Introduction to Functions of One Complex Variable

Math 4520.001/5400.001, Fall 2023, MWF 10:00-10:50, BLB 255

Professor: Dr. Conley, GAB 419, conley@unt.edu.

Website: There will be no Canvas page for the course. Assignments and announcements will be posted at www.math.unt.edu/∼conley.

Office Hours: MW 11:15-11:45 and 1:30-2:30, F 11:30-12:30. If you cannot make it to any of those times, please let me know.

Text: The text is *Complex Analysis for Mathematics and Engineering,* sixth edition, by Mathews and Howell. It is required.

Prerequisites: The prerequisites are Math 1710-20 and 2730, the calculus sequence. If you did not get at least a B in all three of those courses, or if you took them somewhere other than UNT, please talk to me after the first class so we can make sure you are properly prepared for this course.

Exams: There will be two 100 point midterms, on the Wednesdays of September 27 and November 1, and a comprehensive 200 point final on Saturday, December 9, 8:00-10:00. There will be no make-up exams.

Homework and Quizzes: There will be thirteen problem sets. These will not be collected, but there will be corresponding quizzes, usually given on Fridays (see the calendar), 10 to 20 minutes long, and worth 10 points each. There will be no make-up quizzes, but your lowest three quiz scores will be dropped.

Grading: Grades will be based on your total score in the course. There are 500 points possible altogether. The percentage necessary for each letter grade will not be 90/80/70/60 — the curve will be more generous than that. After each exam I will announce the curve on the exam itself and also on all points available to date, so you will know how you are doing as the course progresses.

Math 5400 Students: 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. No prior exposure to proofs will be assumed; concrete examples and computations 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 (Quiz 1 will be Friday, August 25):

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

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

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

    Additional problems for 5400 students: 1.3.18, 1.4.4, 1.4.8

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MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8/21 Classes begin	8/22	8/23	8/24	8/25 Quiz 1 Last day to add or swap
8/28	8/29	8/30	8/31	9/1 Quiz 2
9/4 Labor Day	9/5	9/6	9/7	9/8 Quiz 3
9/11	9/12	9/13	9/14	9/15 Quiz 4
9/18	9/19	9/20	9/21	9/22 Quiz 5
9/25	9/26	9/27 Exam 1	9/28	9/29
10/2	10/3	10/4	10/5	10/6 Quiz 6
10/9	10/10	10/11	10/12	10/13 Quiz 7
10/16	10/17	10/18	10/19	10/20 Quiz 8
10/23	10/24	10/25	10/26	10/27 Quiz 9
10/30	10/31	11/1 Exam 2	11/2	11/3
11/6	11/7	11/8	11/9	11/10 Quiz 10 Last day to drop
11/13	11/14	11/15	11/16	11/17 Quiz 11
11/20 No classes	11/21 No classes	11/22 No classes	11/23 Thanksgiving	11/24 No classes
11/27	11/28	11/29	11/30	12/1 Quiz 12
12/4	12/5	12/6 Quiz 13	12/7	12/8 Reading Day: no classes

Final Exam (200 points, comprehensive): Saturday, December 9, 8:00-10:00