Western Science

Department of Biology

GENOMICS AND BEYOND: A LABORATORY COURSE
Biology 3596A
Course Outline/Syllabus Fall 2024

1. Course Information and Prerequisites:

Biology 3596A/B is a laboratory course. The emphasis is on individual, hands-on laboratory experience and scientific skills, particularly scientific writing. Six synchronous hours/week are devoted to this course (2 **in-person** lecture hours, 4 **in-person** lab hours)

- Lectures will be in-person**.** Most classes will involve graded Activities (marked mainly for completion) that can be completed and submitted in class. Please bring paper and a pen, and, if available, a laptop, tablet, and/or smart phone (with internet capabilities) so you we can workshop your scientific skills.
- Lab sections: Students have enrolled in a specific lab section. All laboratory sessions will be **in-person**, starting the week of Sept 9–13.
- Additional course content and submission of most major assessments will use the **course OWL Brightspace site**.

List of Prerequisites
A minimum mark of 70% in each of Bio 2581B and Bio 2290F/G; and registration in year 3 or 4 of an Honours Specialization in Genetics or Genetics & Biochemistry, or major or minor in Genetics.

Unless you have either the prerequisites for this course or written special permission from your Dean's Designate (Department/Program Counsellors and Science Academic Counselling) to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees if you are dropped from a course for failing to have the necessary prerequisites.

2. Instructor Information

Instructor: Dr. Daniel Jeffery
Laboratory Supervisor: Kim Loney
Teaching Assistants: See OWL site

Communication Policies:
Our course could include many potentially sensitive issues involving real-world problems/data related to genetics, including human genetics, so it essential that the class remains a welcoming, open and respectful environment for everyone. That will be our shared responsibility. I hope that through the various Discussion Forums here on OWL, in your Labs, and in the live sessions with me, you will be able to work collaboratively with your peers to give each other support and feedback throughout the term.

OWL Announcements: Please make sure you are receiving email notifications for the OWL Announcements. This is how I will communicate critical course updates and important information to you. Not being aware of information provided in the Announcements cannot be used as justification for an appeal.

OWL Forums: Please use the OWL forums for any course/lab content questions or other general discussion, so that the rest of the class can benefit from your questions/responses. Postings on the discussion forums should be politely worded and courteous. Please title topic threads with relevant key words such that others may easily discern the content. The moderator (me) may remove inappropriate posts. You can typically expect an answer from me within 1 to 2 business days.

Emails: Please use email only for questions/concerns that are specific to you. I highly recommend that you use your Western (@uwo.ca) email addresses when contacting your instructors and include "Bio3596" in the subject title, as well as informative information, otherwise, they may be identified as spam. You can typically expect an answer from me within 1 to 2 business days. *As mentioned above, content questions or general questions that everyone could benefit from should be put into the Forums. So, if you email me with these kinds of questions, expect me to ask you to put it in the Forums first. I will answer you there. So, it is simpler and faster just to ask those questions in the Forum in the first place ;)*

Please do not email TAs as responding to student emails has not been included as part of their TA duties.

Office hours: My office hours will be, in-person or by Zoom, as you prefer, through open scheduling via the Calendly app. If you think we'll need more than 15 minutes, you can book up to a maximum of three back-to-back meetings, depending on available time slots. If you don't see any available slots that work for you, send me an email and we'll work something out together. Note: my office hours are more than just a chance for you to ask questions about content, consider these also as an opportunity for you to connect with me, get additional feedback on your work/marks, explore what you may want to do after you graduate, and find support.

3. Course Description, Learning Outcomes, Schedule, Delivery Mode

Course Description

A practical introduction to modern experimental approaches in genetics and molecular biology as applied to such topics as genomics (gene identification and classification), functional genomics (genome expression profiles) and bioinformatics (computational genomic analysis).

The goal of this course is to provide hands-on experience with core genetics laboratory techniques to give you the foundations of knowledge and skills required to interpret and perform modern genetics experiments. Here, we will combine what you've learned so far about genetics, molecular biology, and scientific methodology into several practical experiments, enhancing the breadth and depth of your knowledge in these areas while also providing opportunities to develop your skills in experimental methodology, scientific communication, critical thinking, and hypothesis building. As an introduction to big data in biology, which has become a staple of modern genetics research, we will also make use of online genomics resources.

Course structure

This is a skills-based course with a heavy workload. To succeed, you are expected to read the Lab Manual in advance, arrive to lab fully informed about the day's experiments, and be ready to spend the full lab period working, if needed. The labs are divided into five main projects. Each project contains an integrated series of experiments that run over several weeks, with experiments from different projects often overlapping to be more efficient with lab time (just as we do in research labs). Two weeks after the end of each project, a report summarizing and interpreting the results will be due.

While the labs are there to give you hands-on technical experience, the lectures will focus on the development of the other essential scientific skills that researchers require, including designing research questions, literature and database research, scientific writing, and peer discussion. Please come to the lectures prepared to work, interact with your peers, and discuss. As well, in combination with occasional online videos and readings, the lectures will provide the basic theoretical background information required to understand the lab experiments and give you the tools needed to successfully complete your assessments. Note: most live classes will involve graded Activities that can be completed and submitted in class. When possible, asynchronous alternatives will be available on the OWL site, but active participation in all live sessions is highly encouraged.

Learning outcomes

Upon successful completion of the course, you will be able to:

1. Perform foundational molecular biology and genetics experiments based on given protocols, including DNA/RNA isolation, PCR/Reverse Transcriptase-PCR, qPCR, electrophoresis, DNA cloning/sub-cloning, and yeast culture
2. Record experimental methods and results in a manner enabling reproducibility
3. Interpret experimental results and compare your conclusions to scientific literature
4. Clearly communicate molecular biology and genetics research findings—in written, oral or multimedia formats—to an academic or lay audience
5. Explain how fundamental molecular biology and genetics techniques can be used to understand genetics in model organisms and humans
6. Compare genetic sequences from different species using publicly available genome databases
7. Collaborate with peers to perform experiments and communicate your findings

Key Dates:

Semester begins: Sept 5, 2024 (no lecture or labs this week)
First lecture for the course: Sept 9, 2024
First labs for the course: Sept 12 or 13, 2024 (depending on lab section)
National Day for Truth and Reconciliation: Sept 30, 2024 (no lecture, but labs continue as usual)
Fall Reading Week: Oct 12–20, 2024 (no lecture or labs this week)
Last day to drop the course without academic penalty: Nov 11, 2024
Last lab for the course: Nov 28 or 29, 2024 (in-lab practical test)
Last lecture for the course: Dec 1, 2024
Semester ends: Dec 6, 2024 (final submissions)
Exam period: Dec 9–22, 2024 (no final exam for this course)

Schedule

Lecture/Lab	Date	**Description** (subject to change)	Lab Project				
Week 0	Sept 5/6	No lecture/labs					
Lecture 1	Sept 9	Fundamental techniques: PCR, RE, agarose, gel imaging	1	2			
Lab 1	**Sept 12 / 13**	**Project 1: Intro Lab Pipette test, PCR, RE digest, agarose gel** **Project 2: Murder Mystery Cheek swab**					
Lecture 2	Sept 16	Forensic genotyping: DNA extraction, polymorphic markers, PAGE					
Lab 2	**Sept 19 / 20**	**Project 2: DNA extraction, agarose gel, PCR**					
Lecture 3	Sept 23	Using model systems & Light-sensitive pathway in Arabidopsis Assessing gene expression			3		
Lab 3	**Sept 26 / 27**	**Project 2: PAGE** **Project 3: Gene Expression Plant photo, RNA extraction, nanodrop** **→ Lab Assignment 1 (3%) due Fri Sept 27, 11:55pm**					
No lecture	Sept 30	*National Day for Truth and Reconciliation* (Sept 30)					
Lab 4	**Oct 3 / 4**	**Project 3: RNA gel, cDNA synthesis, qPCR**					
Lecture 4	Oct 7	Cloning				4	
Lab 5	**Oct 10 / 11**	**Project 4: Cloning RE digest, plasmid cleanup, gel band isolation** **→ Lab Assignment 2 (8%) due Fri Oct 10, 11:55pm**					
No lecture / labs	Oct 12 – 20	*Reading week*					
Lecture 5	Oct 21	Yeast genetics					
Lab 6	**Oct 24 / 25**	**Project 4: Ligation, Transformation** **Project 5: Yeast genetics Pick and re-streak colony**					5
Lecture 6	Oct 28	Yeast genetics continued					
Lab 7	**Oct 31 / Nov 1**	**Project 4: Pick transformants, inoculate media** **Project 5: Yeast mating** *(Optional: *PAGE practice*)* **→ Lab Assignment 3 (11%) due Fri Nov 1, 11:55pm**					
Lecture 7	Nov 4	Genome sequencing & exploring genome databases *Start Genomics Analysis*					
Lab 8	**Nov 7 / 8**	**Project 4: Miniprep DNA** **Project 5: Yeast complementation & β-gal re-streaking**					
Lecture 8	Nov 10	Guest lectures TAs					
Lab 9	**Nov 14 / 15**	**Project 4: RE digest, agarose gel** **Project 5: β-gal reveal, score results** **→ Genomics Analysis (10%) due Fri Nov 15, 11:55pm**					
Lecture 9	Nov 18	Special Guest lecture					
No labs	--	*No labs this week*					
Lecture 10	Nov 25	Careers in Biology (panel)					
Lab 10	**Nov 28 / 29**	**→ In-lab practical test (20%)**					
Lecture 11	Dec 1	Lab assignment 4/5 presentations, course wrap-up					
Final submissions	**Dec 6**	**→ LAB ASSIGNMENT 4 (15%) due Fri Dec 6, 11:55pm** **→ LAB ASSIGNMENT 5 (15%) due Fri Dec 6, 11:55pm**					
Exam period	*Dec 10–22*	*No exams for this course.* **GOOD LUCK IN EXAMS AND HAVE A WONDERFUL HOLIDAY BREAK!**					

Contingency plan for in-person labs pivoting to 100% online learning
Although the intent is for this course to be delivered in person, should any university-declared emergency require some or all of the course to be delivered online, either synchronously or asynchronously, the course will adapt accordingly. The grading scheme will **not** change. Any assessments affected will be conducted online as determined by the course instructor.

Synchronous Zoom sessions may exceptionally replace the in-person lecture, if required (e.g., due to instructor illness or COVID-19 contingency planning). In such cases, an Announcement will be sent to the class via OWL, as soon as possible.

4. Course Materials

Lab Attire/Safety

All students while in the lab are required to wear appropriate WHMIS lab attire. This includes lab coat, safety glasses, long pants, socks, closed-toed shoes and gloves (as necessary). Long hair must be tied back. Those with prescription glasses are required to wear prescription safety glasses or goggles to fit over top of glasses. Students inappropriately dressed will be denied access to the lab and will not be rescheduled to attend another lab section.

You are required to supply your own lab coat and safety goggles. Lecture notes, laboratory outlines, protocols and associated readings will all be posted weekly on the OWL course website.

Laboratory Manual

- A laboratory manual outlining all experiments will be available through the course OWL website, in pdf and/or doc format.
- Students are expected to read the labs in advance and be ready when lab starts.

In-person lectures

As noted above, most classes will involve graded Activities (marked mainly for completion) that can be completed and submitted in class. Please bring paper and a pen, and, if available, a laptop, tablet, and/or smart phone (with internet capabilities) so you we can workshop your scientific skills.

Course Content

All course material (lecture slides/recordings (when available), videos, assignment guidelines, lab protocols, and reading materials, etc.) will be available on the OWL course website: https://westernu.brightspace.com/d2l/home

Students are responsible for checking the course OWL site on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class. If you need assistance with the course OWL site, you can seek support on the OWL Help page. Alternatively, you can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

Technical Requirements
Stable internet connection, laptop or computer, working microphone, webcam (optional)

Google Chrome or **Mozilla Firefox** are the preferred browsers to optimally use OWL. Update your browsers frequently. Students interested in evaluating their internet speed, please click **here.**

Access to Zoom (if necessary) will be via OWL. For technical assistance with Zoom, please contact the Western Technology Services Helpdesk at https://wts.uwo.ca/helpdesk/

Session recordings (audio and/or video): Depending on feasibility and audio/video capabilities in the room, in-person lectures and/or synchronous Zoom sessions (in the event of instructor illness or COVID-19 contingency plan) may be recorded and made available to students in the course for viewing remotely after each session. For questions or concerns about recording and use of videos in which you appear, please contact me.

As per university policies, **you may not share any course or student materials or videos** without explicit written permission from me and any students involved in their production.

5. Methods of Evaluation

The overall course grade will be calculated as listed below:

Assessment	Due Date	Weight
Activities (in lecture)	Throughout (best 6 of 8)	6%
Lab Assignments (x5)	1) Intro lab—Fri Sept 27, 11:55pm 2) Murder Mystery—Fri Oct 10, 11:55pm 3) Plant gene expression—Fri Nov 1, 11:55pm 4) DNA cloning—Fri Dec 6, 11:55pm 5) Yeast complementation—Fri Dec 6, 11:55pm	3% 8% 13% 15% 15%
Genomics Analysis	Fri Oct 27, 11:55pm	10%
eLab Notebook	Throughout (due one week after each lab)	10%
In-lab Practical Test	Nov 28 or 29 (according to your Lab Section)	20%

Visit the OWL site "Assessment Guidelines" section for details associated with each assessment.

General information about missed coursework
Students must familiarize themselves with the *University Policy on Academic Consideration – Undergraduate Students in First Entry Programs* posted on the Academic Calendar: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration_Sep24.pdf,

This policy does not apply to requests for Academic Consideration submitted for **attempted or completed work**, whether online or in person.

The policy also does not apply to students experiencing longer-term impacts on their academic responsibilities. These students should consult Accessible Education.

For procedures on how to submit Academic Consideration requests, please see the information posted on the Office of the Registrar's webpage: https://registrar.uwo.ca/academics/academic_considerations/
All requests for Academic Consideration must be made within 48 hours after the assessment date or submission deadline.

All Academic Consideration requests must include supporting documentation; however, recognizing that formal documentation may not be available in some extenuating circumstances, the policy allows students to make one Academic Consideration request **without supporting documentation** in this course. However, the following assessments are excluded from this, and therefore always require formal supporting documentation:

- in-lab practical test (defined by policy)

When a student *mistakenly* submits their one allowed Academic Consideration request **without supporting documentation** for the assessments listed above or those in the **Coursework with Assessment Flexibility** section below, the request cannot be recalled and reapplied. This privilege is forfeited.

Essential Learning Requirements

Even when Academic Considerations are granted for missed coursework, the following are deemed essential to earn a passing grade:

1. Minimum 65% attendance of all laboratory sessions (6 of 9)
2. Submission of at least three of Lab Reports 2–5, plus the Genomics Analysis and eLab Notebook
3. Completion of the in-lab practical test

Failure to meet these conditions* will result in a maximum achievable grade of 45% for the course.

*Note that students will not be penalized for failing to meet a requirement due to circumstances beyond their control. For example, if you miss handing in a lab report or miss too many labs due to illness or other serious circumstances, please make sure you submit your Academic Consideration request(s) within 48h of the missed deadline or lab, or earlier. At the same time, please contact me by email to explain the situation. **A short, general, description is fine.** Note, there is never a need to provide personal health information or documentation to me (or any instructor). If required, that should only be shared with in your Academic Consideration request or with your Academic Counsellor. Upon Academic Consideration approval, you will be given an opportunity to complete the requirements after you recover. However, for logistical reasons, it may be necessary for that opportunity to be with the next offering of the course, in which case you will receive a grade of Incomplete (INC) or Special Examination Criteria (SPC) until you complete the course requirements.

Coursework with Assessment Flexibility

By policy, instructors may deny Academic Consideration requests for the following assessments with built-in flexibility.

Deadline with a No-Late-Penalty Period

- Students are expected to submit all the assignments by the deadline listed. Should extenuating circumstances arise, students do not need to request Academic Consideration, and they are permitted to submit their assignment up to 48 hours past the deadline without a late penalty. Should students submit their assignments beyond 48 hours past the deadline, but less than 72h, a late penalty of 30% will be applied. No submissions will be accepted after 72h and the assessment will be marked as zero. Academic Consideration requests may be granted only for extenuating circumstances that started before the deadline and lasted longer than the No-Late-Penalty Period (48 hours). Note, the eLab Notebook and the In-lab Practical Test are excluded from this policy, because they require you to complete the work prior to entering the lab and during the lab, respectively, and should therefore follow the above Academic Consideration policy.

Flexible Completion

- **Activities.** This course will have at least 8 Activities, and the 6 Activities with the highest marks are counted towards your final grade. Each Activity will have an asynchronous option and can be submitted within a 7-day period, plus the 48h No-Late-Penalty Period for extenuating circumstances, mentioned above. Should extenuating circumstances arise, students do not need to request Academic Consideration for the first 2 missed Activities, since they will not be counted towards your grade anyway. Given the flexibility designed into this Assessment, Academic Consideration requests will be denied for additional missed Activities, unless the Academic Consideration spans all (>2) of the missed Activities.

Grading errors: If you notice a clear error in your mark, please bring it to my attention or the attention of your TA, as soon as possible. Similarly, if you think there might be an error but you're not sure, or you are not sure why you received the mark you received, please don't hesitate to bring it up to myself or your TA for clarification. Fixing a clear grading error (e.g., grader calculation error) does not count as "re-marking". If the TA (or myself) indicates that there was not a grading error, but you disagree with the mark, you may consider submitting a re-marking request to me (Daniel Jeffery).

Remarking of Assignments: Re-marking requests can only be submitted to me (Daniel Jeffery). The TAs are strictly forbidden to accept re-marking requests, so please do not ask them to do so. Any graded work may be submitted by email for re-marking within 2-7 business days of the work being returned (made available) to the student. This means you must take two "cool down" days to review the feedback before seeking a re-marking, but you cannot wait indefinitely. The request must be accompanied by **a written rationale** providing valid, empirical reasons for the request for reappraisal. Be aware that we are strictly forbidden from considering your personal situation when grading; we can only grade based on the merit of the work itself. **Note: re-marking will be done on the assessment as a whole, not just the aspect for which you have an issue. Re-marking can result in the mark being raised, confirmed, or lowered.**

Artificial Intelligence (AI) tools: For this course, you are welcome to utilize AI programs, such as ChatGPT, DALL-E, etc., as learning aids for idea generation, clarification and further exploration of concepts, and as a tool to help you complete your written assignments. However, it is important to exercise caution and critical thinking when using AI-generated content and you should be aware that material generated by AI programs may contain inaccuracies, omissions, or offensive content. It is your responsibility to double-check and verify the information generated to ensure its accuracy and appropriateness, as you will be fully responsible for any work you submit. You should be prepared to explain (verbally or in writing) the meaning behind your work and how you completed it. Remember that AI tools can be used to supplement your learning process, but they should not replace your independent thinking, analysis, and creativity. Put simply, AI-generated content is not explicitly forbidden in your submissions. However, it is essential to thoroughly understand the work being submitted when completing your assessments. There is one exception to this policy, however. The In-Lab Practical Test is open book, open internet, but individual, so you may use any devices and tools at your disposal, except you may not communicate with other people—or AI—for the duration of the test.

Perusall: Some Activities may involve the use of the online tool Perusall for completion and grading. Please follow the below guidelines for the proper use of this tool.

1. *Remain in the Brightspace environment:* Students should not create a separate log in/profile with Perusall and should instead remain in the Learning Management System environment. If they decide to create a full profile, they should review the provider's privacy policy and terms and conditions and avoid linking their social media accounts which may allow for further collection,

uses and disclosures of personal information. If students decide to create separate profiles on the providers' websites, they are proceeding at their own risk.

2. *Limit Personal Information:* Only provide the minimum amount of personal information. Avoid filling out any optional profile fields that request sensitive information such as your address, phone number, date of birth, or profile picture.
3. *Be Mindful of Annotations:* Be cautious when making annotations or comments on readings within Perusall. Do not include personal or sensitive information in your opinions. Remember that your annotations can be visible to others in your class or group and stored by Perusall. Perusall's privacy policy can be found at: https://app.perusall.com/legal/privacy
4. *Adjust Privacy Settings:* Review and adjust your privacy settings with Perusall to control who can view your annotations and comments. If appropriate, consider limiting visibility to only your instructor/Teaching Assistants, if you prefer to keep certain contributions private.

6. Additional Statements

Religious Accommodation
When conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request an accommodation for their absence in writing to the course instructor and/or the Academic Advising office of their Faculty of Registration. This notice should be made as early as possible but not later than two weeks prior to the writing or the examination (or one week prior to the writing of the test).

Please visit the Diversity Calendars posted on our university's EDID website for the recognized religious holidays:

https://www.edi.uwo.ca.

Accommodation Policies
Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic Accommodation_disabilities.pdf

Academic Policies
The website for Registrarial Services is http://www.registrar.uwo.ca

In accordance with policy,

https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf

the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at their official university address is attended to in a timely manner.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers

submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between Western University and Turnitin.com (http://www.turnitin.com).

Professionalism & Privacy:
Western students are expected to follow the Student Code of Conduct. Additionally, the following expectations and professional conduct apply to this course:
☒ All course materials created by the instructor(s) are copyrighted and cannot be sold/shared
☒ Recordings are not permitted (audio or video) without explicit permission
☒ Permitted recordings are not to be distributed
☒ All recorded sessions will remain within the course site or unlisted if streamed

Support Services
Please contact me by email (djeffer4@uwo.ca) if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. Note, all in-person sessions will be recorded for later viewing and all lecture slides will be posted to OWL as early as possible prior to the in-person sessions, if possible. You may also wish to contact Accessible Education at http://academicsupport.uwo.ca/accessible_education/index.html if you have any questions regarding accommodations.

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: https://www.uwo.ca/sci/counselling/

Students who are in emotional/mental distress should refer to Mental Health@Western (https://uwo.ca/health/) for a complete list of options about how to obtain help.

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at

https://www.uwo.ca/health/student_support/survivor_support/get-help.html

To connect with a case manager or set up an appointment, please contact support@uwo.ca

Learning-skills counsellors at the Student Development Centre (https://learning.uwo.ca) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: https://www.uwo.ca/se/digital/

Additional student-run support services are offered by the USC https://westernusc.ca/services/

This course is supported by the Science Student Donation Fund. If you are a BSc or BMSc student registered in the Faculty of Science or Schulich School of Medicine and Dentistry, you pay the Science Student Donation Fee. This fee contributes to the Science Student Donation Fund, which is administered by the Science Students' Council (SSC). One or more grants from the Fund have allowed for the purchase of equipment integral to teaching this course. You may opt out of the Fee by the end of September of each academic year by completing the online form linked from the Faculty of Science's Academic Counselling site. For further information on the process of awarding grants from the Fund or how these grants have benefitted undergraduate education in this course, consult the Chair of the Department or email the Science Students' Council at ssc@uwo.ca

A few examples of equipment used in Bio 3596A/B that has been purchased using SSD funds include: QS3 qPCR machine, PCR machine, Centrifuges, Bio-Rad Gel Doc systems, and Vortexers

Land Acknowledgement

I acknowledge that Western University is located on the traditional lands of the Anishinaabek, Haudenosaunee, Lūnaapéewak and Chonnonton Nations, on lands connected with the London Township and Sombra Treaties of 1796 and the Dish with One Spoon Covenant Wampum. I respect the longstanding relationships that Indigenous Nations have to this land, as they are the original caretakers. I acknowledge historical and ongoing injustices that Indigenous Peoples (First Nations, Métis and Inuit) endure in Canada, and I accept responsibility as part of a public institution to contribute toward revealing and correcting miseducation as well as renewing respectful relationships with Indigenous communities through my teaching, research and community service.

Acknowledgements

This course was designed with the direct support and collaboration of Dr. Anne Simon and Dr. Michelle Belton to ensure course and curriculum consistency. Special thanks to both Anne and Michelle for invaluable discussions and advice, and their generous permission to use their course content.