

**Bio3593B Course Outline****1. Course Information****Course Information**

BIO 3593B: Genetic Engineering, FW25

**2. Instructor Information**

Full name, title and appropriate contact information of the instructor and, if the course is taught by more than one instructor, the name of the person responsible for the course (course coordinator).

Instructors	Email	Office	Office Hours
Lecturer: Jorden Maglov (she/her)	jmaglov@uwo.ca		By request
TA: George Del Grosso (he/him)	gdelgros@uwo.ca		

Students must use their Western (@uwo.ca) email addresses when contacting their instructors.

**3. Course Syllabus, Schedule, Delivery Mode**

**Aim:** This course will present techniques and approaches currently in use in primarily plant biotechnology with the aim to enhance synthesis of concepts presented in prerequisite courses and their operational use, develop critical thinking in the framework of agricultural genetics/genomics, and empower students in knowledge-based problem solving. Lectures will be primarily aimed toward discussions of the course material, fostering knowledge synthesis/concept development/critical thinking. During tutorials, students give an oral presentation based on a primary research paper chosen from scientific journals. Besides being used to broaden the number of examples of the use of genetic engineering in research and biotechnology, the tutorials provide students the opportunity to develop oral presentation skills. Tutorials are mandatory.

**Expected learning outcomes:**

By the end of this course:

- Students will have a working knowledge of the approaches and tools used in agricultural biotechnology
- Students will be able to apply these approaches and tools in novel situations/problems
- Read and understand genetic and biotechnology primary scientific literature

**Lecture Topics:**

Genome structure (chromatin, genome complexity, gene families, gene structure)

Building a transgene:

- Transcriptional regulation of gene expression
- Translational regulation of gene expression

- Copy number of transgene, positional effects
- Selection of promoters, UTRs, terminators, selectable markers
- Targeting of the foreign protein
- Stability of the foreign protein
- Expression of the transgene
- Methods, tools and technology commonly used in genetic engineering
- Transformation of transgene into a plant host
  - Binary vector systems
  - Agrobacterium-mediated transformation
  - Alternative transformation methods
  - Molecular characterization of transgenes
- Gene silencing technologies in plants
  - Antisense RNA technology
  - RNAi
  - Virus-induced gene silencing
- Genome editing
  - CRISPR-Cas systems
  - Guide RNA design
- Proteins as products
  - Plants as bio factories
  - Recombinant protein expression
  - Transient expression via Agroinfiltration
  - Case studies in molecular farming
- Case studies: Genetic manipulation of herbicide, pest, and disease resistance

#### **IMPORTANT DATES:**

Classes begin: January 5, 2026  
Reading Week: February 14 – 22, 2026  
Classes end: April 9, 2026  
Exam period: April 12 – 30, 2026

#### **Contingency plan**

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.

#### **4. Course Materials**

**Text:** Plant Biotechnology: The Genetic Manipulation of Plants,  
**Adrian Slater, Nigel W Scott, and Mark R Fowler**

- TEXT BOOK and supplementary materials delivered through OWL contain ALL information necessary to successfully answer exam questions

- LECTURES will be primarily aimed toward discussions of the course material, fostering knowledge synthesis/concept development/critical thinking

Students are responsible for checking the course OWL site (<http://owl.uwo.ca>) 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.

All course material will be posted to OWL: <http://owl.uwo.ca>.

If students need assistance with the course OWL site, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

## 5. Methods of Evaluation

Seminar Presentation: 15% (**groups of 3 students**, presentations during tutorials), **starting January 15**

Midterm test: 25%, FEB 12, in class

Final exam: 40%, TBD

Group short written assignment: 15% (**groups of 6 students**, due by April 3rd)

Participation: 5% (*attendance* at tutorials and participation to discussions)

### 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](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/](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:

- **Examinations scheduled during official examination periods** (Defined by policy)
- **Midterm/Presentation/Group Project** (Designated by the instructor as the one assessment that always requires documentation when requesting Academic Consideration)

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.

## 6. Student Absences

Instructors are encouraged to arrange participation requirements and multiple small assignments in such a way as to allow students some flexibility (e.g., by grading based on the best  $n-2$  of  $n$  quizzes or assignments) to reduce the number of requests for academic considerations and consequent burden on both instructors and academic counsellors. Where academic considerations are required, the student should be given clear direction.

If you are unable to meet a course requirement due to illness or other serious circumstances, please follow the procedures below.

### Assessments worth less than 10% of the overall course grade:

For work worth less than 10% of the total course grade, the instructor is empowered to grant academic considerations without referring the student to their academic counsellors. If an instructor chooses to do so, the mechanism for dealing with missed work (e.g., an extension, make-up opportunity, or reweighting) must be specified on the course outline to ensure fair treatment for all students. Note that in all cases where documentation (medical or otherwise) is required, it can *only* be collected by the student's Dean's Office Academic Counselling unit.

### Assessments worth 10% or more of the overall course grade:

By 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 by their academic counsellors). In such cases, students should be directed as follows.

For work totalling 10% or more of the final course grade, you must provide valid medical or supporting documentation to the Academic Counselling Office of your Faculty of Registration as soon as possible. For further information, please consult the University's medical illness policy at

[https://uwo.ca/univsec/pdf/academic\\_policies/appeals/academic\\_consideration.pdf](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](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf).

## Absences from Examinations

**Missed mid-term examination:** A student who misses the midterm exam for a valid reason must provide documentation through the Deans office. There is no make-up exam. ***A cumulative final exam***

***will be written.***

<https://studentservices.uwo.ca/secure/index.cfm>

If you miss the **Final 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).

**Note:** missed work can *only* be excused through one of the mechanisms above. Being asked not to attend an in-person course requirement due to potential COVID-19 symptoms is **not** sufficient on its own.

## **6. 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](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf).

## **7. 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](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.

No electronic devices will be permitted on tests and exams.

**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](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf).

## 8. Support Services

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](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](mailto:support@uwo.ca).

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Accessible Education at

[http://academicsupport.uwo.ca/accessible\\_education/index.html](http://academicsupport.uwo.ca/accessible_education/index.html)

if you have any questions regarding accommodations.

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/>.