

Youngstown STATE UNIVERSITY

Department of Mathematics and Statistics Course Outline for Mathematics 4875/6975

Table of Contents

Course Title.....	1
Course Number	1
Semester.....	1
Course Credit	1
Text	1
Course Prerequisite	1
Course Description.....	1
Course Objectives	2
Learning Outcomes	2
Faculty Evaluations.....	2
Honors Contracts	2
YSU Policies.....	2
Important Semester Dates	3
Mathematics Assistance Center (MAC)	3
Additional Information	3
Faculty Information	3
Grading Policy	4
Course Topics	4

Course Title: Complex Analysis

Course Number: MATH 4875/6975

Semester: Spring 2020

Course Credit: 3 s.h.

Text: Invitation to Complex Analysis, 2nd edition; Harold P. Boas, MAA

Course Prerequisite: MATH 3751

Course Description: This course is an introduction to the study of complex analysis. The main concepts to be studied include complex numbers and their geometric representation, analytic functions, contour integration, series, residues and poles, and conformal mappings.

Course Objectives:

- Students will develop an understanding of the fundamental concepts of complex analysis.
- Students will develop critical thinking skills such as defining terms, solving problems, generating and organizing hypotheses, developing and evaluating evidence and arguments, detecting errors and fallacies, exploring issues from multiple mathematical perspectives, identifying and questioning assumptions, and applying knowledge to new situations.
- Students will continue to develop the ability to read and understand advanced mathematical definitions, theorems and proofs. Students will continue to develop the ability to communicate in mathematics and produce well-written proofs.

Learning Outcomes:

- Students will be able to understand arithmetic operations of complex numbers both algebraically and geometrically.
- Students will understand the significance of a function having a derivative everywhere in a region of the complex plane.
- Students will understand the power of Cauchy's Integral Theorem from its implications.
- Students will be able to use contour integration to evaluate integrals that would be difficult to evaluate by other means.

Faculty Evaluations: At the end of the semester you will be asked to evaluate the instructor and the course in general. We ask that you take these evaluations seriously and provide honest feedback as these are reviewed by the Chair of the Department of Mathematics and Statistics.

Honors Contracts: Honors students may contract this course for honors credit. Notify your instructor of your interest to discuss options, complete required paperwork, and submit to instructor by the semester deadline.

YSU Policies:

Students with Disabilities: In accordance with University procedures, if you have a documented disability and require accommodations to obtain equal access in this course; please contact me privately to discuss your specific needs. You must be registered with the Center for Student Progress Disability Services, located in Kilcawley Center – RM 2082, and provide a letter of accommodation to coordinate reasonable accommodations. You can reach CSP Disability Services at 330-941-1372.

Non-Discrimination from the University: Youngstown State University does not discriminate on the basis of race, color, national origin, sex, sexual orientation, gender identity and/or expression, disability, age, religion or veteran/military status in its programs or activities. Please visit www.yсу.edu/ada-accessibility for contact information for persons designated to handle questions about this policy.

Academic Integrity: As outlined in The Student Code of Conduct, all forms of academic dishonesty are prohibited at Youngstown State. This includes plagiarism, the unauthorized use of tools or notes in taking tests or completing assignments, fabrication of data or information used for an assignment, working with others without permission from the instructor, and more. A student who is believed to have violated the academic integrity policy will meet with the instructor to discuss the allegations. The student may accept responsibility for the violation and any sanctions selected by the instructor, or they have the right to ask for a hearing before a hearing panel. The full Academic Integrity policy can be found in Article III. 1. of The Student Code of Conduct, while further information on University procedures for alleged academic integrity violations can be found in Article V.

Cancelled Class Policy: If this class is being cancelled for any one day because of instructor illness, or other reasons, a notice will be sent to your YSU email address as soon as possible. University-wide class cancellation is a decision made by the President's Office, and officially announced via the YSU homepage and on WYSU (88.5 FM) radio. Students may also register at the YSU Portal to receive a text message about University-wide closures via the Emergency Alert Notification System. Please familiarize yourself with the University's Cancellation and Closing Procedures: <https://ysu.edu/cancellation-and-closing-procedures>.

Important Semester Dates:

- Monday, January 13, 2020 – Term Begins
- Monday, January 20, 2020 – Martin Luther King Day (University closed)
- Tuesday, January 21, 2020 – The last day to add a class or change the grade option
- Sunday, January 26, 2020 – The last day to withdraw with a full refund
- Monday, March 9 through Sunday, March 15, 2020 – Spring Break
- Wednesday, March 25, 2020 – The last day to drop the course with a grade of “W”
- Monday, May 4 through Saturday, May 9, 2020 – Final Exams
- Saturday, May 9, 2020 – Term Ends

Mathematics Assistance Center (MAC):

For all your mathematics needs:

- Tutoring
- Solutions Manuals
- Computers
- Study Area

Location: Lincoln Building / Room 408

Website: MAC Webpage

(<https://cms.ysu.edu/mathematics-assistance-center/math-assistance-center>)

Email: mathassist@ysu.edu

Phone: 330-941-3274

Hours: Monday – Thursday 9:00 am – 6:00 pm

Friday 9:00 am – 3:00 pm

Check for services available for your course.

Additional Information:

[The Penguin Service Center](#) - A One Stop for Campus is an enrollment resource established to help students access and manage their academic record and student accounts. Please visit the Penguin Service Center or call (330) 941-6000 for assistance with financial aid, records access, registration processes, and tuition charges/billing. The office is located on the second floor of Meshel Hall.

[College/University Career Advisement](#)

[University Counseling Services](#)

The following information is provided by your instructor:

Faculty Information:

Instructor:	Dr. Eric J. Wingler
Office Location:	536 Lincoln Building
Email:	ejwingler@ysu.edu
Phone:	330-941-1817
Office Hours:	Monday – 1000–1050, 1300–1350 Wednesday – 1000–1050, 1300–1350 Friday – 1000–1050 (Or by appointment)

Section Information	CRN: 26266, 26267, 26534 Days/Times: MWF, 1100–1150 Location: 115 Lincoln Building
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Grading Policy:

- An important component of doing mathematics is expressing your ideas in a clear and correct manner. With practice, you will become adept to communicating in mathematics. Responsible collaboration with your peers is encouraged, as it will help you to assess whether you are expressing your mathematical ideas well. It is also important to work independently.
- Your grade will be determined from class participation (20%), homework (20%), and exams (60%). While the final exam is not comprehensive, you still must be familiar with the concepts introduced throughout the course to perform adequately. If you are auditing the course, you must attend at least 40% of the time to receive the grade AU; otherwise you will receive the grade W. Students taking Math 6975 will be expected to do more work than those taking Math 5875.
- If you have a valid reason for missing an exam, you will be given a makeup. If possible, you should notify the instructor in advance of missing an exam to make arrangements to take a makeup.
- On all exams it is expected that you will do your own work and not copy from others. Failure to comply with this policy may result in losing a significant amount of credit and could result in being assigned a failing grade for the course. On homework it is permissible to work in groups, but do not cheat yourself out of a learning experience by letting another person do all the work. Homework turned in late is subject to a slight reduction in credit (up to 20%) with the amount of reduction dependent on the degree of lateness. Generally, if your work on a homework assignment is substantially below perfect, you will be given a chance to redo the assignment for slightly less than full credit.
- The following grading scale will be used.

88 - 100%	A
76 - 87%	B (at least)
64 - 75%	C (at least)
50 - 63%	D (at least)
Below 50%	F (at least)

Course Topics: 1-16, 17 (A-C)

Topic(s)
Analytic functions of a complex variable
Cauchy-Riemann equations
Power series and Laurent series
Contour integration
Cauchy's formula
Residues and poles
The Casorati-Weierstrass Theorem

