

Andrews University

MATH 408 COMPLEX ANALYSIS SPRING 2017

This syllabus is subject to change. Subsequent versions will be uploaded and available in iVUE.

SCHEDULE INFORMATION

Class location: HYH 113

Class time/day: 2:00-3:15 T,Th

Credits offered: 3

INSTRUCTOR CONTACT

Instructor: Dr. Yun Myung Oh

(Email) ohy@andrews.edu

Office location: HYH 124

Office hours: 10:30-11:20 MWF & 11:20-12:20 M-Th or by appointment

URL: <https://www.andrews.edu/~ohy/408h/MATH408.html> (Please check for any class announcement here.)

COURSE DESCRIPTION

Elementary complex analysis, contour integrals, complex series

Prerequisite: MATH 240, Math 355

- Complex Numbers: operations, algebraic properties, moduli, exponential forms, arguments, roots of complex numbers, regions in the complex plane
 - Analytic functions: functions of complex variables, mappings, limits, continuity, derivatives, differentiation rules, Cauchy-Riemann equation, harmonic functions
 - Elementary functions: exponential functions, logarithmic functions, identities for logarithmic functions, complex exponents, trigonometric functions, hyperbolic functions, inverse trigonometric functions
 - Integrals: integrals of complex valued functions, contour integrals, Cauchy-Goursat theorem, Cauchy-integral formula, Liouville's theorem, fundamental theorem of algebra, maximum modulus theorem
 - Series: convergence of sequences & series, Taylor series, Laurant series
 - Residues and poles: Cauchy residue theorem, residues at poles, three types of isolated singular points
 - Applications of residues: Argument principle, improper integrals, Rouches theorem, Poisson integral formula
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COURSE MATERIALS

Required: Complex Variables and Applications (9th) by Ruel V. Churchill and James Ward Brown

DEGREE/PROGRAM LEARNING OUTCOMES

The course objectives contribute toward all of the degree/program learning outcomes in mathematics:

- Demonstrate breadth and depth in undergraduate mathematics
- Conduct research projects, write papers, and make presentations

- Prepare for success in graduate school and in teaching
- Demonstrate a good understanding of the material in the context of a commitment to Christ and the church
- Demonstrate a good understanding of the material in the context of learning to teach and communicate clearly

STUDENT LEARNING OUTCOMES (SLO)

The student should be able to:

- Represent complex numbers algebraically and geometrically,
- Define and analyze limits and continuity for complex functions as well as consequences of continuity,
- Apply the concept and consequences of analyticity and the Cauchy-Riemann equations and of results on harmonic and entire functions including the fundamental theorem of algebra,
- Analyze sequences and series of analytic functions and types of convergence,
- Evaluate complex contour integrals directly and by the fundamental theorem, apply the Cauchy integral theorem in its various versions, and the Cauchy integral formula, and
- Represent functions as Taylor, power and Laurent series, classify singularities and poles, find residues and evaluate complex integrals using the residue theorem.

LIST OF ASSIGNMENTS & EXAM SCHEDULES

Please check out the class page <http://www.andrews.edu/~ohy/408h/MATH408.html> for the class announcements & due of assignments.

GRADING CRITERIA

Criteria for Grades

A course percentage grade will be calculated from homework (20%) & quiz & worksheets (10% each), the midterm exams (40%), and the Final Exam (20%). The final grade is determined by the scale:

90-100 A; 87-89 A-; 83-86 B+; 80-82 B; 77-79 B-; 73-76 C+; 70-72 C; 63-69 C-; 60-62 D; 0-59 F

Cutoffs may be lower if warranted. A grade of "I" is available only under the conditions stated in the Bulletin.

Assignment Submission

- Any homework assignment is due *at the beginning* of every Tuesday's class. If you are late for the class, your HW is late.
- There will be a quiz at the beginning of every Thursday's class and no make-up is available.
- You can use your note and textbook for all worksheets provided in class and these should be finished in class unless other instructions are announced.
- Solutions lacking neatness and/or proper evidence will be discounted at the grader's discretion and you must have your name, your box number and assignment number written clearly on every assignment.
- If you have a field trip for another class, ask your teacher to send me an email beforehand and you should turn in your assignment before you leave.
- Collaboration on homework is permitted and even encouraged, but **each student must independently write up his or her own solutions** and any two identical works will receive no credit. There is no collaboration on exams.

Late Submission

No late homework and take-home quiz are accepted for any reason. Instead, up to three times, your missed homework will be excused if you can bring me some **valid official document** when you have some emergencies. **NO MORE THREE EXCUSES WILL BE ALLOWED FOR THE SEMESTER.**

Exam Guidelines

There will be one midterm exam. Make up exam will not be given without an *excuse from the proper authority*. The comprehensive Final Exam is Thu, **May4, 2017 at 13:30pm-15:30pm in HYH114**.

CLASS POLICIES

Professionalism

To prepare students for the professional world, certain behaviors/activities are not allowed in the classroom.

- **Phones must be silent and out of sight during class time.** Picture-taking during class is not allowed. Recording devices are allowed only if pre-approved by instructor, and if approved, under no circumstance are recordings—visual or verbal—to be posted on a public website.
- Laptops should not be used for surfing the web or watching movies during class. It is disrespectful and unprofessional to use these devices inappropriately during class.
- Eating in class: Please do not bring food or beverages to class. Water is permitted.
- Active participation in class discussions and critiques is an essential part of learning. Without participating and expressing opinions and thoughts, it is impossible to clarify your goals and develop a personal style.

Disability Accommodations

If you qualify for accommodation under the American Disabilities Act, please contact Student Success in Nethery Hall 100 (disabilities@andrews.edu or 269-471-6096) as soon as possible so that accommodations can be arranged.

Class Absences & Excused Absences

Whenever the number of absences exceeds 20% (10% for graduate classes) of the total course appointments, the teacher may give a failing grade. Merely being absent from campus does not exempt the student from this policy. Absences recorded because of late registration, suspension, and early/late vacation leaves are not excused. The class work missed may be made up only if the teacher allows. Three tardies are equal to one absence. Registered students are considered class members until they file a Change of Registration form in the Office of Academic records. Excuses for absences due to illness are granted by the teacher. Proof of illness is required. Residence hall students are required to see a nurse on the first day of any illness which interferes with class attendance. Non-residence hall students should show written verification of illness obtained from their own physician. Excuses for absences not due to illness are issued directly to the dean's office. Excused absences do not remove the student's responsibility to complete all requirements of a course. Class work is made up by permission of the teacher.

Academic Integrity

In harmony with the mission statement, Andrews University expects that students will demonstrate the ability to think clearly for themselves and exhibit personal and moral integrity in every sphere of life. Thus, students are expected to display honesty in all academic matters.

Academic dishonesty includes (but is not limited to) the following acts:

- Falsifying or presenting falsified documents; Plagiarizing
- Misusing copyrighted material and/or violating licensing agreements
- Using media from any source or device including the internet in ways that mislead, deceive, or defraud
- Presenting another person's work as one's own
- Using materials other than those specifically allowed by the teacher or program during a quiz or examination
- Stealing, accepting, or studying from stolen quizzes or examination materials
- Obtaining information from another student or any other source during a regular or take home test or quiz
- Assisting others in acts of academic dishonesty such as falsifying attendance records or providing unauthorized course materials
- Acting deceitful in any other academic matter

Emergency Protocol

Andrews University takes the safety of its student seriously. Signs identifying emergency protocol are posted throughout buildings. Instructors will provide guidance and direction to students in the classroom in the event of an emergency affecting that specific location. It is important that you follow these instructions and stay with your instructor during any evacuation or sheltering emergency.