Syllabus for MA433G001 F 2011

Handouts and additional materials for the class are available here

MA433G Introduction to Complex Variables is a first course in complex analysis. Here is summary contact information as well as times and locations of class meetings and the like.

MA 433G Section 1	Lecture
Instructor	Ken Kubota
Office	955 P.O.T.
Phone	257-3641
E-Mail	ken@ms.uky.edu
Office Hours	M12-1
Mathskeller Hours	W12-1
Class	MWF 11 CB341

In addition to normal Office Hours and Mathskeller Hours, you can also make appointments to see the instructor or just drop by his office. Also, if you feel that a group problem session is preferable, just ask that it be organized.
There will be two examinations scheduled during the semester and will likely be in-class. In addition, there will be a comprehensive **final examination.**

Exam	Time	Location
Exam 1	11:00	341 CB
Exam 2	11:00	341 CB
Final	Fri 12/16 1:00-3:00 P.M	341 CB

Generalities: MA214 is a first course in complex variables and assumes that one has already studied three semesters of calculus. Its prerequisite is MA 213 (Calculus III) or consent of instructor.
Credit: MA433G earns three credit hours.
Instructor and Class Meetings: Lectures are MWF 11:00-11:50 in CB 341. Attendance at all lectures is required.
Textbook: The textbook is *Complex Variables and Applications, Second Edition* by Ruel Churchill, McGraw Hill, Inc., 1960. This is a classic textbook and an excellent value, currently sold used at amazon.com for less than $10.00. Get a copy of the textbook; one of the objects of this course is to learn how to read a math textbook.
Homework: Homework will be assigned and posted on the MathClass website (**www.mathclass.org/**. Some homework will be hand graded and others will be machine graded using the mathclass software. Students all have accounts on this website and are expected to check there to download homework assignments and other materials. Computer computation will be required for the course; and can done principally using a JavaScript calculator page on the mathclass website.
Examinations: There will be two examinations and one final exam. The examinations will typically be scheduled during a lecture, the date being announced at least a week in advance. Each of the examinations will be focused primarily on the material from the lectures, recitation, and homework for that exam. However, students are responsible for all material covered up to that exam, including material from previous exam periods. The final will be over all the material of the class.
Exams are paper tests and will be hand-graded by the instructor whose primary concern will be an evaluation of the understanding of the material communicated by the student's work. Students are both permitted and expected to use calculators on the examinations for routine arithmetic and built-in function evaluation. Sophisticated features may be used for to gain intuition about a problem or for cross-checking answers. However, `answers' simply taken as output from calculator routines will generally not receive any credit.
Course Topics: The course will study complex numbers and functions of a complex variables. Although one will be developing ideas and skills in working with complex numbers, we will see that the real value of the exercise is that it gives a powerful means for solving difficult problems in the real domain. Here is a brief list of the main points and the correspondence to the textbook chapters.

a. Chapters 1: What is a complex number and how do you operate arithmetically with them. The geometric interpretation of these operations. Just knowing the algebra of complex numbers is enough to solve the problem of solving cubic and quartic equations.
b. Chapter 2: What is the derivative of a complex valued function of a complex variable? We will see that being differentiable is a far more stringent condition for complex functions than for real ones. The good news is that almost all of the useful ones do satisfy this condition.
c. Chapter 3 and 4: What are the complex extensions of the various real functions familiar from calculus? It turns out that each of these functions has a uniquely determined natural extension to complex numbers which is differentiable. Furthermore, the real exponential and trig functions (both circular and hyperbolic) turn out to be just parts of the complex exponential function.
d. Chapter 5, 6, and 7: Studying line integrals will give deep insights into the nature of a differentiable function of a complex variable. In particular, it gives one the ability to represent such functions as power series and almost reduces the study of complex functions to algebra. This will all be used to develop a complex variable method for evaluating hard definite integrals of functions of a real variable -- further applications of this powerful theory will take up whatever is left of the semester.

Grades: There are a total of **400 points** to be earned in the course. The grading scale is:

A At least 90% or at least 360 points

B At least 80% or at least 320 points

C At least 70% or at least 280 points

D At least 60% or at least 240 points

E Below 60% or below 240 points

These points can be earned through the following activities:

Exams and Final	300 points	75% of course grade
Homework and other projects	100 points	25% of course grade
Total	400 points	100% of course grade

The above point distributions are nominal and approximate; they may need to be tuned during the semester.

modified: Saturday, August 20, 2011

Back Print
Modified 1/18/2008 12:55