

Math 419-01, Complex Variables, Fall 2017
MWF 12:15-1:20 pm, OSS 214

Instructor: Amy DeCelles

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Tentative office hours: MWF 9:30-10:30, Tu 2-3, Th 4-5, and by appointment

Course Prerequisites: A grade of C- or above in MATH 201 and MATH 240

Credits and Workload Expectations: 4 credits: 8-10 hours per week outside the classroom.

Textbook: *Complex Variables: Harmonic and Analytic Functions*, by Francis J. Flanigan.

Overview: In this course we study functions whose inputs and outputs are complex numbers. We are most interested in functions that are complex differentiable on an open connected region in the plane. Such functions are called *holomorphic*. Perhaps surprisingly, holomorphic functions are much more tightly constrained than the differentiable functions we study in calculus. Besides studying the properties of holomorphic functions, we also study Cauchy integral theory (which allows us to evaluate integrals without antiderivatives) and Laurent series (extended Taylor series, which are allowed to have negative powers).

Course Objectives:

- Gaining a basic understanding of the subject (e.g. factual knowledge, methods, principles, generalizations, and theories): *knowledge of definitions, notation, statements of theorems*
- Learning to apply course material (to improve thinking, problem solving, and decisions): *using definitions and theorems to solve problems, answer questions, or prove claims*
- Developing specific skills, competencies, and points of view needed by professionals in the field most closely related to this course: *techniques including complex differentiation and integration, calculating residues*
- Developing skill in expressing oneself orally or in writing: *explaining your reasoning informally and formally through discussion, presentation, and written work*
- Learning to analyze and critically evaluate ideas, arguments, and points of view: *analyzing proofs that you read and that you write, evaluate true/false statements*

Assignments: To prepare for class you will be assigned reading, along with **reading questions** and **discussion problems** related to the reading. After we have covered a topic in class, you will be assigned a **written problem set**, consisting of some of the discussion problems and some additional problems related to the topic. Occasionally, in-class participation or presentations may be graded.

Collaboration and consultation: I encourage you, when working on homework, to collaborate with fellow students, to reread the textbook, and to ask me for help. You are also free to consult

other textbooks or online resources for general information on the topic. However, you may not consult any worked solution to an assigned homework problem. This includes but is not limited to online solutions and other students' written homework. Moreover, when you are writing up your homework, you must write your own solutions, in your own words. If in doubt about the acceptability of a certain kind of collaboration or consultation, ask me.

Late Work: Late work is typically not accepted. The lowest three reading question and discussion preparation scores will be dropped at the end of the semester. Extensions may be granted if requested before the due date, and work may certainly be submitted before the due date, if arrangements have been made with the professor in advance. If there is a serious, unforeseeable reason for missing more than three days of class, it is the student's responsibility to contact the professor as soon as possible and to make appointments with the professor and with Academic Counseling upon returning to classes to make a plan for making up missed work.

Missed Exams: Make-up midterm exams may be given to students with legitimate excuses such as serious illness, university sponsored events, etc., as long as the make-up exam can be taken within a reasonable time frame. If it is not possible to schedule a make-up exam within a reasonable time frame, the grade for the midterm may be prorated from the final exam. Written documentation may be required. Rescheduling the final is not possible except under very extreme circumstances.

Incompletes: Grades of I are normally not given in this course. However, they may be granted due to extenuating circumstances especially if (i) the majority of the course work has been completed at a level of C or better and (ii) the student demonstrates the ability to complete the remaining coursework outside of the classroom. In such cases, a well-documented petition should be submitted to the professor before the last day of classes. Please see the university policies on [withdrawals](#) and [incomplete grades](#).

Final Course Grade: The overall score for this course will be computed as outlined below. Final letter grades will be assigned based on the overall score, with the two mastery components, written work and exams also being considered separately. In particular, the final letter grade will not be higher than one letter grade above the level of the work on written work or the work on exams. Exceptional performance on the final may also be taken into account.

- Preparation and participation (20%): reading questions (10%), discussion problems (10%)
- Mastery assignments (30%):, written problems sets, oral presentations, projects
- Midterm exams (30%): tentatively scheduled for Sep 29, Oct 23, Nov 17
- Final exam (15%): cumulative; 8:00 am - 10:00 am Fri Dec 22
- Best exam (5%): at the end of the semester, your best exam score will count an extra 5%

Disability Accommodations: Academic accommodations will be provided for qualified students with documented disabilities including but not limited to mental health diagnoses, learning disabilities, Attention Deficit Disorder, Autism, chronic medical conditions, visual, mobility, and hearing disabilities. Students are invited to contact the Disability Resources office about accommodations early in the semester. Appointments can be made by calling 651-962-6315 or in person in Murray Herrick, room 110. For further information, you can locate the Disability Resources office on the web at <http://www.stthomas.edu/enhancementprog/>.