

Department of Medical Biophysics
Applied Medical Imaging; MEDBIO 4720B

Course Syllabus for Winter 2023



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

2. **Important Dates:**



Classes Begin	Classes End
Monday, January 9, 2023	Monday, April 10, 2023

* March 7, 2023: Last day to drop a second-term half course without penalty

Reading Week	Study day(s)	Exam Period
February 18–26	April 11-12	April 13-30

3. **Contact Information**



Course Coordinator	Contact Information
Jefferson Frisbee, PhD	jfrisbee@uwo.ca

Instructor(s) or Teaching Assistant(s)	Contact Information
Sean McRae (Graduate Teaching Assistant)	smcrae24@uwo.ca
Elizabeth Oliveira (Academic Program Coordinator; Medical Biophysics)	askmbp@schulich.uwo.ca
Matthew Teeter, PhD	mteeter@robarts.ca
Aaron So, PhD	aso@robarts.ca
Ian Cunningham, PhD	icunnin@uwo.ca
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Jonathan Thiessen, PhD	jthiessen@lawsonimaging.ca

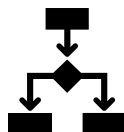
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Katherine Zukotynski, MD	TBD
Narinder Paul, MD	narinder.paul@lhsc.on.ca

4. Course Description and Design

Delivery Mode: This course is intended to be delivered live (in person), with a weekly in-person GTA-directed tutorial session.

This course will present the major modalities of medical imaging (e.g., MR, PET, CT, etc.) from a conceptual perspective. Clinical correlate lectures will be used as follow ups to provide applications to real world pathological conditions and to understanding the benefits of those modalities for guiding clinical diagnosis/improving health outcomes.

Prerequisite(s): Registration in Year 4 of a BSc or BSc degree and one of the following: Biochemistry 3380G, Medical Biophysics 3970Z, Medical Sciences 3990E, Microbiology and Immunology 3610F, Microbiology and Immunology 3620G, Physiology and Pharmacology 3000E. One of Physics 1202A/B, 1502A/B, the former Physics 1029A/B, the former Physics 1302A/B is recommended.



Timetabled Sessions

Component	Date(s)	Time
Lectures	Tuesday/Thursday	15:30 – 16:20 PM
Tutorial	Friday	16:30 – 17:20 PM

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:

- demonstrate a thorough knowledge of the basic biophysical concepts for medical imaging techniques in use in a modern clinical setting
- compare and contrast the major differences between the medical imaging techniques presented in the course
- discuss the strengths and limitations of the major medical imaging techniques in clinical practice today
- explain why different modalities of medical imaging are preferred in different clinical settings and how the information derived is applied to improve clinical outcomes



6. Course Content and Schedule

Week	Topic	Instructor	Instructor	Tutorial
Jan 9	Introduction (Tues) X-Ray Imaging Basic (Thurs)	Frisbee (course intro; 1/10)	Teeter (1/12)	GTA (1/13)
Jan 16	X-Ray Imaging Clinical Correlate (Tues, Thurs)	Sathiadoss (1/17)	Wang (1/19)	GTA (1/20)
Jan 23	Fluoro C arm and CT Basic (Tues) CT Clinical Correlate (Thurs)	So (1/24)	Goela (1/26)	GTA (1/27)
Jan 30	Fluoro Clinical Correlate (Tues) Dual Energy Contrast Enhancement Basic (Thurs)	Cardarelli Leite (1/31)	Cunningham (2/1)	GTA (2/2)
Feb 6	Angiography Clinical Correlate (Tues) MR Imaging Basic (Thurs)	Mujoomdar (2/7)	Scholl (2/9)	GTA (2/10)
Feb 13	MR Imaging Clinical Correlate – Cardiac (Tues) Assignment 1 (Thurs)	Ahmed (2/14)	Frisbee (in class midterm exam, 2/16)	GTA (2/17)
Feb 18 - 26	Reading Week, no classes	n/a	n/a	n/a
Feb 27	PET Basic (Tues) PET Clinical Correlate (Thurs)	Thiessen (2/28)	Zukotynski (3/2)	GTA (3/3)
March 6	Molecular Imaging Basic (Tues) Molecular Imaging Clinical Correlate (Thurs)	Foster (3/8)	Laidley (3/10)	GTA (3/11)
March 13	US Imaging Basic (Tues) US Imaging Clinical Correlate (Thurs)	Fenster (3/15)	Cool (3/17)	Frisbee (in class midterm exam, 3/18)
March 20	US Guided Radiotherapy (Tues) MRI SIM Basic (Thurs)	Mendez (3/21)	Mattonen (3/23)	GTA (3/24)
March 27	MRI SIM Clinical Correlate (Tues) Neurorad Diagnostic/Functional Basic (Thurs)	Lang (3/28)	Menon (3/30)	GTA (3/31)
April 3	Neurorad Diagnostic/Functional Clinical Correlate (Tues) Neurorad Interventional (Thurs)	Cherpak (4/4)	Dmytriw (4/6) <i>Tutorial with GTA to follow</i>	Western closed
April 10	NO CLASSES			

7. Participation and Engagement



- Students are expected to participate and engage with content as much as possible
- Students are expected to actively participate in the main lectures through engaging with questions with both the “basic science” and “clinical correlate” instructors
- Students can also participate by interacting in the tutorial sessions 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
Midterm 1	Written, in class	32.50%	2/13; end of class
Midterm 2	Written, in class	32.50%	3/18; end of class
Final Exam	Written, scheduled by Registrar	35.00%	TBD

- All Midterms are due at the close of the class or exam session unless otherwise specified
- Any grade appeals on Midterms must be received within 3 weeks of the grade being posted.
- 15% of your course grade will be evaluated and returned 3 days prior to the drop deadline (statement in policies below).

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:

- If a student receives academic consideration for a missed midterm then there will be one opportunity to write each make-up exam. The default date is the Tutorial period following the missed midterm.
 - In the case of a missed make-up midterm exam, a student granted academic consideration will receive INC and must complete the midterm for the next offering of the course otherwise they will receive a zero grade for the mid-term mark.
- Students who are granted academic consideration for a missed Final Exam, will be given permission to write a Special Examination as scheduled by the University.
 - Students who miss a Special Examination and are granted academic consideration for the absence, will receive an INC and must complete the Final Exam for the next offering of the course otherwise they will receive a grade of “0” (“zero”) for Final Exam mark.
- A student who is not granted academic consideration for a missed mid-term, Final Exam or a Special Examination, will receive a grade of ‘0’ (‘zero’) for the evaluation.
- Students are advised that the Make-up Midterm Exams, and Special Examination may take an alternate format to the regular scheduled examination.

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 the Course Director and Graduate Teaching Assistant using email addresses provided above
- Emails will be monitored daily; students will receive a response in 24–48 hours
- This course will use in-person meetings for tutorial sessions

10. Office Hours:



- Office hours can be done as individual or group sessions.
- Most office hours will be by email request followed by Zoom discussions or in-person sessions (at the discretion of the GTA)

11. Resources



- All resources will be posted in OWL
- No required textbook
- No required study guide

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. 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.

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

[Appeal Procedures](#)

[Registrarial Services](#)

[Student Development Services](#)

[Student Health Services](#)