MATH 3007A - Functions of a Complex Variable
Fall 2020

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Office Hours Online, by appointment

Textbook Lecture notes on CULearn

Lectures Posted online, beginning Wednesday, September 9

Tutorials Online, Wednesdays 2:35 - 3:25, beginning September 23

Tests There will be five tests, held during the tutorial periods, on the following dates:

Test 1: Wednesday, September 30
Test 2: Wednesday, October 14
Test 3: Wednesday, November 4
Test 4: Wednesday, November 18
Test 5: Wednesday, December 2

Marking Scheme

The best four out of the five tests will count for 60% and the final examination for 40% of the final grade.
There will be no make-up tests.
Students who wish to review their final examination paper must do so within three weeks of the examination period.

Topics

Complex numbers
Polar representation of complex numbers
Euler's identity
De Moivre's formula
Roots of complex numbers
The complex exponential function
The complex trigonometric functions
The argument of a complex number
The complex logarithm
Complex exponents of complex numbers

Limits and continuity
The extended complex plane
Limits at infinity and infinite limits
Open sets and neighbourhoods
The complex derivative and analytic functions
The Cauchy-Riemann equations
The derivative of the logarithm
Connected sets
Alternative form of the Cauchy-Riemann equations
Harmonic functions
Curves in the complex plane
Line integrals
Arclength
The fundamental theorem for line integrals
Path independence of integrals
The path independence theorem
Homotopy
Simply-connected sets
The deformation theorem
Cauchy's theorem – homotopy version
Cauchy's theorem – for a simply-connected domain
The antiderivative theorem
The generalized deformation theorem
Winding number
Cauchy's integral formula
Cauchy's integral formula for derivatives
Series representations of analytic functions
Taylor series
Laurent series
Singularities
Poles
Zeros
Residues
The residue theorem
Evaluation of definite integrals
Evaluation of infinite series
Conformal mappings

Academic Accommodation

Pregnancy obligation

Contact me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: https://carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf.

Religious obligation
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Academic accommodations for students with disabilities
If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with your instructor as soon as possible to ensure accommodation arrangements are made. PMC website: https://carleton.ca/pmc.

Last modified: August 25, 2020, 2:00 PM.