

MOLECULAR BIOLOGY LABORATORY

Biology 4583F

Course Outline

1. Course Information

Course Information

Molecular Biology Laboratory, Biology 4583F, Fall 2023

Biology 4583F is a laboratory and essay course. The emphasis is on individual, hands-on laboratory experience and honing your ability to communicate your discoveries. Four synchronous hours/week are devoted to this course (1 **in-person** lecture hour, 3 **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: All laboratory sessions will be **in-person**.
- Additional course content and submission of most major assessments will use the **course OWL site**.

List of Prerequisites

A minimum mark of 70% in each of Biology 3596A/B and 1.0 course from: Biology 3466A/B, Biology 3592A/B, Biology 3593A/B, Biology 3594A/B, Biology 3595A/B, Biology 3597A/B, Biology 3598A/B; and registration in year 4 of an Honours Specialization in Genetics or permission of the Genetics Undergraduate Coordinator.

Anti-requisite: The former Biology 4582.

Unless you have either the requisites for this course or written special permission from your Dean 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 in the event that you are dropped from a course for failing to have the necessary prerequisites.

2. Instructor Information

Instructor: Dr. Daniel Jeffery (djeffer4@uwo.ca)

Laboratory Supervisor: Kim Loney (kgrant4@uwo.ca)

Teaching Assistants: Please 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 is 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 "Bio4583" 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 ;)*

Office hours: My office hours will be **in-person (NCB 301B) or by Zoom**, as you prefer, through open scheduling via the Calendly app ([linked here](#)). 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 Syllabus, Schedule, Delivery Mode

Course Description

Project-based inquiry focused on refining the laboratory skills of senior genetics students. Experimental approaches will include analysis of gene expression using modern tools and techniques.

Genetics is a rapidly advancing field of study, with major impacts in a broad number of fields. These developments have changed the way questions and solutions are approached in such diverse areas as agriculture, biotechnology, environmental studies, evolution, forensics, medicine, pharmaceuticals, reproductive biology, and immunology. **The goal of this course is to provide you with the essential molecular biology skills and experience needed to get started as a new member of a research lab in these fields** (and many more) in academia and beyond. Here, you'll get **hands-on experience** with modern molecular biology techniques, expanding on the techniques you learned in Biology 3596, and

practice **reporting your results** and comparing them to the **scientific literature** in the same ways that you would in a research lab.

Course structure

The structure for Bio4583F is similar to Bio3596A/B, as it is also a skills-based course with a heavy workload, combining weekly labs that require pre-lab preparation and post-lab lab book analyses, with weekly lectures to discuss the context of the lab projects and workshop your scientific skills. **Note: most live classes will involve graded Activities. When possible, asynchronous alternatives will be available on the OWL site, but active participation in all live sessions is highly encouraged.** The labs are divided into three main projects that build upon the skills you developed in Bio3596A/B, with each project taking an extra step beyond the experiments you performed in Bio3596A/B. At the end of each project, a report summarizing and integrating the results and interpretation of experiments will be due. You will work in pairs in the lab, but you will need to prepare individual reports, using either whole class data or your own.

Learning outcomes

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

1. Perform modern molecular biology experiments using given protocols, while identifying and troubleshooting potential problems
2. Record experimental methods and results in a manner enabling reproducibility
3. Collaborate effectively and collegially with peers in a laboratory environment and provide constructive criticism to your peers
4. Explain how key modern molecular biology techniques work (including DNA methylation, gene expression/RNA, and CRISPR/Cas9 technologies) and draw conclusions from their results
5. Assess experimental results and conclusions by comparing to scientific literature
6. Clearly communicate molecular biology research findings—in written, oral or multimedia formats—to an academic or lay audience, including preparation of original professional-quality scientific figures
7. Discuss and debate ethical issues related to scientific integrity, reproducibility, and the use of animal models in molecular biology

Key Dates:

Semester begins: Sept 7, 2023 (no lecture or labs this week)

First lecture for the course: Sept 11, 2023

First labs for the course: Sept 12 or 13, 2023 (depending on lab section)

Thanksgiving holiday: Oct 9, 2023 (no lecture, but labs proceed as usual this week)

Fall Reading Week: Oct 28–Nov 5, 2023 (no lecture or labs this week)

Last day to withdraw from the course without academic penalty: Nov 13, 2023

Last labs for the course: Nov 28 or 29, 2023 (depending on lab section)

Last lecture for the course: Dec 4, 2023

Semester ends: Dec 8, 2023 (final submissions)

Exam period: Dec 10–22, 2023 (no exams for this course)

Bio 4583F Schedule Fall 2023

Lecture/Lab	Date	Description	Project		
Week 0	Sept 7/8	No lecture/labs			
Lecture 1	Sep 11	Introduction to Bio4583F and Project 1: DNA methylation	1		
Lab 1	Sep 12 / 13	Project 1: Isolate DNA from mouse liver/brain tissue, quantify & purify DNA			
Lecture 2	Sep 18				
Lab 2	Sep 19 / 20	Project 1: HpaII/MspI digestion of DNA, perform bisulfite treatment using EZ DNA Methylation Lightning Kit → Sci Comm/Research Proposal & Pitch (3%) DUE FRI SEP 22			
Lecture 3	Sep 25				
Lab 3	Sep 26 / 27	Project 1: Purify digests, PCR of <i>Hnf1a</i> on digested & Bis-treated DNA			
Lecture 4	Oct 2	Introduction to Project 2: Quantifying gene expression			
Lab 4	Oct 3 / 4	Project 1: Agarose gel of <i>Hnf1a</i> PCR products, Gel isolation of Bis-treated PCR band, send for sequencing			
No lecture	Oct 9	<i>Thanksgiving holiday</i>			
Lab 5	Oct 10 / 11	Project 2: Nucleic acid isolation from mouse brain sample & DNase treatment		2	
Lecture 5	Oct. 16				
Lab 6	Oct 17 / 18	→ LAB ASSIGNMENT 1 (10%) DUE FRI OCT 20 Project 2: Quality check of RNA in agarose gel, reverse transcription & semi-quantitative PCR of <i>Prdm2</i> gene			
Lecture 6	Oct 23	Introduction to Project 3: Gene knockout with CRISPR Cas9			
Lab 7	Oct 24 / 25	→ Peer Review (6%) DUE FRI OCT 27 Project 2: SYBR qPCR of <i>Prdm2</i> Project 3: Transformation of yeast with two CRISPR plasmids			3
No lecture / labs	Oct 28–Nov 5	<i>Reading Week</i>			
Lecture 7	Nov 6				
Lab 8	Nov 7 / 9	→ Peer Review Rebuttal (3%) DUE FRI NOV 10 Project 2: PAGE of semi-quantitative PCR of <i>Prdm2</i>, TaqMan qPCR of <i>Stx12</i> Project 3: Galactose induction of <i>Cas9</i> *Next morning serial dilution, plating			
Lecture 8	Nov 13				
Lab 9	Nov 14 / 15	Project 3: Genomic DNA isolation from CRISPR mutated yeast, PCR of <i>can1</i> gene			
Lecture 9	Nov 20				
Lab 10	Nov 21 / 22	→ LAB ASSIGNMENT 2 (15%) DUE FRI NOV 24 Project 3: Agarose gel of <i>can1</i> PCR, isolate DNA from agarose, send DNA for sequencing			
Lecture 10	Nov 27				
No labs	Nov 28 / 29	→ In-lab practical test (18%) → Sci Comm/Research Proposal Submission & Presentation (9%) DUE FRI DEC 1			
Lecture 11	Dec 4				
No labs	Dec 5 / 6	No labs this week → LAB ASSIGNMENT 3 (20%) DUE FRI DEC 8			
Exam period	<i>Dec 10–22</i>	<i>No exams for this course.</i> 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, except that the In-Lab Practical Exam will need to be cancelled, with the marks re-weighted equally across the three Lab Assignments. 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, safety goggles and hard-bound lab notebook. Lecture notes, laboratory outlines, protocols and associated readings will all be posted weekly on the OWL course website. These postings will be attached into your purchased hard-bound lab notebook prior to your attendance to a lab.

Laboratory Manual

- A laboratory manual outlining all experiments will be available through the course OWL website, in Word and/or PDF 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 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: <http://owl.uwo.ca>

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 (x3)	1) DNA methylation—Fri Oct 20, 11:55pm	10%
	2) Mouse gene expression—Fri Nov 23, 11:55pm	15%
	3) CRISPR—Fri Dec 8, 11:55pm	20%
Peer Review	Fri Oct 27, 11:55pm	6%
Peer Review Rebuttal	Fri Nov 10, 11:55pm	3%
Science Communication OR Mini-Research Proposal	Proposal & Pitch—Fri Sept 22, 11:55pm	3%
	Submission & Presentation—Fri Dec 1, 11:55pm	9%
Lab Book	Throughout (due one week after each lab)	10%
In-lab Practical Exam	Nov 28 or 29 (according to your Lab Section)	18%

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

Essential course requirements

Course-specific conditions that are required to pass the course are:

1. Minimum 70% attendance of all laboratory sessions (7 of 10)
2. Submission of all three Lab Assignments and Lab Book, with an average greater than 50% across the three Lab Assignments
3. Completion of the In-lab Practical Exam

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 assignment or miss too many labs due to illness or other serious circumstances (see Student Absences below), 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) until you complete the course requirements.

Scheduling Conflicts: Assessment due dates have been structured to distribute your workload over the term and have been timed to coordinate with the course activities to allow timely formative feedback applicable for later assessments. Valid scheduling conflicts must be brought to my attention at least **one week prior** so that alternative arrangements can be made.

Late Submissions: All assessments, with the exception of the In-Lab Practical Exam, can be submitted up to 3 days (72h) after the due date but will have 10% deducted per day (i.e., -10% if 1-24h late, -20% if 25-48h late, -30% if 49-72h late). Thereafter, they will be considered “Not Submitted” and receive a grade of zero. However, I recognize that fluke problems may happen, so **you will be allowed to hand in up to two assessments up to 24 hours late without penalty. No explanation or documentation will be required.** Late penalties (and application of the two 24h grace periods) will be automatically applied at the end of term. In case of multiple late submissions, the grace periods will be applied to the highest weighted assessments. Both grace periods can be applied to the same assessment (e.g., in case you submit only one assignment 48h late).

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** (djeffer4@uwo.ca) for re-marking within 5 business days of the work being returned (made available) to the student. 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 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.

6. Student Absences

If you are unable to meet a course requirement due to illness or other serious circumstances—even after taking into account the above Late Submissions policy for assessments—please follow the procedures below.

General policy for missed course components due to illness or other serious circumstances:

Please contact me by email (djeffer4@uwo.ca) to explain the situation, **as soon as possible** within 5 days of the course component completion/due date. Note, this information is meant to help me provide better support by keeping me informed about issues that students may be facing, you are not obligated to go into detail or provide information you're uncomfortable sharing. **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 your academic counsellor (see below).

For assessments worth less than 10% of the overall course grade:

Please inform me as described above. Usually, documentation will not be required (medical or otherwise). After reviewing your email, I will suggest possibilities for re-weighting, as needed.

For assessments worth 10% or more of the overall course grade:

Please inform me as described above. In addition, according to university policy, academic considerations for work totalling 10% or more of the final course grade can be granted only by the student's Faculty of Registration (typically your academic counsellors). Therefore, you must also provide valid medical or supporting documentation to the Academic Counselling Office of your Faculty of Registration as soon as possible. Upon approval from the Academic Counselling Office, an extension of 7 days after you recover, and/or a make-up assessment (if necessary), will be provided.

- For further information, please consult the University's medical illness policy at https://uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration.pdf.
- The Student Medical Certificate is available at https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf.
- For more information about Academic Consideration: https://registrar.uwo.ca/academics/academic_considerations/index.html
- Academic Advising for each of the faculties can be found here: https://registrar.uwo.ca/faculty_academic_counselling.html

For missed labs:

Please inform me as described in the general policy above. Accommodations will be made with the lab coordinator and your lab TA to ensure you can participate in subsequent labs, if applicable. Virtual labs and/or data may be provided as a make-up option or to enable you to complete the associated Lab Report.

*If the missed labs impinge on your ability to complete the associated Lab Assignment by the deadline, you will need to follow the guidelines above for assessments worth 10% or more. An extension of up to 7 days for the associated Lab Assignment may be provided, if deemed necessary.

For ≥4 missed labs:

Please follow the guidelines for assessments worth 10% or more. If approved, you will be given the opportunity to complete the labs and associated Lab Report(s) with the next offering of the course, in which case you will receive a grade of Incomplete (INC) until completed.

Absences from Final Examinations

If you miss the Final Exam (In-Lab Practical Exam), please contact the Academic Counselling office of your Faculty of Registration as soon as you are able to do so. They will assess your eligibility to write the Special Examination (the name given by the University to a makeup Final Exam).

You may also be eligible to write the Special Exam if you are in a “Multiple Exam Situation” (e.g., more than 2 exams in 23-hour period, more than 3 exams in a 47-hour period).

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See the Academic Calendar for details (under Special Examinations).

7. Accommodation and Accessibility

Religious Accommodation

When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at

<https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>

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

8. 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 The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

9. 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 synchronous Zoom sessions will be recorded for later viewing and all lecture slides will be posted to OWL as early as possible prior to synchronous sessions. 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 4583F that has been purchased using SSD funds include: QS3 qPCR machine, PCR machine, Centrifuges, Bio-Rad Gel Doc systems, and Vortexers

10. Acknowledgements

This course was designed with the direct support and collaboration of Dr. Anne Simon and Dr. Michelle Belton, in order 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.