

Math 483/583: Complex Variables

Spring 2019

(Section 1, CRN 55361/55362)

Course Credits: 3

Lectures: 9:00 - 9:50 AM on Monday, Wednesday, Friday at Covell Hall 218.

Instructor: Tuan Pham

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Course website:

<http://people.oregonstate.edu/~phamt3/Courses/S19-Math-483-583/S19-Math-483-583.html>, materials will be posted on Canvas as well.

Office: Kidder 268, **phone:** 541-713-6196

Office Hours: Monday, Wednesday, Friday 10:00 - 11:30 AM at Kidder 268.

Textbook: “*A First Course in Complex Analysis*” by M. Beck, G. Marchesi, D. Picton, L. Sabalka. It is free and downloadable at: <http://math.sfsu.edu/beck/papers/complex.pdf>. However, our lectures will not strictly follow the textbook. Please see the tentative calendar. Other helpful materials (but not required) are:

- *Complex Variables for Mathematics and Engineering* by John H. Mathews, available at Valley Library.
- *Visual Complex Analysis* by Tristan Needham.

Course Description: this is an introduction to differential and integral calculus of functions of complex variable. Students should already be familiar with calculus of functions of real variable (Math 251, 252). The course focuses more on computation and visualization than rigorous proofs. Basic topics introduced include: Cauchy’s theorem and formula, the residue calculus, Taylor series and Laurent series, harmonic functions, conformal mapping, and some applications.

Math 483/583 Learning Outcomes: A successful student in MTH 483/583 will be able to:

1. Perform elementary operations on complex numbers: algebraic operations, taking exponentiation, logarithm, etc.
2. Identify geometric mapping properties of some simple complex functions: linear fractional transformation, power functions, exponential functions, etc.
3. Determine differentiability based on Cauchy-Riemann equations.
4. Compute line integrals directly, or through Cauchy’s theorem, or residue theorem.
5. Compute certain types of integrals over real variable using residue calculus.

Topics covered: See the tentative calendar.

Grading:

Homework: 40%

Midterm: 30%

Final Exam: 30%

Homework: due at 11:59 PM on Canvas every Wednesday, except for the first week and the week of the midterm exam.

Policy: Homework must be typed and submitted on Canvas as pdf file. Students are encouraged to work together in groups. However, homework must be written individually in your own words and reflect your own understanding. To stimulate the learning of LaTeX, a mathematical typesetting program, students will receive a 10% increased score on any homework generated with LaTeX. Late homework will not be accepted. Turn in whatever you have completed by the due date. Only a few selected problems will be graded in detail. The rest will be given credit based on completion.

Requirements for written work: this course requires the written communication of mathematical ideas. To obtain full credit for your work, you must write coherently, in complete sentences, with attention to your audience.

Mathematical software: Although lab is not a component of this course, you will need a mathematical software called Mathematica to do some homework problems. You can download Mathematica with OSU's license to your personal computer from here: <https://is.oregonstate.edu/service/software/mathematica>. If you are unable to install it on your computer, you can use computers at the lab room Kidder Hall 108J almost anytime from 9 AM to 4 PM, Monday through Friday.

Midterm Exam: in class, on Monday May 6.

Policy: Calculators and note cards are not allowed. Each student is allowed to bring one white sheet of paper for draft. Proctor can provide extra draft papers if requested during exam. Some formula will be given on the front page of the exam. Any regrading request must be addressed within one week after the work being returned. There will be no make-up exam except for exceptional reasons.

Final exam: 9:30 - 11:20 AM, Thursday June 13, Covell Hall 218 (regular classroom).

Policy: Final exam mostly focuses on the second half of the term. Calculators and note cards are not allowed. Each student is allowed to bring one white sheet of paper for draft. Proctor can provide extra draft papers if requested during exam. Some formula will be given on the front page of the exam. Any requests for special accommodation (make-up exam, etc) must be addressed to instructor prior to the day of the Final exam. Skipping Final exam will automatically result in a grade of F.

Grade lines: the course grades will not be harder than: A 100-90%, B 89-80%, C 79-70%, D 69-60%, and F 59% and under. Scores on Canvas are raw scores. The running total that Canvas provides may not be accurate since it does not take into account the percentage of

homework/exams as indicated above. Instructor will calculate total course scores at the end of the term.

Other Learning Resources: The Math Learning Center MLC in Kidder 108 is a great place to drop in for help. It's open from 9am to 4 pm M-F from the second week of classes through the end of dead week.

Academic Honesty

Students are expected to obey OSU's Student Conduct Code http://studentlife.oregonstate.edu/sites/studentlife.oregonstate.edu/files/code_of_student_conduct.pdf

Statement Regarding Students with Disabilities

Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at <http://ds.oregonstate.edu>. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.