

2021-2022 MCB Area of Interest Course Information

Gene Expression, Cell Cycle & Chromosome Biology

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

FOUNDATIONAL COURSES

Foundational Course One:

Course Number: CONJ 537

Course Title: Mechanisms of transcriptional regulation

Instructor (s): Steve Hahn, Toshio Tsukiyama, Sita Kugel, Daphne Avgousti

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

Credits: 1.5

Quarter, Weeks, and Frequency course is offered: Autumn, weeks 6-10, even years

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

Sub Area (if applicable):

Synopsis: A five-week graduate survey course concentrating on biochemical mechanisms of gene transcription. The course will cover a broad range of transcriptional regulation including:

Mechanisms of transcriptional initiation; Regulation of transcription by chromatin;

Transcriptional regulation, development and diseases in mammals.

ELECTIVE COURSES

Elective Course One:

Course Number: CONJ 524

Course Title: Structural basis for signal transduction

Instructor (s): TBA

Location: UW

Credits: 1.5

Quarter, Weeks, and Frequency course is offered: Winter, weeks 6-10

Attributes: Lecture-based

Sub Area (if applicable):

Synopsis: There are three learning objectives. **(1)** By the end of the course, students are expected to know the common structural features and signaling/regulatory principles of most important signaling protein families, including kinases, phosphatases, ubiquitin ligases, G-proteins and GPCRs. **(2)** Through structural analysis, students are expected to learn ways to design approaches to specifically manipulate or control these molecular systems. **(3)** Through homework and discussions, students are required to be able to download PDB files, analyze the molecular structure (using program such as Pymol), and obtain desired structure-function relationship information.

Elective Course Two:

Course Number: CONJ 544

Course Title: Protein structure, modification and regulation

Instructor (s): Barry Stoddard

Location: FH

Credits: 1.5

Quarter, Weeks, and Frequency course is offered: Winter, weeks 1-5, will be offered in Winter 2023

Attributes: Lecture-based

Sub Area (if applicable):

Synopsis: Overview of general principles of protein structure, including forces that contribute to folding and stabilization, followed by an extended coverage of the means by which protein structure and function are modified and regulated. Examples from recent developments in protein folding, processing, and allosteric regulation.

Elective Course Three:

Course Number: PHCOL 535

Course Title: Transcriptional control of human disease

Instructor (s): Edith Wang

Location: UW

Credits: 3.0

Quarter, Weeks, and Frequency course is offered: Spring, weeks 1-5

Attributes: lecture-based

Sub Area (if applicable):

Synopsis: The focus of the course will be on the discussion of molecular mechanisms controlling gene transcription and how they contribute to the development or treatment of human disease. We also will introduce technological advances that have arisen in this area of research over the past few years. Classes will include lectures, student-driven discussions (with faculty guidance), and analysis of the current literature. The course objectives are:

1. Introduce students to the process of gene transcription, mechanisms of regulation, contribution of chromatin structure and epigenetics, and their involvement in the development and treatment of human disorders.
2. Teach students how to interpret and critically analyze the primary literature.
3. Strengthen oral communication skills with a class discussion format.

Elective Course Four:

Course Number: MCB 539

Course Title: Biological Basis of Neoplasia

Instructor (s): David MacPherson

Location: FH

Credits: 3

Quarter, Weeks, and Frequency course is offered: Spring, weeks 1-10, *will be offered in Spring 2022*

Attributes: Lecture and Literature Review

Sub Area (if applicable):

Synopsis: Introduces the major themes in research in the biology of neoplastic change. Covers principle molecular mechanisms responsible for tumor initiation and progression, with a specific emphasis on intracellular signaling, DNA repair, cell cycle checkpoints, and loss of normal tissue homeostasis. The latest state of the art research in Cancer Biology will be presented by invited scientists, experts in their relevant field. The discussion meetings will concentrate on selected major papers in cancer biology and be presented and discussed by the students with help and guidance of the instructors.

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.