2021-2022 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 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, weeks 6-10, T-Th 11-12:30, every year
Attributes (e.g., graded, lecture-based): Graded, lecture based. **Prerequisite**: Undergraduate Immunology course (e.g. IMMUN 441), or equivalent.
Synopsis: This course covers key methods required for immunological research.

Foundational Course 1B:

Course Number: IMMUN 534
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, every year
Attributes: Graded, lecture based, extensive discussion of primary literature. **Prerequisite:** Undergraduate immunology course (e.g. IMMUN 441), or equivalent.
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.

Foundational Course 2A:

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, even years
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 2B:

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, odd years
Attributes: Graded, lecture based, extensive discussion of primary literature.
Sub Area (if applicable): Microbiology
Synopsis: Replication, regulation, and pathogenesis of several groups of human viruses, including human immunodeficiency virus and papillomaviruses. Emphasis on the unique aspects of the viral-like cycles as they relate to effects on infected cells and organisms. Guest lecturers focus on viral immunology, measles. herpes simplex virus, and HHV-8

Foundational Course 3A:

Course Number: Microm 553
Course Title: Molecular Interactions of Bacteria with their hosts
Instructor (s): Woodward, Mougous
Location: SLU
Credits: 3
Quarter, Weeks, and Frequency course is offered: Spring, odd years
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.

Foundational Course 3B:

Course Number: Conj 558
Course Title: Prokaryotic Biology
Instructor (s): Harwood
Location: UW
Credits: 3
Quarter, Weeks, and Frequency course is offered: Winter
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.

ELECTIVE COURSES

Elective Course One:

Course Number: IMMUN 441
Course Title: Basic Immunology
Instructor (s): Jakob von Moltke
Location: UW
Credits: 4
Quarter, Weeks, and Frequency course is offered: Autumn, 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.

Elective Course Two:

Course Number: IMMUN 538
Course Title: Immune-based diseases and treatments
Instructor (s): Ram Savan, Estelle Bettelli
Location: SLU
Credits: 2
Quarter, Weeks, and Frequency course is offered: Spring, every year
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 Three:

Course Number: Conj 557
Course Title: Microbial Evolution
Instructor (s): Sokurenko
Location: UW
Credits: 1.5
Quarter, Weeks, and Frequency course is offered: Spring, every year
Attributes: Lecture based, extensive use of primary literature
Sub Area (if applicable): Microbiology
Synopsis: Selected topics in microbial evolution including evolution of the main lines of descent, and bacterial and archaeal speciation and co-speciation, and evidence for early microbial life on Earth.

Elective Course Four:

Course Number: Conj 549
Course Title: Population Biology of Microorganisms
Instructor (s): Mittler
Location: UW
Credits: 1.5
Quarter, Weeks, and Frequency course is offered: Spring, every year
Attributes: Lecture based, extensive use of primary literature
Sub Area (if applicable): Microbiology
Synopsis: Principles of ecology and evolution as they apply to microorganisms

Elective Course Five:

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, every year
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 Six:

Course Number: Global Health 566
Course Title: Biochemistry and Genetics of Pathogens and Their Hosts
Instructor (s): LeAnn Campbell
Location: UW
Credits: 3
Quarter, Weeks, and Frequency course is offered: Autumn, 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.

Elective Course Seven:

Course Number: Pathobio 552
Course Title: Cell Biology of Human Pathogens and Disease
Instructor (s): Hybiske, Grundner
Location: UW
Credits: 3
Quarter, Weeks, and Frequency course is offered: Winter, every year
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.

GENERAL METHODS/PROFESSIONAL DEVELOPMENT (GM/PD) COURSES

GM/PD Course One:

Course Number: UCONJ 510
Course Title: Introductory Laboratory Based Biostatistics
Instructor (s): Lloyd Mancl
Location: UW
Credits: 2.0
Quarter, Weeks, and Frequency course is offered: Summer
Attributes: Lecture-based with assignments
Sub Area (if applicable):
Synopsis: Introduces methods of data description and statistical inference for experiments. Covers principles of design and analysis of experiments; descriptive statistics; comparison of

group means and proportions; linear regression; and correlation. Emphasizes examples from laboratory-based biomedical sciences, and provides demonstrations using standard statistical programs.

GMPD Course Two:

Course Number: MCB 533
Course Title: How to give a scientific seminar
Instructor(s): Jihong Bai
Location: FH
Credits: 1.5
Quarter, Weeks, and Frequency course is offered: Winter, weeks 1-5, *will be offered in 2023*
Attributes: Career development and methods
Sub Area (if applicable):
Synopsis: A crucial part of a scientific career is the ability to effectively deliver a research seminar. This course will focus on all aspects of giving a seminar and teach students how to introduce the research topic, how to make clear and effective slides, and how to explain methods and data in a clear manner. Students will prepare their own research seminar throughout the course. Each week they will practice a part of it and receive feedback from other students and the instructors. By the end of the course, students will have an entire seminar about their thesis project prepared. The course will also give examples of good and bad seminars and help students learn how to communicate with non-scientists about their research.

GM/PD Course Three:

Course Number: MCB 543
Course Title: Logic Constructs and Methodologies of Biological Research
Instructor(s): Sandra Bajjalieh
Location: UW
Credits: 3.0
Quarter, Weeks, and Frequency course is offered: Spring, weeks 1-10, *will be offered in 2022*
Attributes: Career development and methods
Sub Area (if applicable):
Synopsis: This course surveys the logic and methods of scientific practice from historical, practical, and sociological points of view. Topics covered include how the philosophy of science influences experimental approaches, how the demarcation between science and pseudoscience has evolved, how common cognitive biases lead to errors in judgement and interpretation, and how sociological factors impact scientific progress.

GM/PD Course Four:

Course Number: MCB 560
Course Title: MCB Biotechnology Externship
Instructor(s): Nina Salama
Location: TBA
Credits: 2.0
Quarter, Weeks, and Frequency course is offered: Summer, weeks 1-10
Attributes: Career development and methods
Sub Area (if applicable):
Synopsis: This externship program provides MCB students with the opportunity to gain firsthand research experience in biotechnology companies in the Puget Sound area. Applications are available in the early spring and reviewed by the Externship Program Director. Applications are

submitted to participating companies to find a suitable match. This externship is only available during the summer between Year 1 and Year 2 to students who have completed 3 rotations and identified a dissertation laboratory. Students are supported by MCB for the summer quarter.