

Biochemistry 4484E – proposed course outline and course schedule

Biochemistry 4484E – Student-Directed Research Project

With faculty mentorship, student-teams will design, build, test, and defend an interdisciplinary lab-research project. The teams will assess how their project will integrate into real-world scenarios and present their research in multiple formats. The objective of this course is for students to develop their problem-solving and research abilities.

Antirequisite(s): Anatomy and Cell Biology 4480E, Biochemistry 4483E, Chemical Biology 4500E, Medical Biophysics 4970E, Microbiology and Immunology 4970E, Pathology 4980E.

Prerequisite(s): Biochemistry 3380G, Biochemistry 3381A and Biochemistry 3382A, with marks in each of at least 70%. Enrolment is limited, and is available only to students in Year 4 of Honours

Specialization modules in Biochemistry, Biochemistry and Cell Biology, Biochemistry of Infection and Immunity, and Computational Biochemistry. Students in the Honours Specialization in Biochemistry of Infection and Immunity may substitute either Microbiology and Immunology 3610F or Microbiology and Immunology 3620G with a minimum mark of 70% in lieu of Biochemistry 3380G as a prerequisite.

Students in the Honours Specialization in Computational Biochemistry may substitute Biochemistry 3383F/G with a minimum mark of 70% in lieu of Biochemistry 3380G as a prerequisite.

Extra Information: 15 hours per week. Enrolment in this course is limited.

Course Weight 1.50

Course Coordinator: Dr. Brian Dempsey, Assistant Professor, Department of Biochemistry

Proposed Course Schedule:

September: Formation of teams + Idea Phase + Training

- 1) Research for project topics
- 2) Feasibility assessment and Peer review
- 3) Selection of final topic
- 4) Course information
- 5) Safety and lab training
- 6) Research integrity training
- 7) Consultation with interdisciplinary faculty members

October: Design phase

- 1) Planning of Synthetic Biology constructs and Peer review
- 2) Lab work strategy development
- 3) Assay design
- 4) Ordering DNA constructs
- 5) Preliminary lab work
- 6) First team presentation of research plan/Pitch

November-December: Building phase

- 1) Extensive lab work
- 2) Initial framework of project Wiki website due
- 3) Written materials due: Project rationale, Project design, Initial results, Initial analysis of real-world project integration.

January-February: Testing phase

- 1) Completion of lab work
- 2) Assay and testing of DNA constructs
- 3) Framework for final project report due

March: Presentation phase

- 1) Completion of Wiki website
- 2) Final team presentation
- 3) Final peer review

Draft of Grading Structure

Initial Project brainstorming and research + presentation (individual) 5%

Project design – DNA constructs and assembly plan + testing plan (individual) 5%

First presentation (group) 10%

Second presentation (group) 15%

Final project summary wiki (group) 40%

Performance evaluation (individual) 15%

Weekly progress summary and meeting (individual) 10%