Materials for Medical Applications (CHEM 9923), Winter 2026

Land Acknowledgement

Western University Campus is located on the traditional, ancestral, and unceded territory of the Anishinaabek, Haudenosaunee, Lūnaapéewak, and Chonnocton (Neutral) peoples. The university also recognizes the Huron-Wendat peoples' history in the area. The land it is situated on, has always been a place of learning for these peoples, who for millennia have passed on their culture, history, and traditions from one generation to the next on this site.

Instructor: Dr. Megan Roberts (she/her/hers)
Office: 2020; email: megan.roberts@uwo.ca

Lectures: WF 10:30 AM to 12:00 PM in Materials Science Addition (MSA) 3204.

Brief lecture notes will be available at the CHEM 9923 OWL Brightspace site ahead of each class. *These notes do not represent all the concepts that will be discussed in lecture*. Therefore, it is important to attend all CHEM 9923 classes. It is here that fundamental course content will be presented and explained.

Course Description:

CHEM 9923 Materials for Medical Applications (0.25 credits) is a graduate level course that examines the science and engineering of materials designed for use in medical and healthcare contexts. With a strong foundation in biomaterials, the course explores how material properties, biological interactions, and design considerations shape the development of advanced medical technologies. Topics may include implantable devices, tissue scaffolds, drug delivery systems, diagnostic materials, and antimicrobial strategies. Emphasis is placed on translational challenges, current research, and case studies that reflect emerging innovations. Course themes may shift year-to-year to highlight evolving priorities in the field of medical materials science.

Student Learning Outcomes:

1. Analyze the fundamental relationships between material properties and performance in biological environments.
2. Evaluate design, selection, and application of biomaterials for therapeutic, diagnostic, and drug delivery purposes.
3. Interpret and critique literature on emerging medical materials, including molecular therapeutic, nanomaterial, polymer-based, and hybrid systems.
4. Apply principles of materials science to propose or improve a medical device, therapy, or diagnostic system.
5. Reflect on ethical, regulatory, and societal considerations in the development of materials for medical use

Evaluation/Grading Scheme:		
	Synthetic Strategies Problem Set	15 %
	NSERC PDF Proposal Assignment	50 %
	Final Oral Exam*	35 %

* *Will take place during the examination period.*

NSERC PDF Proposal:

Developing research ideas is one of the key skills you gain as a graduate student. You will use these skills to propose your own research project. You will select a research group that **does research focused on biomaterials** and then develop a proposal for a project you would work on during a *two-year* postdoctoral fellowship within that research group.

You will be expected to meet different milestones over the period of six weeks leading up to this assignment's final **deadline on April 6th, 2026** at 11:59 PM (to be submitted on OWL Brightspace).

Late Policy: Assignments submitted within 24 hours of deadline will have 10% deducted. Assignments submitted within 48 hours of deadline will have 25% deducted. **No marks will be given for assignments handed in after the 48 hours.**

Course Policies:

- Communication with the instructor: students should email from their UWO email account. Include the course code in your subject and allow 24 hours for a response on **weekdays**; generally, I will not respond on weekends.
- Announcements: Official announcements will be posted on the CHEM 9923 course page on OWL Brightspace. **It is YOUR RESPONSIBILITY to check these postings regularly for important announcements.**
- Privacy and appropriate use of course materials: Lectures will be recorded, and should the student require access, they will be made available. The quality of these recordings cannot be guaranteed. These recordings should be considered private and for the use of students registered in the course **only**. They may not be shared or reposted in any way. Students

may not make their own recordings, either for personal use or distribution. Students with accessibility requirements should contact Dr. Roberts to make appropriate arrangements.
- If you are sick, please stay home rather than risk making others sick. If you miss class or a deadline due to illness or require an accommodation, **please e-mail Dr. Roberts and she will do her best to co-ordinate.**
- Treat others respectfully: You are expected to treat all your classmates, instructors, and yourself with respect at all times, both in and out of the classroom, face-to-face and in writing (e.g., on email). This includes arriving to class on time and minimizing distractions for other students.

Institutional Policies and Support:

Academic Integrity: The academic enterprise is founded on **honesty**, **civility**, and **integrity**. As members of this enterprise, all of us are expected to know, understand, and follow the codes of conduct regarding academic integrity. At the most basic level, this means **submitting only original work and acknowledging all sources of information or ideas, and attributing them to others** as required. This also means we should not cheat, copy, or mislead others about what is our work. Violations of academic integrity (i.e., misconduct) lead to the breakdown of the academic enterprise, and therefore severe consequences arise, and harsh sanctions are imposed. **Incidences of plagiarism or cheating [will] result in a mark of zero on the assignment or exam and more serious consequences may apply. They will also be reported to the Dean's office.** Careful records will be kept in order to monitor and prevent recurrences. Students are directed to read the appropriate policy, and specifically, the definition of what constitutes a Scholastic Offence from UWO here.

What You Can Expect from your Instructor:

- Posting materials and grades online: PowerPoint slides in .pdf format, handouts, and other teaching materials will be available *before* class on OWL Brightspace. Information written during class will not be posted online. Grades will be posted on OWL Brightspace.
- Arrange for and provide feedback: I will attempt to provide you with feedback on assignments as promptly and as with as much detail as possible.
- Act respectfully and ethically: Always, I aim to treat each of you with respect, and to make all course decisions with the highest standard of ethics in mind. If you feel you are being treated unfairly or disrespected by me or a classmate, I invite you to talk to me so we can sort out the issue together. To be clear: such a discussion would not impact grades.
- Consider re-grade requests: If you feel very strongly that any test or assignment question was graded unfairly, please email Dr. Roberts with a subject line: "CHEM 9923 Re-Grade Request" and include a clear explanation of your concern and your assignment/exam. You must do so within 1 week of the date grades were made available on OWL Brightspace. I will only regrade in-person quizzes that were written using pen. Re-grading may result in an increase or decrease. That re-grade is final.

Technology-Enhanced Learning:

Throughout this course, we will be using various technologies to help us communicate, assess your learning, and keep organized. We will be using the following platforms:

OWL Brightspace https://westernu.brightspace.com/ Keep organized here. Log in regularly and frequently for lecture slides, assignments, announcements, your grades, calendar, discussion threads, and links and instructions for all other resources. Rather than emailing questions to instructors directly, we encourage you to post your questions here.

Open AI (Chat GPT) or Grammarly In this class, I consider AI to be a tool that can assist in your writing and thinking. For every assignment where AI such as ChatGPT or Grammarly was used, I expect the student to provide information on the program employed, the prompts used, how information gained was used to complete the assignment as well as your assessment of its overall value. A student's AI statement must appear at the end of the assignment. Use of AI is not required, but the statement is. If you did not use AI, just say so. Here are resources that discuss use of AI in writing: Times Higher Education and Texas State.

Other Resources to Consider:

Your success is important to me. Reach out and ask for help if you need it. University students encounter setbacks from time to time. It is completely normal. It is understandable that these can impact academic performance. If you run into difficulties and need assistance, I encourage you to contact me by email, during office hours, before or after class, or by dropping by my office (see above).

TAKE CARE OF YOURSELF. For information about addressing mental or physical health concerns, including **counseling services** and more, visit http://www.health.uwo.ca/.