

[Department of Medical Biophysics]
[Disease Biomarkers and Precision Medicine, MBP 4730A]

Course Syllabus for Fall 2022



Western University is committed to a **thriving campus**; therefore, your health and wellness matter to us! The following link provides information about the resources available on and off campus to support students: <https://www.uwo.ca/health/> Your course coordinator can also **guide you** to resources and/or services should you need them.

1. Technical Requirements:



Stable internet connection



Laptop or computer



Working microphone



Working webcam

Please Note: Due to uncertainty around COVID-19, students must have a reliable internet connection and computer with working microphone and webcam that are compatible with online learning.

2. Important Dates:



Classes Begin	Classes End	
Friday, September 9, 2022	Wednesday, December 7, 2022	
* November 12, 2022: Last day to drop a first-term half course without academic penalty		
Reading Week	Study day(s)	Exam Period
October 31–November 6	December 9	December 10–22

3. Contact Information



Course Coordinator	Contact Information
Dr. Krishna Singh	Krishna.singh@uwo.ca
Instructor(s) or Teaching Assistant(s)	Contact Information
Ms. Shuhan Bu	Sbu4@uwo.ca

4. Course Description and Design

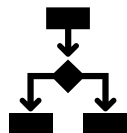
Delivery Mode: In-person; blended

Description: This course focuses on various modern molecular genetic research approaches, model systems, experimental designs, and analytical methods used to identify disease biomarkers and their use in precision medicine for improved health outcomes. Examples will be taken from cardiovascular diseases and cancer, and latest biomarker/precision medicine-related outcomes.

Pre-requisites: Registration in Year 4 of a BSc or BMSc degree and one of the following courses: Biochemistry 3380G, Medical Biophysics 3970Z, Medical Sciences 3990E, Microbiology and Immunology 3610F, Microbiology and Immunology 3620G, Physiology and Pharmacology 3000E. Biochemistry 2280A.

Corequisite(s): None

Pre-or Corequisite(s): None.



Timetabled Sessions

Component	Date(s)	Time	Location
Lecture	M/F	8.30 AM – 9.30 AM	MSB – M384
Tutorial	W	8.30 AM – 9.30 AM	TBA

- Attendance at sessions is required
- Missed work should be completed within 24 hours

All course material will be posted to OWL: <http://owl.uwo.ca>. Any changes will be indicated on the OWL site and discussed with the class.

If students need assistance, 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.

[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](#).

5. Learning Outcomes

Upon successful completion of this course, students will be able to:

- explain value, contributions, and limitations of basic research and applied research,
- explain and differentiate between different types of biomarkers,
- discuss the applications of basic molecular and genetic concepts in disease biomarker identification,
- design and recommend the choice of biomarker source material, and select methods to identify biomarkers for specific diseases,
- critically appraise the strengths and limitations of the biomarkers in clinical practice today,
- relate basic molecular genetic concepts to precision medicine,
- develop scientific writing and oral presentation skills, and develop communication skills to discuss new ideas and opposing opinions with peers in direct interactions and via online communication tools.



6. Course Content and Schedule (Subject to change)

Week (Dates)	Lecture Topic	Instructor	Tutorial/Assignments
1 (Sept 8–11)	Meet-and-greet; introduction to the subject and expectations	Dr. Krishna Singh	No tutorial
2 (Sept 12–18)	Central Dogma of Molecular Biology – DNA, RNA and Protein (refresher)	Dr. Krishna Singh	No tutorial / Assignment I released
3 (Sept 19–25)	Mechanisms of Diseases I - Genetic mutation	Dr. Krishna Singh	TA-assist individual assignment
4 (Sept 26–Oct 2)	Mechanisms of Diseases II - miRNA, protein modification/stability/folding	Dr. Krishna Singh	TA-assist individual assignment / Assignment I due
5 (Oct 3–9)	Models of Diseases - Cells and Animal models	Dr. Krishna Singh	TA-led mid-term Preparation
6 (Oct 10–16)	Disease Biomarkers I - Types, characteristics, & biomarker performance	Dr. Krishna Singh	MID TERM EXAM (Weeks 1-5)
7 (Oct 17–23)	Disease Biomarkers II - Discovery – challenges and approaches	Dr. Krishna Singh	No tutorial / Assignment II released
8 (Oct 24–Oct 30)	Disease Biomarkers III – Molecular Biology Tools - Genomics	Dr. Krishna Singh	TA-assist group assignment II
9 (Oct 31–Nov 6)	Reading Week	N/A	
10 (Nov 7–13)	Disease Biomarkers IV – Molecular Biology Tools - Proteomics	Dr. Krishna Singh	TA-assist group assignment II
11 (Nov 14–20)	Disease Biomarkers V – Cytogenetics	Dr. Krishna Singh	Group assignment II – Draft due
12 (Nov 21–27)	Disease Biomarkers VI – Molecular Imaging	Dr. Krishna Singh	TA-assist group assignment II
13 (Nov 28–Dec 4)	Disease Biomarkers VII – Discovery to Delivery	Dr. Krishna Singh	Assignment due
14 (Dec 5–8)	Precision Medicine & its application	Dr. Krishna Singh	TA-led Final exam preparation



7. Participation and Engagement



- Students are expected to participate and engage with content as much as possible
- Students can participate during lectures and tutorials
- Students can also participate by interacting in the forums with their peers and instructors

8. Evaluation

Below is the evaluation breakdown for the course. Any deviations will be communicated.

Assessment	Format	Weighting	Due Date
Assignment 1	Written – individual report	15%	September 30, 2022
Assignment 2	Video production and class presentation (group)	10% draft/storyboard for video 20% final video	December 2, 2022
Midterm Test	Written (25% multiple choice, 75% short answer; in class 50 minutes)	25%	October 12, 2022
Final Examination	Written (Cumulative, 2 hours, 100% short answer)	30%	TBA

- All assignments are due at 11.55PM EST unless otherwise specified
- Students are responsible for ensuring that the correct file version is uploaded; incorrect submissions including corrupt files could be subject to late penalties (see below) or a 0
- Written assignments will be submitted to Turnitin (statement in policies below)
- Rubrics will be used to evaluate assessments and will be posted with the instructions
- A student might not receive the same grade as their group members if it is determined that the distribution of work was not equal
- After an assessment is returned, students should wait 24 hours to digest feedback before contacting their evaluator; to ensure a timely response, reach out within 7 days
- Any grade appeals on assignments, quizzes, or midterms must be received within 2 weeks of the grade being posted.



Click [here](#) for a detailed and comprehensive set of policies and regulations concerning examinations and grading. The table below outlines the University-wide grade descriptors.

90-100	One could scarcely expect better from a student at this level
80-89	Superior work which is clearly above average
70-79	Good work, meeting all requirements, and eminently satisfactory
60-69	Competent work, meeting requirements
50-59	Fair work, minimally acceptable
below 50	Fail

Information about late or missed evaluations:

- Late assessments without accommodation will be subject to a late penalty ___ 10%/day
- An assessment cannot be submitted after it has been returned to the class; in cases where valid reasons are presented to the instructor reweighting assessment item will be considered
- A missed test cannot be made up, but with self-reported or documented absence the weight of a missed test will be transferred to the final exam
- Final exam must be passed to pass the course. If the final exam is not passed, the student can complete it the next time the course is offered.

INC (Incomplete Standing): If a student has been approved by the Academic Counselling Office (in consultation with the instructor/department) to complete term work at a later date, an INC will be assigned. Students with INC will have their course load in subsequent terms reduced

to allow them to complete outstanding course work. Students may request permission from Academic Counselling to carry a full course load for the term the incomplete course work is scheduled.

SPC (Special examination): If a student has been approved by the Academic Counselling Office to write a Special Examination and the final exam is the only outstanding course component, an SPC will be assigned. If the class has a makeup exam, the student is expected to write the makeup exam. If the class doesn't have a makeup exam or the student misses the makeup exam for reasons approved by the Academic Counselling Office, the student will write the exam the next time the course is offered. Outstanding SPCs will reduce the course load for the term the exam is deferred as outlined in [Types of Examinations](#) policy.

9. Communication:



- Students should check the OWL site every 24–48 hours
- Students should email their instructor(s) and teaching assistant(s) using email.
- Emails will be monitored daily; students will receive a response in 24–48 hours
- This course will use forum for discussions

10. Office Hours:



- Office hours will be held in-person or remotely using zoom
- Office hours will be held date and time TBD
- Office hours will be drop in
- Office hours will be individual or group

11. Resources



- All resources will be posted in OWL
- Optional course reading
Molecular Biology of the Cell. 6th or further Edition

12. 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 (e.g., Must Knows Facebook group, Course Hero, Chegg, etc.)
- Recordings are not permitted (audio or video) without explicit permission
- Permitted recordings are not to be distributed
- Students will be expected to take an academic integrity pledge before some assessments

Western is committed to providing a learning and working environment that is free of harassment and discrimination. All **students**, staff, and faculty have a role in this commitment and have a responsibility to ensure and promote a safe and respectful learning and working environment. Relevant policies include Western's [Non-Discrimination/Harassment Policy](#) (M.A.P.P. 1.35) and [Non-Discrimination/Harassment Policy – Administrative Procedures](#) (M.A.P.P. 1.35).

Any **student**, staff, or faculty member who experiences or witnesses' behaviour that may be harassment or discrimination **must report the behaviour** to the Western's [Human Rights Office](#). Harassment and discrimination can be human rights-based, which is also known as EDI-based, (sexism, racism, transphobia, homophobia, islamophobia, xenophobia, antisemitism, and ableism) or non-human rights-based (personal harassment or workplace harassment).

13. How to Be Successful in this Class:

Students enrolled in this class should understand the level of autonomy and self-discipline required to be successful.



1. Invest in a planner or application to keep track of your courses. Populate all your deadlines at the start of the term and schedule your time throughout the course.
2. Make it a daily habit to log onto OWL to ensure you have seen everything posted to help you succeed in this class.
3. Follow weekly checklists created on OWL or create your own to help you stay on track.
4. Take notes as you go through the lesson material. Keeping handwritten notes or even notes on a regular Word document will help you learn more effectively than just reading or watching the videos.
5. Connect with others. Try forming an online study group and try meeting on a weekly basis for study and peer support.
6. Do not be afraid to ask questions. If you are struggling with a topic, check the online discussion boards or contact your instructor(s) and or teaching assistant(s).
7. Reward yourself for successes. It seems easier to motivate ourselves knowing that there is something waiting for us at the end of the task.

14. Western Academic Policies and Statements

Absence from Course Commitments

A. Absence for medical illness:

Students must familiarize themselves with the [Accommodation for Illness Policy](#).

A student seeking academic accommodation for any **work worth less than 10%** must contact the instructor or follow the appropriate Department or course specific instructions provided on the course outline. Instructors will use good judgment and ensure fair treatment for all students when considering these requests. You are not required to disclose details about your situation to your instructor; documentation is not required in this situation, and you should not send any pictures to your instructor.

If you are unable to meet a course requirement for any **work worth 10% or greater** due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to the Academic Counseling as soon as possible and contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed. Please note that the format of a make-up test, exam, or assignment is at the discretion of the course coordinator.

A student requiring academic accommodation due to illness should use the Student Medical Certificate when visiting an off-campus medical facility or request a Record's Release Form (located in the Dean's Office) for visits to Student Health Services. The form can be found at: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf

B. Absence for non-medical reasons:

Student absences might also be approved for non-medical reasons such as religious holidays and compassionate situations. Please review the policy on [Accommodation for Religious Holidays](#). All non-medical requests must be processed by Academic Counselling. Not all absences will be approved; pay attention to the academic calendar and final exam period when booking any trips.

C. Special Examinations

A Special Examination is any examination other than the regular examination, and it may be offered only with the permission of the Dean of the Faculty in which the student is registered, in consultation with the instructor and Department Chair. Permission to write a Special Examination may be given on the basis of compassionate or medical grounds with appropriate supporting documents. To provide an opportunity for students to recover from the circumstances resulting in a Special Examination, the University has implemented Special Examinations dates. These dates as well as other important information about examinations and academic standing can be found [here](#).

Academic Offenses

Scholastic offences are taken seriously, and students are directed [here](#) to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence.

Accessibility Statement

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Accessible Education (AE) at 661-2111 x 82147 for any specific question regarding an accommodation or review [The policy on Accommodation for Students with Disabilities](#)

Correspondence Statement

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 his/her official university address is attended to in a timely manner. You can read about the privacy and security of the UWO email accounts [here](#).

Discovery Credit Statement

Students are permitted to designate up to 1.0 Discovery Credit course (or equivalent) for pass/fail grading that can be counted toward the overall course credits required for their degree program. The details of this policy and the deadlines can be found [here](#).

Turnitin and other similarity review software

All assignments will be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. Students will be able to view their results before the final submission. 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](#).

15. BMSUE Academic Policies and Statements

Cell Phone and Electronic Device Policy (for in-person tests and exams)

The Schulich School of Medicine & Dentistry is committed to ensuring that testing and evaluation are undertaken fairly across all our departments and programs. For all tests and exams, it is the policy of the School that any electronic devices, i.e., cell phones, tablets, cameras, or iPod are strictly prohibited. These devices **MUST** be left either at home or with the student's bag/jacket at the front of the room and **MUST NOT** be at the test/exam desk or in the individual's pocket. Any student found with one of these prohibited devices will receive a grade of zero on the test or exam. Non-programmable calculators are only allowed when indicated by the instructor. The program is not responsible for stolen/lost or broken devices.

Copyright and Audio/Video Recording Statement

Course material produced by faculty is copyrighted and to reproduce this material for any purposes other than your own educational use contravenes Canadian Copyright Laws. You must always ask permission to record another individual and you should never share or distribute recordings.

Rounding of Marks Statement

Across the Basic Medical Sciences Undergraduate Education programs, we strive to maintain high standards that reflect the effort that both students and faculty put into the teaching and learning experience during this course. All students will be treated equally and evaluated based only on their actual achievement. **Final grades** on this course, irrespective of the number of decimal places used in marking individual assignments and tests, will be calculated to one decimal place and rounded to the nearest integer, e.g., 74.4 becomes 74, and 74.5 becomes 75. Marks **WILL NOT** be bumped to the next grade or GPA, e.g., a 79 will **NOT** be bumped up to an 80, an 84 **WILL NOT** be bumped up to an 85, etc. The mark attained is the mark you achieved, and the mark assigned; requests for mark "bumping" will be denied.

16. Support Services

The following links provide information about support services at Western University.

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.

[Academic Counselling \(Science and Basic Medical Sciences\)](#)

[Appeal Procedures](#)

[Registrarial Services](#)

[Student Development Services](#)

[Student Health Services](#)