

Math 555 - Functions of a Complex Variable with Applications, Winter 2016

INSTRUCTOR: Dr. Yulia Hristova

OFFICE: 2079 CASL Building; tel. (313) 593-5175

EMAIL: yuliagh@umich.edu (see e-mail do's and don'ts below)



WEB: canvas.umich.edu

OFFICE HOURS: (subject to change) M: 2-3 pm; TR: 11:30 am - 12:30 pm

COURSE MEETING TIMES: TR 3:30 pm - 4:45 pm, CASL 2070

COURSE DESCRIPTION: Complex number system. Functions of a complex variable, their derivatives and integrals. Taylor and Laurent series expansions. Residue theory and applications, elementary functions, conformal mapping, and applications to physical problems. Students cannot receive credit for both MATH 455 and MATH 555.

COURSE OBJECTIVES: This course will introduce students to the basic concepts of the theory of calculus over the field of complex numbers. Students who successfully complete the course should be able to work with the complex number system, understand and be able to apply major results regarding complex valued functions of a complex variable, and use some of these in applications.

REQUIRED MATERIALS: Brown and Churchill, Complex Variables and Applications (8th Edition), McGraw-Hill, 2009. Students may choose to use an older (or newer) edition. The problems or problem numbers in different editions may differ from those in the 8th edition. Students will be responsible for verifying the correct homework assignments.

SUPPLEMENT: Zill and Shanahan, A First Course in Complex Analysis with Applications, any edition. This textbook is more elementary than the official text and contains a large number of problems. Hence, some students might find it useful as an additional reference. Inexpensive editions (about \$20) are available online (e.g. abebooks.com).

GRADING POLICY: Grades will be based on homework assignments and quizzes, two midterm exams, and a comprehensive final exam. Requests for regrading assignments and mid-term exams must be made within one week after the items in question have been returned to the class. *Your grade is based solely on performance.*

Attendance	Homework & Quizzes	Graduate Project	2 Midterm Exams	Final Exam
1%	10%	10%	50 % (25% each)	29%

GRADING SCALE:

$100 \geq A \geq 94$	$84 > B- \geq 80$	$70 > D+ \geq 67$
$94 > A- \geq 90$	$80 > C+ \geq 77$	$67 > D \geq 64$
$90 > B+ \geq 87$	$77 > C \geq 74$	$64 > D- \geq 60$
$87 > B \geq 84$	$74 > C- \geq 70$	$60 > E$

HOMEWORK: Homework assignments will be posted on Canvas after each covered section. Only part of the problems will be collected and graded. However, students must work on all assigned problems in order to master the material.

HOMEWORK RULES: Submitted assignments must be

1. Written in clear English, either typed or written in ink on one side of paper,
2. Representing your OWN work (see below for further clarification),
3. Stapled.

Students may discuss the homework assignments. However, each student must write the solutions in their own words, and be ready to demonstrate a complete understanding of what is written upon request. It is not permissible for one student to copy all or part of a solution from another student or from other sources. If there is evidence of such copying, all who are involved will receive 0 points on the whole homework assignment. A second such infraction will be reported to CASL. For more information visit <http://umdearborn.edu/697817/>.

LATE HOMEWORK: Late homework will be penalized 10 % per day. No homework will be accepted after I post the solutions. If a student needs an extension, a request for this must be made prior to the due date.

MID-TERM EXAMS: These exams will be given in class, according to the following schedule (subject to change): **Exam 1** Tuesday, February 23; **Exam 2** Thursday, March 31.

FINAL EXAM: The final exam will be on Thursday, April 21, starting 3:00 pm. This exam will be comprehensive.

MISSED EXAMS POLICY: Missing an exam is permitted only for very serious and unavoidable extenuating circumstances, and only if a student notifies me in advance. In all cases of absence from exams a written excuse is required. Otherwise the student will get a score of 0 on the exam. Even if the student is excused from taking the exam, a makeup will not be given. Instead, the student's grade on the final exam will be used in place of the missed midterm exam. Except in truly exceptional situations, a student who misses the final exam will fail the course.

PROGRAM GOALS: The Department of Mathematics and Statistics Learning Goals for its classes are itemized below. 1) Increase students' command of problem-solving tools and facility in using problem-solving strategies, through classroom exposure and through experience with problems within and outside mathematics. 2) Increase students' ability to communicate and work cooperatively. 3) Increase students' ability to use technology and to learn from the use of technology, including improving their ability to make calculations and appropriate decisions about the type of calculations to make. 4) Increase student's

knowledge of the history and nature of mathematics. Provide students with an understanding of how mathematics is done and learned so that students become self-reliant learners and effective users of mathematics.

ANNOUNCEMENTS AND UPDATES: All announcements and updates will be either posted on Canvas, made in class or communicated through e-mail.

IMPORTANT DATES: Last day to drop and add with no penalty, January 20, 2016. Last day for selective drop is March 16, 2016. Last day to totally withdraw from all classes, April 19, 2016. Students may purchase tuition insurance should a medical emergency arise. The information about this program is here: https://umdearborn.edu/rr_tuition-fees-refund-plan

UNIVERSITY ATTENDANCE POLICY: A student is expected to attend every class and laboratory for which he or she has registered. Each instructor may make known to the student his or her policy with respect to absences in the course. It is the student's responsibility to be aware of this policy. The instructor makes the final decision to excuse or not to excuse an absence. An instructor is entitled to give a failing grade (E) for excessive absences or an Unofficial Drop (UE) for a student who stops attending class at some point during the semester. **ATTENDANCE POLICY FOR THIS CLASS:** Attendance counts for 1% of the final grade. In addition, attendance will have impact on border-line grades.

DISABILITY STATEMENT: The University will make reasonable accommodations for persons with documented disabilities. Students need to register with Disability Resource Services (DRS) every semester they are enrolled. DRS is located in Counseling & Support Services, 2157 UC (http://www.umd.umich.edu/cs_disability/). To be assured of having services when they are needed, students should register no later than the end of the add/drop deadline of each term. If you have a disability that necessitates an accommodation or adjustment to the academic requirements stated in this syllabus, you must register with DRS as described above and notify your professor.

NON-DISCRIMINATION POLICY: The University of Michigan is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, national origin, age, marital status, sex, sexual orientation, gender identity, gender expression, disability, religion, height, weight, or veteran status in employment, educational programs and activities, and admissions. Inquiries or complaints may be addressed to the Senior Director for Institutional Equity, and Title IX/Section 504/ADA Coordinator, Office for Institutional Equity, 2072 Administrative Services Building, Ann Arbor, Michigan 48109-1432, 734-763-0235, TTY 734-647-1388, institutional.equity@umich.edu.

EMAIL COMMUNICATION:

DO'S

- Read [##### **DON'TS**](http://www.wikihow.com>Email-a-Professor;• Include the course number in the subject of your e-mail;</div><div data-bbox=)

- Do not send me e-mails through Canvas!

INCOMPLETES: These will be given only in extraordinary circumstances. More precisely, I will consider giving you an incomplete if you have successfully completed all but a small portion of the work of the course and some severe, unexpected event prevents you from completing the course. This means

that you must have taken at least 1 midterm and must be doing work at the C level or better. You will have to sign a contract detailing what you have to do to complete the course. I will not give you an incomplete simply because you are behind in your work; in the latter case you should try to drop the course.

ACADEMIC INTEGRITY POLICY: The University of Michigan-Dearborn values academic honesty and integrity. Each student has a responsibility to understand, accept, and comply with the University's standards of academic conduct as set forth by the Code of Academic Conduct (<http://umdearborn.edu/697817/>), as well as policies established by each college. Cheating, collusion, misconduct, fabrication, and plagiarism are considered serious offenses and violations can result in penalties up to and including expulsion from the University.

COMMUNICATION AND ELECTRONIC DEVICES USAGE IN CLASS: The use of mobile communication devices and music players disrupts the class. Please be considerate of both your fellow students and your instructor and either turn-off or silence your cell phones, pagers, PDAs, or similar communication devices and turn-off and put away your music players during scheduled classes. Given the fact that these same communication devices are an integral part of the University's emergency notification system, an exception to this policy would occur when numerous devices activate simultaneously. When this occurs, students may consult their devices to determine if a university emergency exists. If that is not the case, the devices should be immediately returned to silent mode and put away.

CAMPUS SAFETY:

- Program 911 into your cell phones. You should also program Public Safety's phone number (313) 593-5333 into your cell phone. In case of emergency you should first dial 911. If the situation allows also call UM-Dearborn Public Safety to ensure the quickest response time possible.
- All students are strongly encouraged to register in the campus Emergency Alert System, for communications during an emergency. The following link includes information on registering as well as safety and emergency procedures information: <http://umemergencyalert.umd.umich.edu/>. Please note that the system will only communicate through an individual's UM-Dearborn email account so students who primarily use other non-university accounts should forward their UM-Dearborn email to their primary account.

TENTATIVE COURSE OUTLINE:

01/07-01/14	1. Complex numbers
01/19-02/02	2. Analytic functions
02/04-02/16	3.+8. Elementary functions and their mappings
02/18-03/10	4. Integrals
02/23	Midterm Exam 1
03/15-03/29	5. Series
03/31	Midterm Exam 2
04/05-04/14	6.+7. Residues and Poles; Applications
04/19	Review
04/21	Final Exam