MGY311Y Molecular Biology. 2024-25 Schedule

Location: Medical Sciences Bldg MS 4279.

Time: Mondays, Wednesdays and Fridays, 9:00 – 10:00 A.M. (except for term tests 2 and 3: see details below).

Term 1: September 4 to December 2, 2024.

1. Molecular Biology: core concepts and approaches. (Dr. Rick Collins)

 Sept. 4 to 27.

 How science is done in molecular biology; the experimental basis of what we “know”.

 Nucleic acid structure. Protein-nucleic acid interactions, experimental design and interpretation.

**Mini term test Monday Sept 30. 10% of the course grade.**

2. DNA Replication (Drs. Barb Funnell and Rick Collins)

 Oct 2 – Oct. 23; except Oct. 14 (Thanksgiving: no lecture)

 DNA replication in E. coli - initiation, elongation, termination; protein machines; eukaryotic DNA replication; regulation; replicating the ends of chromosomes.

**First real term test: Friday Nov 8. (15% of the course mark).**

**90 minutes: 8:30 am to 10:00 am. Location TBA.**

3. DNA Repair (Dr. Rick Collins)

 Oct 25 to Nov 13 (except Oct 28 to Nov 1; fall term study break).

 Mutagenesis; DNA repair mechanisms.

4. Recombination. (Dr. Rick Collins)

 Nov 15 to Dec 2.

 Homologous, site-specific, and transpositional recombination in prokaryotes and eukaryotes.

**Second term test: TBA during the Christmas assessment period (20% of the course mark). Two hours.**

Term 2. January 6 to April 4, 2025.

5. Transcription (Dr. Julie Claycomb)

 Jan 6 to Jan 22.

Mechanisms of transcription - initiation, elongation, termination; initiation complexes in E. coli and eukaryotes; regulation of transcription.

6. RNA Processing. (Dr. Rick Collins)

 Jan. 24 to Feb 14

 Processing and modification of tRNA and ribosomal RNA precursors; catalytic RNAs; processing of mRNA precursors; non-coding RNAs; RNA editing; RNA silencing; RNA localization.

**Reading week: Feb. 19 - Feb. 23. No classes.**

**Third term test: Monday, Feb. 24. (20% of the course mark).**

**90 minutes: 8:30 am to 10 am. Location: TBA.**

7. Translation and Post-translational processing. (Dr. Andrew Wilde)

 February 26 – March 21.

 Genetic code(s), tRNA and aminoacyl tRNA synthetases; structure of the ribosome; protein synthesis - initiation, elongation, termination; regulation of translation; secretion and targeting; post-translational modification.

8. Functional Genomics. (Drs. Julie Claycomb and Rick Collins).

 March 24 – April 4.

 Integrative approaches to identifying gene functions.

**Final exam: during the Final exam period April 2024 (20% of the course mark).**

**Grading Summary.**

**10% Mini term test. Monday Sept 30 2024.**

**10% Term test 1. Friday Nov 8 2024.**

**20% Term test 2. TBA Christmas Assessment period 2024.**

**20% Term test 3. Monday Feb 24, 2025.**

**20% In-class quizzes and homework assignments: throughout the course.**

**20% Final Assessment. TBA: April Assessment period, 2025.**