

The University of Western Ontario (Western University)

Math 9024A/3124A, Fall 2021
Complex Analysis I

September–December 2021

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The course will meet MWF 2:30-3:20 pm, in HSB room 9

This is a standard course (a first course) in complex analysis. The official description from the university calendar is:

The Cauchy-Riemann equations, elementary functions, branches of the logarithm and argument, Cauchy's integral theorem and formula, winding number, Liouville's theorem and the fundamental theorem of algebra, the identity theorem, the maximum modulus theorem, Taylor and Laurent expansions, isolated singularities, the residue theorem and applications, the argument principle and applications.

The course is about properties of functions of one complex variable. There are striking differences between functions of one complex variable z and functions of one real variable x . For example, if a function f is a complex-differentiable function of z on a disk, then f is infinitely differentiable on this disk. There is no "real version" of this statement (if $f'(x)$ exists on an interval (a, b) , we can not conclude that $f''(x)$ exists on (a, b)). The fundamental concepts in real and in complex analysis are the same: limits, derivatives, integrals, sequences, convergence, series. However, in complex analysis a lot of interesting phenomena occur. The resulting techniques are used in many branches of mathematics and in applied sciences.

The course textbook is "Complex analysis" by J. Bak and D. Newman. This book is available online at the university library.

The prerequisite is a course in real analysis (UWO Math 2122A/B or equivalent).

For Math 3124A students: Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

WHAT IS EXPECTED OF THE STUDENT: Course participants are expected to attend all class meetings, review all learning materials in timely fashion, follow class announcements, complete all assignments and write all examinations. Solutions of collected homework problems must be written neatly, and handed in by the deadline.

Students are responsible for checking the course owl site (<http://owl.uwo.ca>) on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class.

All course material will be posted to OWL: <http://owl.uwo.ca>.

If students need assistance with the course OWL site, 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.

CONTINGENCY PLAN FOR AN IN-PERSON CLASS PIVOTING TO 100% ONLINE LEARNING: In an event during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining course content will be delivered entirely online. Any synchronous content will be delivered on zoom during the times indicated in the timetable. Any asynchronous content will be posted on the owl site. The grading scheme will not change. Any remaining assessments will also be conducted online as determined by the course instructor. For the online mode of course delivery the following technical requirements will be applicable: computer with a microphone and webcam, stable internet connection, a scanner or an alternative. Any remote learning sessions will not be recorded. Any online proctored assessments will not be recorded.

EVALUATION OF STUDENT PERFORMANCE:

assignments 40%

midterm exam 35% (**Thurs. Oct. 21, 7-9 pm, room TBA**)

final exam (**2 hours, to be scheduled by the Registrar's office**) 25%

Graduate students (those enrolled in 9024A) will be given a somewhat harder version of the exams than the undergraduate students (those registered in 3124A).

ACCOMMODATED EVALUATIONS: late homework will not be accepted. Please submit any time before the deadline. If there is proper documentation for a missed assignment, then the homework component of the grade will be adjusted accordingly. In order to obtain a passing numerical course grade, a student must write a proctored assessment. If an undergraduate student missed the midterm test and accommodation is approved by academic counseling, then a make up test will be given. If a graduate student missed the midterm test for a valid reason (as decided by the course instructor and, if appropriate, by the graduate chair), then a make up test will be given.

STUDENT ABSENCES: Academic Consideration for Student Absences as applies to Math 3124A. Students who experience an extenuating circumstance (illness, injury or other extenuating circumstance) sufficiently significant to temporarily render them unable to meet academic requirements may submit a request for academic consideration through the following routes:

(i) Submitting a Self-Reported Absence (SRA) form provided that the conditions for submission are met. To be eligible for a Self-Reported Absence:

- an absence must be no more than 48 hours
- the assessments must be worth no more than 30% of the student's final grade
- no more than two SRAs may be submitted during the Fall/Winter term

(ii) For medical absences, submitting a Student Medical Certificate (SMC) signed by a licensed medical or mental health practitioner to the Academic Counselling office of their Faculty of Registration.

(iii) Submitting appropriate documentation for non-medical absences to the Academic Counselling office in their Faculty of Registration. Note that in all cases, students are required to contact their instructors within 24 hours of the end of the period covered, unless otherwise instructed in the course outline.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. **All documentation required for absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office of a student's Home Faculty.**

Observe that Self-Reported Absences may not be used to request accommodation for a missed midterm exam (or a missed final exam) in Math 3124A.

For the policy on Academic Consideration for Student Absences – Undergraduate Students in First Entry Programs, see:

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

and for the Student Medical Certificate (SMC), see:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf

RELIGIOUS ACCOMMODATION: When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, undergraduate students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Graduate students should give a reasonable notice to the instructor, in writing, if their course requirements will be affected by a religious observance. Please consult University's list of recognized religious holidays (updated annually) at

<https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>.

ABSENCES FROM Math 3124A FINAL EXAMINATION: If you miss the Final Exam, please contact the Academic Counselling office of your Faculty of Registration as soon as you are able to do so. They will assess your eligibility to write the Special Examination (the name given by the University to a makeup Final Exam).

You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (e.g., more than 2 exams in 23-hour period, more than 3 exams in a 47-hour period).

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See the Academic Calendar for details (under Special Examinations).

ABSENCES FROM Math 9024A FINAL EXAMINATION: If you miss the Final Exam, please contact the instructor as soon as you are able to do so and provide a reason. Instructor (and, if appropriate, the graduate chair) will assess your eligibility to write a make-up exam.

ACCOMMODATION AND ACCESSIBILITY:

Accommodation Policies Students with disabilities work with Accessible Education (formerly SSD), 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

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 encouraged to register with Accessible Education, 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 include individual counselling, alternative formatted literature, accessible campus transportation, learning strategy instruction, writing exams and assistive technology instruction.

See <http://www.sdc.uwo.ca/ssd/>

ACADEMIC POLICIES: The website for Registrarial Services is <http://www.registrar.uwo.ca>.

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 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.

No aids will be permitted on tests and exams. Electronic devices, including calculators, will not be permitted on in-person tests and exams. In case of pivoting to tests and exams administered on zoom, instructions for the use of electronic devices during the examination will be provided by the course instructor.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf

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

SUPPORT SERVICES: Please visit the Science and Basic Medical Sciences Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/counselling/>.

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Accessible Education at (519) 661-2147 if you have any questions regarding accommodations.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: <https://www.uwo.ca/se/digital/>.

Learning-skills counsellors at the Student Development Centre (<http://www.sdc.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on 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.

Students who are in emotional/mental distress should refer to Mental Health@Western (<http://www.health.uwo.ca/mentalhealth>) for a complete list of options about how to obtain help.

Additional student-run support services are offered by the USC, <http://westernusc.ca/services>