

Interdisciplinary Medical Sciences

MEDSCIEN 3990E and 3991F: IMS Laboratory

Course Outline for Fall-Winter 2022-2023



As we build towards returning to a more typical academic year, Western University is committed to a **thriving campus**. We encourage you to check out the [Digital Student Experience](#) website to manage your academics and well-being. Additionally, the following link provides available resources to support students on and off campus: <https://www.uwo.ca/health/>.

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Technical Requirements



Stable internet connection



Laptop*



Working microphone**



Working webcam**

**Some laboratory sessions require the use of a personal laptop with WiFi capabilities*

***Select activities or assignments may require the use of a working microphone and/or webcam*

Important dates and personnel

Delivery Mode	Online Content	On Campus Content
Blended On campus with some online components	Asynchronous modules	Lectures Laboratories



Term	Classes Start	Reading Week	Classes End	Exams
Fall	Sep 8 th , 2022	Oct 31 st to Nov 6 th , 2022	Dec 9 th , 2022	Dec 10 th to Dec 22 nd , 2022
Winter	Jan 9 th , 2023	Feb 18 th to Feb 26 th , 2023	Apr 10 th , 2023	April 13 th to April 30 th , 2023

Nov 12th, 2022: Last day to drop a first-term half course without academic penalty.

Nov 30th, 2022: Last day to drop a full course without academic penalty.

Course coordinator:

Dr. Faraj Haddad

Course co-coordinator:

Dr. Hossein Noyan



Course description



In this laboratory course, students will focus on molecular, tissue, and systems-level research practices across various medical science disciplines. Major topics include experimental design; practical laboratory skills; data analysis and interpretation; and scientific literacy and communication. Students will complete tasks both independently and collaboratively and engage in reflective practice.

Pre-requisites: Biology 2244A/B or Statistical Sciences 2244A/B; Biology 2290F/G; Registration in Year 3 of an Honours Specialization or Specialization in Interdisciplinary Medical Sciences (IMS)

Learning outcomes

Upon successful completion of 3990E or 3991F, students will be able to:

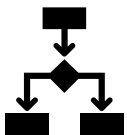
- Skillfully perform foundational laboratory skills such as aseptic technique, pipetting skills, and laboratory math.
- Use foundational laboratory skills to perform a variety of molecular, cellular, and systems biology experiments.
- Apply their understanding of laboratory techniques through appraisal of experimental protocols, experimental data, and scientific questions from primary scientific literature in the basic medical science disciplines (e.g., anatomy, physiology, biochemistry, Immunology, pharmacology, epidemiology, and pathology).
- Perform literature searches using online databases and locate relevant scientific literature. By appraising relevant literature, students will then be able to use it to create scientifically-sound claims and arguments in lab reports.
- Build foundational skills in data analysis (e.g., applied statistics) and data presentation (e.g., graphing, results section construction).
- Communicate their findings and interpretations of this scientific data clearly and accurately to a variety of audiences in written and oral form.
- Exhibit critical reflection skills through reflecting on metacognitive and groupwork strategies.



Weekly content: Lectures, labs, and online modules

Mode	Section	Day	Time
Online asynchronous	All	Mon-Tue	< 1 h (independent)
In person lecture (NCB-113)	All	Wed	11:30am-12:30pm
In person lab Fall: MSB 113-117 Winter: DSB 2005	003	Thu	9:30am-12:30pm
	004	Thu	1:30pm-4:30pm

- **Attendance at lecture and lab in person sessions is required and students must complete all lab course components to pass the course.**
- **If a student is unable to attend an in person session, they must let the instructor know as soon as possible so other arrangements can be made.**
- Asynchronous pre-work must be completed before in person lecture and lab sessions.
- If a lab must be missed due to extenuating circumstances, please contact the course coordinator (Dr. Haddad) as soon as possible before the lab. Depending on the circumstances, either:
 - a single make-up lab will be provided per semester,
 - or an alternative learning activity and/or assessment will be assigned,
 - or the student will be able to participate in the lab remotelyOne of the above options will be provided at the discretion of the course coordinators, depending on the specific circumstances of the students.
- Missed work should be completed within 24 hours.
- Closed captioning or a transcript will be provided on any provided audio or video recordings.



Resources



- All resources will be provided to students through OWL or in person; there is no required textbook for this course but there is a \$20 supplemental cost associated with this course. This covers at-cost supplemental lab materials (e.g. name badge, lab book, printing costs, etc.). Please bring this \$20 in cash (exact change only) to the first lab session.
- A digital guide will be provided.
- Students are expected to bring their own lab coats and safety goggles to each lab session.
- Students will be provided a 3-ply surgical mask at each laboratory session.

Communication within the course, office hours, and contact information

Communication in 3990E

Several platforms will be used to communicate throughout this course and are summarized below. **Students are expected to check both OWL and MS Teams every 24-48 hours.**



Platform	Purpose
OWL <i>Preferably used on Google Chrome.</i>	<ul style="list-style-type: none">• Course updates and announcements• Course resources (e.g., slides, lab data, online modules).
Microsoft Teams <i>Download the desktop app for the best results.</i>	<ul style="list-style-type: none">• Course updates and announcements• Addressing questions related to course content (students are encouraged to attempt to answer their peers' questions).• Directly contacting course coordinators for administrative, personal, or grading purposes.• Video conferencing tool.
Zoom <i>Always log in through UWO.</i>	<ul style="list-style-type: none">• Video conferencing tool.
E-mail <i>E-mails from non-UWO accounts will not be acknowledged.</i>	<ul style="list-style-type: none">• Directly contacting course coordinators for administrative, personal/confidential, or grading purposes.

Unsure who to contact in different situations? Use the table below:



Situation	Who to contact and how to contact them
<p>Questions related to course content</p>	<p>For questions related to topics covered in lectures and labs, please follow these steps:</p> <ol style="list-style-type: none"> 1. Check if your question or a related question has been asked on a previous MS Teams post and answered by Dr. Haddad or Dr. Noyan. If yes, use information from that post and reply to the same post with any follow-up questions. 2. If your question has not been covered previously, create a new MS Teams post on a relevant public channel and tag Dr. Haddad and Dr. Noyan. 3. If you are not comfortable posting your question on public MS Teams channels, message Dr. Haddad and Dr. Noyan through MS Teams direct message, and they will post your anonymous question and address it on the relevant MS Teams channel.
<p>Questions related to</p> <ul style="list-style-type: none"> • Course administration • Personal matters such as accommodation • Grading of all course assessments 	<p>Contact both Dr. Haddad and Dr. Noyan through Email or MS Teams direct message.</p> <p>If contacting through email, include your course code and section number in the subject line of your email. If contacting through MS Teams direct message, include this information in the first message you send.</p> <p>For lab report grading questions, create a group chat on MS Teams direct message including the TA who graded your assignment, Dr. Haddad, and Dr. Noyan.</p>

Office hours

Students may seek additional individual support by requesting Office Hours appointments with either Dr. Haddad or Dr. Noyan using the **Sign-Up Tool on OWL**. For the Fall, all office hours will be virtual. Instructors will ensure any important points related to course content that are covered during office hours are shared with the rest of the class on MS Teams.

Contact information

Course coordinators	
Name	Contact
Faraj Haddad	fhaddad2@uwo.ca
Hossein Noyan	hnoyan@uwo.ca

Contact information

Teaching assistants	
Name	Contact
Heidi Rysan	hrysan@uwo.ca
Mark Kwok	mkwok54@uwo.ca
Jack Teplitzky	jteplit@uwo.ca
Alaa El-Cheikh Mohamad	aelcheik@uwo.ca
Clara Rose Schott	cschott2@uwo.ca
Alanna MacKenzie	amacke56@uwo.ca
Diana Romadina	dromadin@uwo.ca
Rachel Wagner	rwagne2@uwo.ca
Karen Wong	kwong672@uwo.ca
Hassan Hijazi	hhijazi3@uwo.ca

Professionalism, Preparedness, Participation



- Professionalism, participation, and preparedness will be monitored throughout the course by TAs and instructors and these observations will be used to assign the respective grade for each term.
- **Professionalism:** Students are expected to communicate in a professional and respectful manner with their instructors, TAs, and peers. This includes all in-person and online communication. In lab sessions, professionalism also includes adhering to safety protocols (e.g. wearing required PPE) and properly using and maintaining shared equipment (e.g. centrifuges, micropipettes).
- **Preparedness:** Students are expected to have engaged with online asynchronous content prior to in person sessions. Particularly for lab sessions, students who have prepared for the lab by attending the lecture and completing online work tend to make fewer mistakes, complete the lab in a timely manner, and engage more meaningfully with TAs and instructors.
- **Participation:** Students are expected to participate to the best of their abilities throughout the course including in person lectures and online on MS Teams. The more participation the more everyone in the course benefits! On MS Teams, students are always encouraged to post and reply to their peers' posts.

Course content and schedule

Below is a broad look at the weekly schedule for the year. Any deviations will be communicated.

Fall 2022					
Week	Dates		Topic(s)	Assessments	Weighting
	Lecture	Lab			
1		Sep 8 th	Introduction, online safety modules		
2	Sep. 14 th	Sep 15 th	Practical lab skills	Mock quiz	
3	Sep 21 st	Sep 22 nd	Introduction to cell culture	Cell culture quiz 1	1%
4	Sep 28 th	Sep 29 th	Cell culture staining experiment	Cell culture quiz 2	1%
5	Oct 5 th	Oct 6 th	Cell culture data analysis lab	Lab report 1	5%
6	Oct 12 th	Oct 13 th	Genomic DNA isolation	PCR quiz 1	1%
7	Oct 19 th	Oct 20 th	PCR	PCR quiz 2	1%
8	Oct 26 th	Oct 27 th	Running Polyacrylamide gels		
9	Oct 31 st to Nov 6 th		Reading Week		
10	Nov 9 th	Nov 10 th	Introduction to protein assays	Lab report 2	5%
11	Nov 16 th	Nov 17 th	Protein Isolation and BCA assay	Protein quiz 1	1%
12	Nov 23 rd	Nov 24 th	Gels and Coomassie stain	Protein quiz 2	1%
13	Nov 30 th	Dec 1 st	Protein data analysis lab	-Lab report 3 -Molecular diagnostics summary -Molecular diagnostics presentation	5%
14	Dec 7 th	Dec 8 th	Review	-Lab books -Participation and professionalism	5% 5%
Dec 10 th to Dec 22 nd			Exam period	Exam	10%

Winter 2023					
Week	Dates		Topic(s)	Assessments	Weighting
	Lecture	Lab			
1	Jan 11 th	Jan 12 th	Introduction to ELISA		
2	Jan 18 th	*Jan 18 th and Jan 19 th	VEGF ELISA experiment *This experiment requires students to come into the lab on Wednesday 2:30-4:30pm . More details will be provided during the term.	ELISA quiz 1	1%
3	Jan 25 th	Jan 26 th	ELISA data analysis lab	ELISA quiz 2	1%
4	Feb 1 st	Feb 2 nd	Introduction to GST assay and isolation of protein for the assay.	Lab report 4	5%
5	Feb 8 th	Feb 9 th	Gels and Coomassie stain	GST quiz 1	1%
6	Feb 15 th	Feb 16 th	GST data analysis lab	GST quiz 2	1%
7	Feb 18 th to Feb 26 th		Reading Week		
8	Mar 1 st	Mar 2 nd	Introduction to tissue staining	Lab report 5	5%
9	Mar 8 th	Mar 9 th	Tissue staining data analysis	Staining quiz	1%
10	Mar 15 th	Mar 16 th	Introduction to systems physiology experiments		
11	Mar 22 nd	Mar 23 rd	EEG experiment and data analysis	Physiology quiz	1%
12	Mar 29 th	Mar 30 th	Presentations	-Molecular diagnostics summary -Molecular diagnostics presentation	10% 15%
13	Apr 5 th	Apr 6 th	Review	-Lab books -Participation and professionalism	5% 5%
Apr 13 th to Apr 30 th			Exam period	Exam	10%

Evaluation and deadlines

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

- The molecular diagnostics written summary and presentation will be submitted and assessed in groups, all other assessments are individual.
- Quizzes will be open at 4:30 pm on the assigned day and will be due at 11:55 pm that same day.

Fall 2022				
Week	Deadline	Task	Format	Weight
3	Sep 22 nd	Cell culture quiz 1	Online	1%
4	Sep 29 th	Cell culture quiz 2	Online	1%
6	Oct 11 th	Cell culture lab report	Written	5%
6	Oct 13 th	PCR quiz 1	Online	1%
7	Oct 20 th	PCR quiz 2	Online	1%
10	Nov 8 th	PCR lab report	Written	5%
11	Nov 17 th	Protein quiz 1	Online	1%
12	Nov 24 th	Protein quiz 2	Online	1%
13	Nov 29 th	Protein isolation and BCA lab report	Written	5%
14	Dec 8 th	Lab book	-	5%
	Ongoing	Professionalism, Preparedness, Participation	-	5%
	TBD	Term exam	-	10%

Winter 2023				
Week	Deadline	Task	Format	Weight
2	Jan 19 th	ELISA quiz 1	Online	1%
3	Jan 26 th	ELISA quiz 2	Online	1%
4	Jan 31 st	ELISA lab report	Written	5%
5	Feb 9 th	GST quiz 1	Online	1%
6	Feb 16 th	GST quiz 2	Online	1%
8	Mar 1 st	GST lab report	Written	5%
9	Mar 9 th	Staining quiz	Online	1%
11	Mar 23 rd	Physiology quiz	Online	1%
12	Mar 27 th	Molecular diagnostics summary	Group written	15%
12	Mar 30 th	Molecular diagnostics presentation	Group oral	10%
13	Apr 6 th	Lab book	-	5%
	Ongoing	Professionalism, Preparedness, Participation	-	5%
	TBD	Final exam	-	10%

- Written assignments will be submitted to Turnitin (statement in policies below), and students will have unlimited submissions to Turnitin.
- Rubrics will be used to evaluate assessments and will be posted with the instructions.
- A student may 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 with possible questions. Any feedback on assessments is to be requested within 7 days of the assessment being returned to ensure a timely response.

Information about late or missed evaluations:

- Lab reports and molecular diagnostics assessment:
 - When necessary due to extenuating circumstances, deadlines for written components can be combined with a course-specific 2-day grace period to be used at students' discretion (not to be used for every task for which it is available). For the molecular diagnostics assessment, which is a group assignment, the decision whether to use the 2-day grace period must be reached by consensus amongst the entire group.
 - To use the grace period, students must inform the coordinator at least 1 day prior to the initial deadline through email or MS Teams direct message.
 - Late assessments will be subject to a late penalty of 25%/day.
- Quizzes
 - If a student does not miss any quizzes, the best 5 quizzes from each semester will be used toward the final grade.
 - If a student misses 1 quiz per semester, the mark from that quiz will be dropped and the remaining 5 will be used toward the final grade.
 - If a student misses 2 quizzes per semester, the weighting will shift toward the remaining four, such that each will be worth 1.25% (2.5% for 3991F).
 - Students that miss 3 or more quizzes per semester need to contact the course coordinator to arrange an alternative form of assessment.
- Assessments cannot be submitted after they have been returned to the class; in such cases, an alternate assessment may be assigned at the discretion of the coordinator, or the weight may be transferred to the final grade at the discretion of the coordinator.
- All course components (or equivalent, at the discretion of the course coordinators and program) must be completed to pass the course.
- If an assessment is outstanding with documentation at the end of the year, the student will receive an INC and complete the task the next time the course is offered.

Click [here](#) for a comprehensive set of policies and regulations concerning examinations and grading.

The table below outlines the University-wide grade descriptors.

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

Professionalism & Privacy



Western students are expected to follow the [Student Code of Conduct](#). Additionally, the following expectations and professional conduct apply to this course:

Students are expected to follow online etiquette expectations provided on OWL. All course materials created by the instructor(s) are copyrighted and cannot be sold/shared.

Recordings are not permitted (audio or video) without explicit permission.

Permitted recordings are not to be distributed.

All recorded sessions will exclusively remain within the course site or unlisted if streamed

Students will be expected to take an academic integrity pledge before some assessments.

How to be successful in this course

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

1. Invest in a planner or planning application to keep track of your courses. Populate your deadlines at the start of the term and schedule time at the start of each week to get organized and manage time.
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 notes written on a Word document or similar (or, in particular, handwritten notes!) will help you learn more effectively.
5. Connect with others. In addition to your weekly class activities, try forming an online or in person study group for study and peer support.
6. Do not be afraid to ask questions. If you are struggling with a topic, check the online discussion board (i.e. Microsoft Teams General page) to solicit feedback from your peers, GTAs, and instructors. For specific or personal academic questions, don't hesitate to email your instructors directly at their UWO/Schulich email addresses or book an office hours appointment through Sign Up.
7. Celebrate your successes! It can seem easier to motivate ourselves when we take the time to acknowledge the work we've done, the efforts we've made, and the new knowledge and experiences we've gained.

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](#).

Essay Course Guidelines

The guidelines for the minimum written assignments refer to the cumulative amount of written work in a course but excludes written work in examinations. You can read about essay course guidelines [here](#).

An essay course must normally involve total written assignments (essays or other appropriate prose composition, excluding examinations) as follows:

- Full course (1000 to 1999): at least 3000 words
- Half course (1000 to 1999): at least 1500 words
- Full course (2000 and above): at least 5000 words
- Half course (2000 and above): at least 2500 words

The structure of the essay course must be such that in order to pass the course, the student must exhibit some minimal level of competence in essay writing and the appropriate level of knowledge of the content of the course.

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](#).

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.

Support Services at Western University

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](#)