

2024-2025 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): TBD

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

Credits: 1.5

Quarter, Weeks, and Frequency course is offered: Autumn, weeks 6-10, even years. *Will be offered in Autumn 2026.*

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.

Note: Alternatively, similar course material is covered in GENOME 551 – Principles of Gene Regulation (Winter, weeks 6-10, *will be offered in Winter 2025*, 1.5 credits). Enrollment priority is given to Genome Sciences graduate students.

ELECTIVE COURSES

Elective Course One:

Course Number: CONJ 532

Course Title: Signal Transduction from The Cell Membrane to The Nucleus

Instructor (s): TBD

Location: UW

Credits: 2

Quarter, Weeks, and Frequency course is offered: Autumn, weeks 6-10. ***Course is not currently being offered***

Attributes: Lecture

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, MAPKs, and WNTs and mechanisms of signal termination. Cytokine/Jak/Stat signaling and role of subcellular localization in signal transduction.

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, every year. *Will be*

offered in Winter 2025

Attributes:

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. **Prerequisite(s):** Introductory biochemistry and cell biology.

Elective Course Three:

Course Number: GENOME 565

Course Title: Advanced Human Genetics

Instructor (s): Evan Eichler, Mary-Claire King

Location: UW

Credits: 4

Quarter, Weeks, and Frequency course is offered: Winter, weeks 1-10. *Will be offered in Winter 2025*

Attributes: Lecture, literature review

Sub Area (if applicable):

Synopsis: Explores genetic analysis of naturally occurring variation in humans; origins and consequences of mutation, as mediated by selection, migration, population structure, and drift; approaches to finding human disease genes and characterizing them at the molecular level; relevance of other species to analysis of human genes. **Prerequisite(s):** GENOME 361 or GENOME 371.

Elective Course Four:

Course Number: MCB 522

Course Title: The Developmental Basis of Human Disease

Instructor (s): TBD

Location: FH

Credits: 3

Quarter, Weeks, and Frequency course is offered: Winter, weeks 1-10, even years. *Will be offered in Winter 2026*

Attributes: Lecture, literature review

Sub Area (if applicable):

Synopsis: Uses recent discoveries in human genetics to guide student learning about animal development. Explores the normal developmental function of genes that have been identified as causal in human developmental disorders such as skeletal dysmorphologies, ciliopathies, autism, and cancer.

Elective Course Five:

Course Number: MCB 539

Course Title: Biological Basis of Neoplasia

Instructor (s): David MacPherson, Robert Eisenman

Location: FH

Credits: 3

Quarter, Weeks, and Frequency course is offered: Spring, weeks 1-10. *Will be offered in Spring 2026*

Attributes: Lecture, 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.