2022-2023 MCB Area of Interest Course Information
Cell Signaling & Cell/Environment Interactions

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

FOUNDATIONAL COURSES

Foundational Course One:
Course Number: CONJ 531
Course Title: Signaling Mechanisms in Excitable Cells
Instructor(s): Chip Asbury, Sharona Gordon
Location (e.g., UW, FH, SLU): UW
Credits: 1.5
Quarter, Weeks, and Frequency course is offered: Autumn, weeks 1-5
Attributes (e.g., graded, lecture-based): Lecture-based with weekly assignments.
Sub Area (if applicable):
Synopsis: Mechanisms of cellular signaling, particularly in nerve and muscle. Electrical, chemical, and mechanical signaling in the cell that led to processes such as electrical excitability, action potentials, and muscle contraction.
NOTE: this course only covers the first 5-weeks of a quarter-long course, NEURO504. If your main interest is in neurobiological research, we recommend enrolling in the full course (NEURO504).

Foundational Course Two:
Course Number: CONJ 532
Course Title: Signal Transduction: From the cell membrane to the nucleus
Instructor(s): Shao-En Ong, Smita Yadav
Location: UW
Credits: 1.5
Quarter, Weeks, and Frequency course is offered: Winter, weeks 6-10
Attributes: Lecture and Literature Review
Sub Area (if applicable):
Synopsis: Intracellular signaling pathways leading from cell membrane receptors to nucleus. Pathways activated by seven transmembrane receptors and G-proteins, insulin/PI3 kinase, nitric oxide and WNTs and mechanisms of signal termination. Cytokine/Jak/Stat signaling and role of subcellular localization in signal transduction.

Foundational Course Three:
Course Number: PHCOL 531
Course Title: Genetic Analysis of Signaling Systems
Instructor(s): Stanley McKnight
Location: UW
Credits: 3
Quarter, Weeks, and Frequency course is offered: Spring, odd years, weeks 1-10, will be offered in Spring 2023
Attributes: Lecture-based with literature review
Sub Area (if applicable):
Synopsis: Introduction to classic model organisms including plants, yeast, slime mold, flies, worms, fish, mice, and humans and a discussion of their use in current signal transduction research.

ELECTIVE COURSES
Signaling occurs in all cells. Because the field of cell signaling is relevant to all aspects of cell and molecular biology, students choosing this area of interest will usually find their work overlaps with at least one of the other areas of interest. Therefore, we advise students who choose this area to identify a secondary (minor) area of interest and include electives from that area in their course plans.

GENERAL METHODS/PROFESSIONAL DEVELOPMENT (GM/PD) COURSES

GM/PD Course One:
Course Number: BIOL 540B
Course Title: Uncommon Leaders: Women in Black, Indigenous, People of Color in Science
Instructor(s): Billie Swalla
Location: TBA
Credits: 2.0
Quarter, Weeks, and Frequency course is offered: Spring, weeks 1-5
Attributes: Graded, Career development and methods
Sub Area (if applicable):
Synopsis: This course is to learn about Women and Black, Indigenous, People of Color in Science and how they have extra challenges to overcome because of their identity. The way that some people think about their science is different and can lead to new discoveries and insights. It is important that you delve into the person that you choose to study and also what is exciting and transformational about their science. We will work on Wikipedia pages for these scientists and you will contact them and hopefully be able to interview them.

GM/PD Course Two:
Course Number: CENV 500
Course Title: Communicating Science to the Public Effectively
Instructor(s): Nicole Gregorio
Location: UW
Credits: 3.0
Quarter, Weeks, and Frequency course is offered: Winter, will be offered in Winter 2023
Attributes: Career development and methods
Sub Area (if applicable):
Synopsis: Whether you’re looking to give an unforgettable job talk, change a policymaker’s mind, or finally get your family to understand your research, the Engage course is a great professional development opportunity and learning experience. This is a discussion-based course for graduate students in the sciences that focuses on effective techniques for communicating science, with an emphasis on sharing your science with non-specialists. At the end of the quarter, each student will present a 20 minute public talk on their graduate research to be delivered during the 2023 Engage: The Science Speaker Series at Town Hall Seattle. In this course, students will:
- Develop and practice analogies to distill their research
- Perfect their elevator pitches
- Practice storytelling, audience consideration, and cultural competency
- Play improv games to leverage improvisation as a public speaking tool
- Engage in weekly readings and discussions

Updated December 2022
• Hear from guest speakers on science communication

Note: Space is limited in this course and it often fills quickly, with an extensive waitlist. An application process and expectation agreement must be completed by the student to be considered for the course. Please reach out to the instructor for more information.

GM/PD Course Three:
Course Number: MCB 512
Course Title: Scientific Speaking 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 Four:
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 2023
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. After completing the course, students should understand and interface differently with science they encounter, papers they read, and their own projects.

GM/PD Course Five:
Course Number: MCB 560
Course Title: MCB Biotechnology Externship
Instructor(s): Celeste Berg
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.

**GM/PD Course Six:**

- **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.