, weeks 1-10, odd years, *will be offered Spring 2025*

Attributes: Graded, lecture based, extensive discussion of primary literature.

Sub Area (if applicable): Microbiology

Synopsis: The processes bacteria employ to shape interactions with their hosts will be explored in molecular detail through selected examples in the literature.

ELECTIVE COURSES

Elective Course One:

Course Number: CONJ 518

Course Title: Molecular Biology and Immunology of HIV and AIDS

Instructor (s): TBD

Location: UW

Credits: 1.5

Quarter, Weeks, and Frequency course is offered: Spring. *Course not currently being offered*

Attributes:

Sub Area (if applicable): Virology

Synopsis: Intended for a broad array of science and public health majors. Will cover history of AIDS pandemic, and methodology and current progress in AIDS pathogenesis, vaccine development and cure research.

Elective Course Two:

Course Number: CONJ 539

Course Title: Modern Approaches to Vaccines

Instructor (s): Fuller

Location: SLU

Credits: 1.5

Quarter, Weeks, and Frequency course is offered: Spring. *Course not currently being offered*

Attributes: Lecture based, extensive use of primary literature

Sub Area (if applicable):

Synopsis: Covers selected topics based on recent publications in viral and bacterial vaccine research. Emphasizes understanding the latest advanced and issues in vaccine discovery, mechanisms of action, and special topics in viral vaccines.

Elective Course Three:

Course Number: CONJ 551

Course Title: Immunity

Instructor (s): TBD

Location: UW

Credits: 1.5

Quarter, Weeks, and Frequency course is offered: Spring. *Course not currently being offered*

Attributes:

Sub Area (if applicable): Immunology

Synopsis: Provides an understanding of the central cellular and molecular players in the mammalian immune system at a level appropriate for the non-specializing graduate student. Selected topics include the molecular basis of B and T cell activation and effector functions and the mechanisms of innate immunity.

Elective Course Four:

Course Number: CONJ 557

Course Title: Microbial Evolution

Instructor (s): TBD

Location: UW

Credits: 1.5

Quarter, Weeks, and Frequency course is offered: Autumn/Spring. *Course not currently being offered*

Prerequisite: MICROM 412 or general biology background

Attributes: Lecture based, extensive use of primary literature

Sub Area (if applicable): Microbiology

Synopsis: Selected topics in microbial evolution including evidence for early life on Earth, molecular mechanisms of bacterial and viral evolution, speciation, adaptive niche

differentiation, bioinformatics tools to detect selection, and evolution of the virulence and pandemic spread.

Elective Course Five:

Course Number: CONJ 562

Course Title: Advanced Topics in bacterial physiology

Instructor (s): TBD

Location: UW

Credits: 1.5

Quarter, Weeks, and Frequency course is offered: Spring. *Course not currently being offered*

Attributes:

Sub Area (if applicable): Microbiology

Synopsis: Covers cutting edge research and concepts pertaining to the complexity of the bacterial cell with an emphasis on primary literature and discussion.

Elective Course Six:

Course Number: GLOBAL HEALTH 566

Course Title: Biochemistry and Genetics of Pathogens and Their Hosts

Instructor (s): Andrew McGuire, Noah Sather

Location: UW

Credits: 4

Quarter, Weeks, and Frequency course is offered: Autumn, weeks 1-10, every year

Attributes: Lecture based, extensive use of primary literature

Sub Area (if applicable):

Synopsis: Provides a strong foundation in biochemistry, molecular biology, and genetics for students interested in disease. Principles illustrated through examples focusing on pathogens, and infectious and non-infectious disease.

Note: offered jointly with PABIO 551A.

Prerequisite(s): Undergraduate-level coursework in molecular biology or biochemistry, or permission of instructor.

Elective Course Seven:

Course Number: IMMUN 441

Course Title: Introduction to Immunology

Instructor (s): Jakob von Moltke

Location: UW

Credits: 4

Quarter, Weeks, and Frequency course is offered: Autumn, weeks 1-10, every year

Attributes: Lecture based

Sub Area (if applicable): Immunology

Synopsis: This is an undergraduate class that presents a complete introduction to immunology. MCB students interested in this topic who have not taken a basic immunology course are encouraged to take or audit this course in preparation for more advanced immunology courses. Students must obtain approval from the MCB Co-Directors for this 400-level class to count toward their 18-graded credits.

Prerequisite(s): BIOL 220

Elective Course Eight:

Course Number: IMMUN 538

Course Title: Immunological Based Diseases and Treatments

Instructor (s): Ram Savan, Estelle Bettelli

Location: SLU

Credits: 2

Quarter, Weeks, and Frequency course is offered: Spring. *Course not currently being offered*

Attributes: Lecture based, extensive use of primary literature

Sub Area (if applicable): Immunology

Synopsis: This course focuses on the role of the immune system in both causing and resolving disease. Topics include autoimmune disease, infection, and cancer immunology. Each class includes both a lecture component and a discussion of relevant primary literature.

Elective Course Nine:

Course Number: PABIO 552

Course Title: Cell Biology of Human Pathogens and Disease

Instructor (s): Hybiske, Grundner

Location: UW

Credits: 4

Quarter, Weeks, and Frequency course is offered: Winter, weeks 1-10. *Course not currently being offered.*

Attributes: Lecture based, extensive use of primary literature

Sub Area (if applicable):

Synopsis: Cell biology and immunology explored through diseases of public health importance. Examples of pathogen interaction with host cell biology and immune systems, unique aspects of the cell biology of pathogens, perturbations of these systems in non-infectious diseases, and design of therapeutics and vaccines to combat diseases of public health importance.

Prerequisite(s): Undergraduate-level coursework in biology or molecular biology or permission of instructor.