Math 410, Fall 2010

Introduction to Complex Analysis

Instructor: John Zweck
Office: MP 424
Email: zweck@umbc.edu
Webpage: I will maintain a web page for the course, linked from my web page www.math.umbc.edu/~zweck. I will also communicate with you using a class email list.
Phone: (410) 455 2424 (Do not leave messages, email instead!)
Fax: (410) 455 1066
Lectures: TuTh, 2:30-3:45 (MP 008)
Text: “Fundamentals of Complex Analysis with Applications to Engineering and Science” by E.B. Saff and A.D. Snider, Prentice Hall; 3rd edition (2003). We will cover Chapters 1-8, omitting a few sections.
Prerequisite: Math 251 (Multivariable Calculus). It is also recommend that students have taken Math 301 (Introduction to Mathematical Analysis).
Office Hours: Tu 1:30-2:20, Th 1:30-2:20 and by appointment. If you cannot come to my office hours please contact me in class or by email/phone to set up a time to meet. Also, you are encouraged to ask me questions by email/phone.
Study Groups: In the first week of class I will organize students into study groups.
Drop Deadlines: The first drop day is Sept. 14th, after which it is impossible to drop without a “W”. The second and last drop day is Nov. 12th.

Learning Goals

Students will learn how to apply ideas and techniques from Calculus to formulate the definition of a complex analytic function and to study special properties of complex analytic functions. These properties will then be applied to solve problems arising in engineering and physics. Students will be challenged to improve their problem solving skills within the broad context of Calculus.

Homework and exams will emphasize calculations for specific examples based on the theory discussed in class, as well as some more abstract proofs based on similar sorts of calculations to the ones performed in class. Exams will also test your understanding of definitions, theorems and some proofs of material covered in class.
Academic Misconduct

I will not tolerate cheating in any form. All instances of cheating I discover will be reported to UMBC’s academic integrity committee. (See http://www.umbc.edu/integrity/) In particular, in this course, giving or receiving aid on exams will result in a grade of zero for that exam. Copying of homework solutions from other students in the class, from students who have previously taken this or an equivalent course, from a solutions manual, or from the web will treated as a serious offense and may result in a grade of zero for all homework for the semester. In addition, cheating on exams or homework may be further penalized by a reduction in the final letter grade for the course, or by the student receiving an F for the course.

Here is a summary of UMBC’s official policy on academic misconduct, which I fully endorse:

By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC’s scholarly community in which everyone’s academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. To read the full Student Academic Conduct Policy, consult the UMBC Student Handbook, the Faculty Handbook, or the UMBC Policies section of the UMBC Directory.

Grading

Grades: Homework 10%, Midterm One 25%, Midterm Two 30%, Final 35%

Homework: Even though homework does not count for much, there is a strong correlation between mastery of homework problems and performance on exams. The homework problems will be posted on the course web page for each day of class. Problems assigned on Tuesday and Thursday will be due at the start of class the following Thursday. At least some of them will be graded. Make sure your homework paper is stapled. No late homework will be accepted! Your lowest two homework grades will be dropped. You may ask me questions about the homework and you may collaborate with another student in the class. In fact you are encouraged to do so! However the final write up is your own – two (almost) identical solutions may both be given zero. I do not encourage large groups of people to work together on homework. Do not miss class to complete a homework. I will not accept homework that is handed in after the first few minutes of class.

Midterm Exams: There will be two midterm exams.

- Midterm 1: Tuesday October 7th
- Midterm 2: Thursday November 11th

Final Exam: Thursday December 16th, 1-3pm in MP 008. The final will be based on the whole course and may be harder than midterms.
Making up an exam you missed

If you miss one of the midterms you may be given the chance to take a make up exam. To request a make up you should speak with me no later than 48 hours after the exam time. Generally speaking, you will be offered a make up if you are sick or if a close relative or friend is gravely injured/sick or dies. However I will listen to all reasonable requests. Be prepared to bring appropriate evidence in support of your request. There will be no make ups for the final exam.

How I assign final grades

For each exam I work out how many points I expect a student who has a solid understanding of the material to get. I tend to put the bottom B near this score. Then I work out where to place the bottom A,C,D using the grade distribution and by looking at individual exams. I also work out the bottom A,B,C,D for the homework, and presentations. Then I take an imaginary student who got the bottom B (say) for each component of the course and calculate their score. If your score is higher than the imaginary student’s you get a B. If it is a little less than the imaginary student’s score I look carefully at your work to decide whether you deserve a B or a C. Most importantly I look at your final exam and your homework. In particular, students on the borderline between two grades and who show mastery of the material on the final are more likely to receive the higher grade. However, students who do very poorly on the final might find that their course grade is lower than they had expected!

As you can see I place quite a bit of emphasis on the final exam. In short I reward “strong finishers” who can show me they have a solid understanding of the entire course.

Study Tips

1. Warning: This course gets harder as the semester progresses. My experience is that student who receive a C on the midterms are in grave danger of getting D/F on the final and in the course. To do as well as you can, I strongly encourage you to come to see me with specific questions on a regular basis.

2. On the course web page I will post the sections that we will cover each day. You are expected to read the section ahead of time.

3. It is very important to keep the main definitions, statements of theorems, and simpler examples on the forefront of your minds throughout the course, since we will refer back to them many times. You will need to digest the material several times to master it — before class, in class, reading through material after class, rederiving for yourself without any aid results discussed in class, and doing the assigned problems.

4. This is a fast paced course. Do not get behind. Do not miss class. If you miss a class or start to get lost, it will only be a week before you are totally lost. So ask for help from me and from your fellow students immediately!
5. I encourage you to ask questions both in and out of class. If you are dazed and confused most likely most of your class mates are too! So you’ll be doing everyone a favor by asking your question.

6. In class I call on people by name to answer questions. This is to keep you involved and on your toes. It also helps me find out whether you are understanding what’s going on. If you do not feel comfortable being called on in class, please come and talk with me, and we will find another way to actively involve you.

7. Come and talk with me in my office. Talk math with your fellow students, don’t work in isolation.

8. Learn the art of taking good notes. My lectures often present a complementary perspective to that in the textbook.

Advice for Homework

1. Never start your homework the day before it is due!!

2. Do all the hwk problems. Learn from your mistakes on the graded hwk.

3. Write up your homework so that you’ll easily understand it weeks later.

4. The only way to learn math is to do it: Struggle to solve problems for yourself.

5. However, if you get stuck on a problem for too long get help and get it before you waste too much time!! Here are some places you can go for help.
   
   • Carefully read your notes from lectures and the book (again!).
   • Draw a schematic picture to help you think about the problem.
   • Ask me for help by email or in person.
   • Ask a fellow class member – often two heads are better than one! I encourage you to find a study partner for this class. First attempt the hwk yourself, then discuss them with your study partner, and finally carefully write the solutions up in your own words.
   • Sleep on it. Some of my best ideas come when I wake up in the morning.

Advice for Exams

Study in small groups for exams and learn from each other. Presenting material to someone else is often the best way to work out whether you really know it yourself. Exams will cover theory covered in class (definitions, theorems, examples) and problems similar to those in the homework and in the textbook. Old exams (some with solutions) are available on the course web page.

I encourage you to first master the theory and memorize calculation methods and formulae you need to know and then use this knowledge to work a range of problems without looking at your notes. To learn theory, calculation methods, and formulae go through your notes and the book and write down a detailed list of topics you need to know. Then with your lecture notes and book closed write down what you know about each topic, as precisely and succinctly as you can. Only when you get stuck should you look at your lecture notes. If you do this about 4 times in the 10 days prior to the exam you should be in good shape. Don’t forget to work lots of problems as well!

You should also spend some but not all of your preparation time studying in small groups to learn from each other. Presenting material to someone else is often the best way to work out whether you really know it yourself.