

## Bio4515 Course Outline

### 1. Course Information

#### Course Information

**Biology 4515: Genome biology: genome sequencing, genome annotation and genome interactions, FW23**

### 2. Instructor Information

Instructors	Email	Office	Phone	Office Hours
Prof. Vojislava Grbic	vgrbic@uwo.ca	WSC341	x86898	In person

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

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

**Overview:** The aim of this course is to present concepts, techniques and approaches that represent basis for modern genomics. We will focus on the power of genomics and whole genome sequencing as a tool to understand various biological questions including whole genome regulation, expression and interactions between different genomes and discuss experimental designs in genomics. Students will be familiarized with genome sequencing strategies (ranging from Sanger to Illumina and long range sequencing using Oxford Nanopore and PacBio systems), genome annotation and concepts and approaches used for the development of whole genome sequencing using the two spotted spider mite *Tetranychus urticae*; <http://www.jgi.doe.gov/sequencing/why/50028.html> as an example. The course will be based on lectures, data analysis, student presentations and preparation of the research proposal. The material for the course includes analysis of primary literature in area of genomics.

Classes begin: January 8, 2024

Fall Reading Week: February 17 – 25, 2024

Classes end: April 8, 2024

Exam period: April 11 – 30, 2024

**Lectures:** There will be a combination of formal lectures (to be given by V. Grbic and guest lecturers) and student presentations.

#### Program:

Jan. 11 Introduction: Genomic technologies

Jan. 18, 25 Development of genomics tools

Genome sequencing: from biological problem to the whole genome sequence, example *T. urticae*

Feb. 1 Detailed technical demonstration: database use, phylogenomic programs, sequence aligning, data presentation, selection of genes for poster presentation

Feb. 8 Poster presentation training session: technical questions, answers and demonstrations

**FEBRUARY 14: ALL POSTERS DUE IN THE ELECTRONIC FORM (to be submitted via OWL)**

**Feb. 15 Poster presentations (allow a bit longer period), location TBA**

Feb 28-March 28 Case studies and student presentations

Examples:

- Analysis of gene expression
- Comparative genomics
- Metabarcoding/metagenomics
- Single cell/spatial transcriptomics
- Population genetics
- Identification of structural changes in the genome

This segment will be based on required reading of the review article (all students), test of the understanding of the basic concept(s) presented in the review article (all students, 10% of the grade), presentation of the primary research articles (two students, 30% of the grade)

Apr. 4 Recap and preparation for the proposal

**APRIL 27: PROPOSALS DUE IN THE ELECTRONIC FORM (to be submitted via OWL)**

### **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:** There is no text for this course as we will be covering material from the primary literature.

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

### **Evaluation:**

poster (30%), individual assignment  
oral presentation (30%), individual assignment  
written essay (proposal) (30%), individual assignment  
quizzes (10%), individual assignment

## 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).

**Missed examination:** A student who misses the midterm exam for a valid reason must provide documentation through the Deans office. **A cumulative final exam will be written.**

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

## **Absences from Final Examinations**

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/>.