

Introduction to Functions of One Complex Variable

Math 4520.001/5400.001, Fall 2014, MWF 10:00-10:50, Lang 314

Professor: Dr. Conley, GAB 419, 565-3326, conley@unt.edu. Assignments and announcements will be posted at www.math.unt.edu/~conley.

Office Hours: MW 11:00-12:30, F 11:00-12:00

Text and Prerequisites: The text is *Complex Analysis for Mathematics and Engineering*, sixth edition, by Mathews and Howell. The prerequisites are Math 1710-20 and 2730, the calculus sequence.

Exams, Homework, and Grading: There will be two 100 point midterms, on the Wednesdays of October 1 and November 5, and a comprehensive 180 point final on Friday, December 12, 8:00-10:00. There will also be thirteen problem sets, usually worth 10 points and due Fridays at the beginning of class. There will be no make-up exams, and late homework will not be accepted.

5400: Graduate students enrolled in 5400 will be given some extra weekly problems, and possibly an extra problem on each exam.

Disabled Students: Please tell me about your disability after the first lecture.

Topics: We will begin by going over multiplication of complex numbers in rectangular and polar coordinates. Then we will study differentiability of functions of one complex variable, followed by Taylor and Laurent series and contour integration. We will also discuss conformal maps and Julia and Mandelbrot sets if time permits. We will give some rigorous proofs, but no prior exposure to proofs will be assumed. Concrete examples and calculations will be emphasized.

Chapters 1-2: Complex numbers, functions, and graphs.

Chapters 3-5: Analytic and harmonic functions, power series functions, and the elementary functions such as e^z .

Chapters 6-8: Complex integration, contour integration, and Taylor and Laurent series. These chapters contain many surprising and beautiful theorems and form the centerpiece of the course.

Problem Set 1 (due Friday, August 29):

Section 1.2: 1abef, 2cfh, 3, 5, 6

Section 1.3: 1, 2a, 3b, 5, 6ab, 9, 11, 12

Section 1.4: 1abdeh, 2b, 3abcd, 5fg

5400 Problems: 1.3.18, 1.4.4, 1.4.8

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MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8/25 First class day	8/26	8/27	8/28	8/29 HW 1 Last day to add or swap
9/1 Labor Day: no classes	9/2	9/3	9/4	9/5 HW 2
9/8 Last day to drop with refund	9/9	9/10	9/11	9/12 HW 3
9/15	9/16	9/17	9/18	9/19 HW 4 Skype class
9/22 Skype class	9/23	9/24	9/25	9/26 HW 5
9/29	9/30	10/1 Exam I	10/2	10/3
10/6	10/7	10/8	10/9	10/10 HW 6
10/1	10/14	10/15	10/16	10/17 HW 7
10/20	10/21	10/22	10/23	10/24 HW 8
10/27	10/28	10/29	10/30	10/31 HW 9
11/3	11/4	11/5 Exam II	11/6	11/7 Skype class
11/10	11/11	11/12	11/13	11/14 HW 10
11/17	11/18	11/19	11/20	11/21 HW 11
11/24	11/25	11/26 HW 12	11/27 Thanksgiving Holiday	11/28 No classes
12/1	12/2	12/3 HW 13	12/4	12/5 Reading Day: no class
12/8	12/9	12/10	12/11	12/12 Final Exam: 8:00-10:00

Note: Skype classes will meet in our regular room, but I will be away and communicating via skype screen-connect and a pen tablet (simulating a chalk board, like a Khan Academy class, but live and with two-way audio contact). One of you will log on to the classroom computer with their usual UNT EUID and password, open Skype, and log in with my teaching Skype account. This is a Microsoft account, not a regular Skype account, so you might need to click “sign in with a different account” and choose “Microsoft account”. Once you get to the Microsoft account Skype sign in page, enter conley@unt.edu and use GAB419teach! for the password.

We will be using a wireless microphone for you to talk to me. One of you will need to bring it to class: don’t forget, because the classroom computers don’t have mics. We will practice with it in advance, but here are a few reminders. You hold down the power button to turn on the mic, and press it to toggle mute. It must be synchronized with the base unit (the Shure transceiver in the computer rack), i.e., set to the same channel. This is done by holding the mic up to the transceiver and pushing the big grey button on the right side of the transceiver. We will do it before I leave, but remember how to do it in case somehow it desynchronizes.

If there are problems, call me at 940 206 5035. (I have done this before several times. There are usually minor problems which we get past without too much trouble.)