Math 4360 Syllabus
Complex Variables I
Spring 2016 Sul Ross State University

Secs. 001, MC1:	Mon, Wed: 2:00-3:15p in ACR 206
Instructor:	Dr. Kris Jorgenson
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Office Hours:	M, W, F: 10a-12p; Tu, Th: 11a-12p, 3:30–4:30p
	also available by appointment

Course Description: The prerequisite is Calculus III (Math 3415). This course is an introductory course covering functions of one complex variable. Topics will include: the algebra of complex numbers, geometry in the complex plane, polar representation of complex numbers, analytic functions, mappings, continuity, differentiability, Cauchy-Riemann equations, elementary functions of a complex variable, contour integrals and the Cauchy integral formula.

Student Learning Objectives Successful students will demonstrate correct understanding and knowledge of the topics including but not limited to those of the preceding paragraph through use of correct terminology, listing, identifying, and labeling. Students will translate, extend, synthesize, and apply concepts and problem-solving methods to different problem-solving situations. Students will demonstrate correct knowledge of the difference between numbers (perhaps in the context of another mathematical object such as a function or algebraic expression) that are in exact form and numbers that are approximate and will be able to report numbers in exact form and with a correct approximation when required. Students will express their solutions clearly in writing using complete sentences when appropriate.

This course is supportive of the
Program Learning Outcomes for the Bachelor of Science degree in Mathematics:
The graduating student will demonstrate that he/she is able to:
• Apply knowledge of basic mathematics principles;
• Identify and provide valid proofs or solutions for theorems and problems;
• Recognize and dispute invalid mathematical statements using counter-examples.

Required Textbook: Schaum's Outline of Complex Variables, by Murray R. Spiegel, et al., 2nd Edition, 2009, ISBN: 978-0-07-161569-3, McGraw-Hill Co., Inc.

Optional Resource: Complex Variables and Applications, by Ruel V. Churchill and James Ward Brown, any edition, McGraw-Hill Co., Inc.

Class Materials: Students are expected to be prepared in every class with pencils and paper to take notes of lecture content and examples, and you are required to be involved in

in-class assignments and discussion. This will be part of your grade.

Blackboard 9: Also you are required to have access to Blackboard 9 and have an e-mail address that you check regularly be your e-address registered in Bb 9 since I may need to contact you outside of class with important information.

Grading and Assignments: The assignments discussed below will help students achieve all of the Learning Objectives mentioned previously through active learning and assessment. Your total grade will break down as follows:

Grading: Your grade will be based on **homework grade** (worth 20%), **3 tests** (each worth 20%), and **Favorite Problem Presentation grade** (worth 20%).

The **tests** will be based on assigned homework and will be given on the following dates:

Test 1	Wed, Feb. 24
Test 2	Wed, April 6
Test 3	Wed, May 11: 3-5p in ACR 206

Favorite Problem Presentation grade Students will be asked to choose 2 favorite HW problems in each unit to teach to the other students in class. Each student's 6 problems are required to be different from other students' and must be approved by me. A student may choose a problem from outside the assigned HW with my approval. Both problems from a unit will be presented as time permits prior to the test day for this unit, but at least one will be presented in class for each unit. Each student's best 5 favorite problem grades will be counted toward this part of their grade so that each favorite problem will count for 4% of their total grade.

Late Work, **Rescheduled Quizzes**/**Tests** No late homework will be accepted, but I will accept homework as long as it is handed in by 5 pm on the due date. To take an in-class quiz or test at a time other than the scheduled time, you must notify me of this absence ON OR BEFORE THE DAY MISSED, and satisfy one of two requirements: either (1) supply a written medical excuse signed by a medical professional for the day of the absence, or (2) your excuse is for a university activity, in which case you must notify me of this authorized absence in writing with your name, the name of your organization and the date(s) of your absence, and your name must appear on a published explained absence list that I am provided (or this is verified by a faculty sponsor). Also, you and I must set up a time for you to make up the quiz or test within a reasonable time period (not more than 1 or 2 days) before or after the time of the missed grade. Usually I will let you make up a grade according to the above conditions if it is due to another one-time occurrence, such as the care of someone else in your family or a friend, or for a work-related excuse as long as you can document your absence and you let me know BY THE DAY OF THE ABSENCE AT THE LATEST.

Attendance I will be taking attendance as university policy precludes you from missing 3 weeks or more of classes for anything other than authorized university activities. To excuse an absence for a university activity, in addition to letting me know of the absence

by the day of the absence (as explained previously) you must also spend at least 60 minutes outside of class on this course with me or with a tutor, but they will need to sign a note that documents this made-up time. Also I will allow you to excuse a test day for a documented medical absence as long as you also make up the test. If you have 3 weeks or more of unexcused absences, I reserve the right to drop you from this class with a grade of 'F', which is university policy.

Good Advice Concentrate on learning the material of the course rather than worrying about your grade. Your time is best spent concentrating on the material to be learned in the impending assignments, asking questions, and devoting yourself to activities that will help you learn the material and do better in the course. I will worry about the details of your grade since you doing so does not help you earn a higher grade. But learning the material and doing well on the tests *will* help your grade. **Remember that math is not a spectator sport**, so the more problems you work yourself, the more practice you will get, the more confident you will be, and the better you will do in this course. Working on the problems helps you to figure out what your specific questions are.

More Good Advice Keep absences to a minimum. You never know when you might miss something you will find important either from the lecture or class discussion such as questions other students ask. Remember: YOU ARE RESPONSIBLE FOR EVERYTHING THAT IS DISCUSSED DURING CLASS WHETHER YOU ARE PRESENT OR NOT.

Also do not allow yourself to develop bad habits such as missing classes. It's human nature to be controlled by our habits, so once you develop a weekly habit for the semester, it can be hard to break this habit.   So be sure that you allow the necessary time for this course, ESPECIALLY if you consider mathematics not to be your best subject. If you have trouble in math, then you should attend EVERY class of a college mathematics course. Not showing up to class or not doing the required work will not cause this class to "go away". If you do have to miss, let me know before class, and plan to come and see me and make an appointment to discuss what was missed and pick up assignments you did not get back. However meeting in my office is not a substitute for attending class.

Ask questions no matter how easy or trivial they may seem. There is no such thing as a bad or silly question. Questions result when you are interested and have been thinking about areas, such as mathematics, in which you have some limitations in your educational background. Being in a college mathematics course means you will have questions both obvious and more subtle. Asking questions is a very important part of learning.

Study and work problems regularly–every day. Work on assignments discussed in class as soon as you can after class while the methods discussed are still fresh in mind. You can't expect to succeed in a math course by waiting till the last minute to only study and cram prior to a test. If you promise yourself you will study for ½-hour, get into the work, forget the clock, then the next thing you know, you've studied and worked for one to two hours.

Classroom Conduct It is important to conduct yourself in a college classroom so that everyone can benefit from good communication between instructor and students. My goal is to create a classroom environment in which everyone can do their best work, learn, and make the best grades possible.

I think you will find that I am a very friendly, sympathetic, and generous instructor as long as you are sincerely working to succeed in this course and certain guidelines for classroom behavior are followed during class to allow a sanctity of study for your fellow students. Class habits such as holding conversations during class lecture, or being engaged in activities not related to this course such as working on a different course or reading a newspaper will work against the goal of this course and cause you to be counted absent and you will lose Daily Grade credit. Also engaging with electronic communication devices of any kind during class or coming into class more than 5 minutes late or leaving early before class is dismissed circumvent the goals of this course and cause you to lose credit. My sympathy and generosity will quickly evaporate if I find that you are working against the goals of the course or that you are simply trying to get a good grade without learning or without honestly doing the required work. I want you to have every opportunity to succeed in this course.

Please be aware of the rules for Academic Honesty that you will find in the Sul Ross Student Handbook and building codes prohibiting food, beverages, tobacco (smokeless or otherwise) in the classroom. Use commonsense to think of anything else that will allow you to learn and do the best work that you can in this class, and for me to better help you do your best work. Remember that being registered for this course does not allow you to behave in any manner you wish during class. You must keep other people in mind. It is within university policy for me to send a student out of this class on a temporary or permanent basis if disruptions or interruptions like the types listed above persist.

Equal Access The university is committed to equal access in compliance with the Americans with Disabilities Act of 1990 (ADA) and section 504 of the Rehabilitation Act of 1973. If you have questions regarding accessibility, please consult with the Director of Counseling and Accessibility Services, Mary Schwartze, in Ferguson Hall Rm. 112, and feel free to discuss this with me in private. The mailing address is Accessibility Services, Box C-122, Sul Ross State University, Alpine, Texas 79832. The telephone number is (432) 837-8203. E-mail: mschwartze@sulross.edu.

Important University Dates

Tue, January 19	First day of classes; late registration, schedule changes begin
Fri, January 22	Last day for late registration and schedule changes
Wed, February 3	12th class day: last day to drop without creating record
Mon-Fri March 14-18	Spring Break Holiday, no classes
Fri, April 8	Last day to drop a course with grade of "W" by 4 pm in Registrar's Office
Mon, April 18	Honors Convocation, 7:30 pm in Marshall Auditorium
Wed, May 4	Last Class Day before finals
Thu, Fri May 5, 6	Dead Days, no classes
M-Th, May 9-12	Final Exams

Spring 2016	Math 4360 Complex Variables I Tentative Course Outline	
X = No Class	Mon	Wed
Jan. 20	X - MLK Day	Complex Numbers Arithmetic, Polar Forms
Jan. 25, 27	Complex Numbers Polynomial Equations	Complex Numbers Stereographic Projection
Feb. 1. 3	Functions, Limits, Continuity	Functions, Limits, Continuity
Feb. 8, 10	Functions, Limits, Continuity	Functions, Limits, Continuity
Feb. 15, 17	Complex Differentiation	Complex Differentiation
Feb. 22, 24	Review for Test 1	Test 1
Feb. 29, March 2	Complex Differentiation	Complex Differentiation
Mar. 7, 9	Complex Integration	Complex Integration
Mar. 14-18	X - SPRING BREAK	X - SPRING BREAK
Mar. 21, 23	Complex Integration	Complex Integration
Mar. 28, 30	Cauchy Integral Formulas	Cauchy Integral Formulas
Apr. 4, 6	Review for Test 2	Test 2
Apr. 11, 13	Cauchy Integral Formulas	Cauchy Integral Formulas
Apr. 18, 20	Residue Theorem Evaluation of Integrals	Residue Theorem Evaluation of Integrals
Apr. 25, 27	Residue Theorem Evaluation of Integrals	Conformal Mappings
May. 2, 4	Conformal Mappings	Review Test 3
Wed May 11	X - Finals Week	Test 3, 3-5 pm