

Math 9310 Course Outline

1. Course Information

Course Information

Math 9310 *Introduction to Complex Manifolds*, Fall 2026, This course is synchronous online via Zoom.

This is a Fields Institute Graduate course. For further details consult the course page at Fields:

<https://www.fields.utoronto.ca/activities/26-27/SGC-manifolds>

List of Prerequisites

The required background is a course in one complex variable, linear algebra, and a basic course in geometry that covers smooth manifolds. Knowledge of differential forms will be helpful.

Unless students have either the prerequisites for this course or written special permission from the Department of Mathematics to enroll in it, they may be removed and withdrawn from this course in accordance with university policy. This may be done after the add/drop deadline of the academic term, and the course will be marked as withdrawn (WDN) on their academic record. This decision may not be appealed.

Enrollment Restrictions

Enrollment in this course is restricted to graduate students in the Mathematics Graduate Program as well as any student that has obtained special permission to enroll in this course from the course instructor as well as the Graduate Chair (or equivalent) from the student's home program. For the policy on undergraduate students taking graduate courses, please see the policy on "Undergraduate Course Credit".

2. Instructor Information

Instructors	Email	Office	Phone	Office Hours
Prof. Rasul Shafikov	shafikov@uwo.ca			

Regular office hours are to be held via Zoom, or in person by appointment.

3. Course Syllabus, Schedule, Delivery Mode

Complex manifolds form a rich class of manifolds that connects complex analysis, differential geometry, algebraic topology, algebraic geometry, PDEs, and other branches of mathematics together. Complex manifolds have many deep applications not only in mathematics but also in physics. It is currently one of the most actively developed areas of pure mathematics that offers many open unsolved problems.

The goal of the course is to give a gentle introduction to complex manifolds, emphasizing the underlying concepts, basic geometric constructions, and outlining several fundamental results. The intent is to cover both Stein and projective manifolds, including the Kodaira embedding theorem. The course evaluation will be based on homework assignments.

Course begins: **September 8, 2026**;
Fall Reading Week: October 10 – 18, 2026;
Course ends **December 3, 2026**;

4. Course Materials

Textbooks and Other Learning Materials

1. **Recommended textbook:** John M. Lee, *Introduction to Complex Manifolds*, American Math Society, 2024, available on the AMS bookstore:
<https://bookstore.ams.org/view?ProductCode=GSM/244>
The book is currently on sale for \$55.25 USD (eBook edition). Any format or edition of this book is acceptable.
2. Optional text: Daniel Huybrechts, *Complex geometry, an introduction*. Springer-Verlag, Berlin, 2005.
3. Optional text: R. O. Wells, Jr., *Differential Analysis on Complex Manifolds*. Springer-Verlag, GTM 65.

Additional course material will be posted on the Fields Course page.

Technical Requirements

Students are required to have stable internet connection, computer with working microphone and/or webcam, and have Zoom installed.

5. Methods of Evaluation

Grading Scheme and Assessment Dates

The overall course grade will be calculated as listed below:

Assignments (best 3 out of 4) 100% Approximate due dates: Oct 9, 30; Nov 13, 27.

Use of Generative AI Tools

Independent Work: Generative AI tools must not be used to generate solutions for homework assignments. Submitted problem sets must entirely reflect your own analytical work and reasoning.

Learning Aid: Students are encouraged to use AI responsibly as a virtual tutor. Acceptable uses include asking for alternative explanations of mathematical statements discussed in class, summarizing definitions, or breaking down challenging course material into manageable steps.

Note: AI may be used by the instructor to assist with grading.

Information about Missed Coursework

This course does not contain components that may require Academic Consideration.

All take-home assignments include an automatic 48-hour period after the deadline during which students may still submit without a late penalty. For example, if an assignment is due on November 5, they may submit it until November 7 without penalty. After this 48-hour period, no further submissions will be accepted, and students do not need to request Academic Consideration for a missed deadline; their grade for this component will be calculated as described above.

If a student completes fewer than 3 of the total assignments, the missing items will be recorded as a zero and included in their grade for this component. Students are encouraged to submit all work, even if incomplete, since a partial mark is always better than a zero.

6. Additional Statements

6.1 Religious Accommodation

When a recognized religious holiday either requires a student to be absent from the University, or requires or prohibits an activity that makes it impossible for them to complete an academic requirement scheduled that day, they are entitled to accommodation. No student will be penalized for an absence for religious reasons, and an alternative means of satisfying the requirement will be arranged. This accommodation is provided in accordance with the University's policy on Accommodation for Religious Holidays:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf

Students are responsible for finding out what was covered in any class they miss due to a religious observance, and for taking the appropriate steps to keep up with the course.

If a suitable arrangement cannot be reached between a student and their instructor, they should consult the Undergraduate Chair of the department offering the course, and if necessary, the Associate Dean (Academic) of the Faculty of Science.

For a list of recognized religious observances, please visit the calendars posted on the Equity, Diversity & Inclusion website - <https://www.edi.uwo.ca> (About Us – Resources – Additional Resources – Calendars).

6.2 Academic 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.

6.3 General Academic Policies

The website for Registrar Services is <https://www.registrar.uwo.ca/>.

Use of @uwo.ca email: In accordance with policy, 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 email address. It is the responsibility of the account holder to ensure that emails received from the University at their official university address are attended to in a timely manner.

Requests for Relief (formally known as “appeals”)

Policy on Request for Relief from Academic Decision:

https://uwo.ca/univsec/pdf/academic_policies/appeals/requests_for_relief_from_academic_decisions.pdf

Procedures on Request for Relief from Academic Decision (Undergraduate):

https://uwo.ca/univsec/pdf/academic_policies/appeals/undergrad_requests_for_relief_procedure.pdf

Procedures on Request for Relief from Academic Decision (Graduate):

https://uwo.ca/univsec/pdf/academic_policies/appeals/graduate_requests_for_relief_procedure.pdf

6.4 Scholastic Offences

Policy on Scholastic Offences:

https://uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_offences.pdf

Procedures on Scholastic Offences (Undergraduate):

https://uwo.ca/univsec/pdf/academic_policies/appeals/undergrad_scholastic_offence_procedure.pdf

Procedures on Scholastic Offences (Graduate):

https://uwo.ca/univsec/pdf/academic_policies/appeals/graduate_scholastic_offence_procedure.pdf

Use of Electronic Devices During Assessments

In courses offered by the Faculty of Science, the **possession** of unauthorized electronic devices during any in-person assessment (such as tests, midterms, and final examinations) is strictly prohibited. This includes, but is not limited to: mobile phones, smart watches, smart glasses, hidden cameras and wireless earbuds.

Unless explicitly stated otherwise in advance by the instructor, the presence of any such device at a student's desk, on their person, or within reach during an assessment will be treated as a scholastic offence, **even if the device is not in use**.

Effective September 2026, the typical penalty for this offence is a failing grade in the course AND a 12-month prohibition on retaking the course.

Only devices expressly permitted by the instructor (e.g., non-programmable calculators) may be brought into the assessment room. It is their responsibility to review and comply with these expectations.

Use of Generative AI Tools

Unless otherwise stated, the use of generative AI tools (e.g., ChatGPT, Microsoft Copilot, Google Gemini, or similar platforms) is **not permitted** in the completion of any course assessments, including but not limited to: assignments, lab reports, presentations, tests, and final examinations.

Using such tools for content generation, code writing, problem solving, translation, or summarization—when not explicitly allowed—will be treated as a **scholastic offence**.

If the use of generative AI is permitted for a particular assessment, the conditions of use will be specified by the instructor in advance. If no such permission is granted, students must assume that use is

prohibited. It is the student's responsibility to seek clarification before using any AI tools in academic work.

6.5 Support Services

Academic Advising. Please visit the Science & Basic Medical Sciences Academic Advising webpage for information on adding/dropping courses, academic considerations for absences, requests for relief, exam conflicts, and many other academic-related matters: <https://www.uwo.ca/sci/advising/>.

Mental Health Support. 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.

Gender-Based and Sexual Violence. Western is committed to reducing incidents of gender-based and sexual violence (GBSV) and providing compassionate support to anyone who has gone through these traumatic events. If a student has experienced GBSV (either recently or in the past), they can 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.

Accessibility for Coursework. A student may contact the course instructor if they require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to them. If they have any questions regarding accommodations, they may also contact Accessible Education at http://academicsupport.uwo.ca/accessible_education/index.html

Accessible Education (AE):

Western is committed to achieving barrier-free accessibility for all its members, including graduate students. As part of this commitment, Western provides a variety of services devoted to promoting, advocating, and accommodating persons with disabilities in their respective graduate program.

Graduate students with disabilities (for example, chronic illnesses, mental health conditions, mobility impairments) are strongly encouraged to register with Accessible Education (AE), a confidential service designed to support graduate and undergraduate students through their academic program. With the appropriate documentation, the student will work with both AE and their graduate programs (normally their Graduate Chair and/or Course instructor) to ensure that appropriate academic accommodations to program requirements are arranged. These accommodations may include individual counselling, alternative formatted literature, accessible campus transportation, learning strategy instruction, writing exams and assistive technology instruction.

Learning Development and Success. Learning-skills counsellors at Learning Development and Success (<https://learning.uwo.ca>) are ready to help students improve their learning skills. The facility offers 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.

Student Councils.

Student-run support services are offered by the University Students' Council (<https://westernusc.ca>) and the Science Students' Council (<https://www.westernssc.ca>).