BIOL 403
Experimental Techniques in Biology
Winter Term (2024-25)

CALENDAR DESCRIPTION

Self-directed and self-selected hands-on experimental techniques used in fundamental biology research, biotechnologies, and medical sciences.

PREQUISITE BIOL 205/3.0

SCHEDULE
Date and time selected by student

Instructor	See onQ
Instructor Contact	The course does not communicate by email and no appointment is needed. Instructor is available for any question, concern, help, book/rebook a lab Mon-Fri 10am-6pm.
Office Hours	Mon-Fri 10am-6pm
TA:	See onQ
TA Contact Information	BioSciences 2511, 2621 or 3312
Office Hours	Mon-Fri 10am-6pm

LEARNING OBJECTIVES

Basic calculations in experimental molecular techniques
Operation of scientific equipment such as pipettes, balances and spectrophotometer
Absorption Spectrum
Molar Absorptivity
Protein Detection
Protein Quantification
Enzymes Catalytic Activity (ß-gal)
Enzymes K_M and V_{MAX} (ß-gal)
Protein extraction

LEARNING HOURS

Teaching method		*Average hours per week*	*Number of weeks*	*Total hours*
In-class hours	Lecture			
	Seminar			
	Laboratory	4	6	24
	Tutorial			
	Practicum	1	7	7
	Group learning			
	Individual instruction			
Other	Online activity			
	Off-campus activity			
	Private study	10	7	70
Total hours on task				101

COURSE OUTLINE

There is no timetable for this course. The day and time a student complete a lab or test is chosen by the students.
Each student pair have to schedule between January 18th and April 5th 2024 6 labs at any date/time Monday to Friday 10:00 am to 6:00 pm.
Each individual student have to schedule between January 18th and April 5th 2024 the final at any date/time Monday to Friday 10:00 am to 6:00 pm.

TEXTBOOKS/READINGS

Free and open access course: All course content available worldwide 24/7 with no restrictions of any kind:
http://130.15.90.125/BioLab/Biol403.html
All learning material is provided to students free of charge.

GRADING SCHEME

Component	**Weight (%)**	**Date**
Calculation tests (6)	25	Chosen by student pair
Pipetting test	5	Chosen by student
Lab reports	30	Chosen by student pair
Safety and guidelines	up to 5% penalty	
Final (Practical exam)	40	chosen by student

All tests are open-book with no time limit.
Calculation tests: Laboratory experiments require that one must be able to perform simple calculations (concentrations, dilutions) quickly and accurately, and be able to prepare solutions (instructions: https://130.15.90.125/BioLab/solutions-and-cultures/1_1.html). A calculation session will be offered 3

times (see web site for dates). Students will take a calculation test at the beginning of each lab (6 calculation tests). Each calculation test includes 5 calculations (less than 1 min needed per calculation).
Pipetting test: Before a student perform the first lab, he will first learn and train how to pipette consistently and accurately (instructions: https://130.15.90.125/BioLab/equipment/micropipettes.html). Student can come in person Mon-Fri 10am-6pm to practice pipetting before taking the first lab. Each student can take the test before taking their first lab or at the beginning of their first lab. The test requires the student to pipet 3 times a fixed volume and is marked by a balance. Pipetting accuracy assessment: each pipetting within 2% of the expected value will give 75 out of 100% (3 x 25%). Pipetting reproducibility: 3 pipetting within 2% of each other will give 25% out of 100%. Each incorrect handling of the micropipettes may results in 2% penalty.
Taking a lab and lab reports: Student pair will book your lab at their desired date/time at least 24h ahead. Student pair do not have to notify if they do not attend their scheduled lab and it is the student responsibility to rebook a missed lab and to notify their labmate. Students have read and understood theory, material (and how to use equipment) and practical.Report (lab book) has been printed and is filled and followed to perform experiments and report results. Student pair analyze/interpret experimental data and give lab report to instructors (one report per student pair). Student get their lab report back before starting next lab.
Final exam: The final examination is practical and is done individually (no lab mate). Students cannot take the final at the same time as their labmate (lab book needed to take the final). Students can schedule their final exam at any time Mon-Fri 10am-6pm as soon as they have completed the 6 labs.

GRADING METHOD

In this course, components will be graded using numerical percentage marks.
Your course average will then be converted to a final letter grade according to Queen's Official Grade Conversion Scale:

Queen's Official Grade Conversion Scale

Grade	Numerical Course Average (Range)
A+	90-100
A	85-89
A-	80-84
B+	77-79
B	73-76
B-	70-72
C+	67-69
C	63-66
C-	60-62
D+	57-59
D	53-56
D-	50-52
F	49 and below

ACADEMIC INTEGRITY AND QUEEN'S CODE OF CONDUCT

Students are responsible for familiarizing themselves with the regulations concerning academic integrity and for ensuring that their assignments and conduct conform to the principles of academic integrity. Information is available in the Arts and Science Calendar (see Academic Regulation 1 - http://www.queensu.ca/artsci/academic-calendars/regulations/academic-regulations, on the Arts and Science website (see http://www.queensu.ca/artsci/academics/undergraduate/academic-integrity), and at Biology's website (http://www.queensu.ca/biology/undergrad/integrity.html) and from the instructor of this course. Departures from academic integrity include plagiarism, use of unauthorized materials, facilitation, forgery and falsification, and are antithetical to the development of an academic community at Queen's. Given the seriousness of these matters, actions which contravene the regulations on academic integrity carry sanctions that can range from a warning or the loss of grades on an assignment to the failure of a course to a requirement to withdraw from the university.

ACCOMMODATION POLICY, EXAM CONFLICTS, AND OTHER CONFLICTS

Students who feel they need accommodations for disabilities or extenuating circumstances, or have a conflict between exams or other commitments should consult the Biology Department's website for details about how to proceed (http://www.queensu.ca/biology/undergrad/integrity.html). In general, the earlier a course coordinator is apprised of an extenuating circumstance, the more likely an accommodation can be made. Students are encouraged to be proactive in anticipating difficulties, when it is possible to do so.

Students may apply to write a make-up or deferred exam if they have an exam conflict as defined in the Academic Regulations of the Faculty (See Arts and Science Calendar Regulation 8 - http://www.queensu.ca/artsci/academic-calendars/regulations/academic-regulations). In this case, the student should report to the Exams Office first to verify that there is a genuine exam conflict. Biology professors will not consider your situation to be a conflict unless it meets the criteria set out by the Faculty of Arts and Sciences.

Students may request a make-up or deferred exam if they have an exam conflict with off-campus travel associated with a field course (e.g BIOL-307/3.0 or 407/3.0) that is held during the fall or winter terms.

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ACCOMMODATION OF DISABILITIES

Queen's University is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. If you are a student with a disability and think you may need accommodations, you are strongly encouraged to contact the Disability Services Office (DSO) and register as early as possible. For more information, including important deadlines, please visit the DSO website at: http://www.queensu.ca/hcds/ds/