MATH 438.001 - COMPLEX ANLAYSIS
TR 2:00PM-3:15PM BINNION 330
COURSE SYLLABUS: SPRING 2018

Instructor: Dr. Mehmet Celik
Office Location: Binnion 323
Office Hours: Mon. 12pm-2:00pm; Tues. 3:30pm-4:30pm; Wed. 12pm-2:00pm; Thur. 3:30pm-4:30pm; Friday 12pm-2:00pm or by appointment
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Preferred Form of Communication: email

COURSE INFORMATION

Materials
Textbook(s) Required: The main text is *A First Course in Complex Analysis* by Matthias Beck, Gerald Marchesi, Dennis Pixton, and Lucas Sabalka, version 1.5, it is free online at math.sfsu.edu/beck/papers/complex.pdf (chapter 1-9). A good source for many solved problems with solutions is *Schaum's Outline of Complex Variables*, second edition, by Murray R. Spiegel, Seymour Lipschutz, John J. Schiller, and Dennis Spellman, McGraw-Hill, 2009, ISBN 9780071615693. We may occasionally cover enrichment activities not in the text.

Course Description: This course covers the elements of one-dimensional complex analysis: the complex numbers (their algebra, geometry, and topology); complex functions of one complex variable (definition, examples, limit, continuity) complex analytic functions (definition, examples, properties); integration in the complex plane, particularly Cauchy's integral formula and its applications; infinite series of complex numbers and of complex variables, including Taylor series and Laurent series; the residue theorem and the computation of real integrals by complex methods; and conformal mapping. *Prerequisite*: *MATH 314 Min Grade C.*

Student Learning Outcomes
By the end of the course, students should be able to ***analyze*** functions of a complex variable using series expansions, using line integrals, using geometry, and using partial differential equations; to ***explain*** the major theorems that distinguish complex analysis from real analysis; and to ***apply*** complex analysis to compute geometric mappings and real integrals.

Methods of Instruction: Lecturing, demonstration and models, and some group work, based on time available.

COURSE REQUIREMENTS

Course Evaluation Methods

This course will utilize the following instruments to determine student grades and proficiency of the learning outcomes for the course.

Exams – (in class) There will be two Mid-term exams. You will have a full class period to complete each.
Exam 1: Thursday *February 22nd*
Exam 2: Thursday *April 12th*
Make-up exams are possible only if there is a documented emergency.

Final Exam - (in class) Comprehensive Final Exam.
Final Exam: Tuesday, *May 8th* from 1:15pm to 3:15pm.

Attendance: Class attendance will be taken. There is a strong correlation between attendance and final grades. Class attendance and participation is expected because the class is designed as a shared learning experience and because essential information not in the textbook will be discussed in class. Attendance and participation in all class meetings is essential to the integration of course material and your ability to demonstrate proficiency. Students are responsible to notify the instructor if they are missing class and for what reason. Students are also responsible to make up any work covered in class. It is recommended that each student coordinate with a student colleague to obtain a copy of the class notes, if they are absent.

Homework: There will be weekly homework assignments. The questions for the assignments and each assignment's due date will be posted at the course home page under eCollege. Late homework won't be accepted. Moreover, a student attending two Math Club Meetings will receive a full score for one weekly homework. Math Club meetings will be announced in class or by email couple of days in advance.

Extra Credit: The Mathematics Department offers colloquia and math club activities. You will receive 2 points of extra credit for each colloquium and a math club activity you attend up to 16 points. You need to watch flyers posted in the hallways. There is no make-up for extra credit.

The key to success in this course is regularly working with other students in the class, doing the homework early and asking questions when you have them!!! We may discuss homework problems in class, but there will often not be enough time to discuss all of them. Please come to office hours if you have additional questions about the homework. My office is at Binnion room #323.

Workload and Assistance: You should expect to spend 8 to 10 hours each week, outside of class, on the course material. This includes reading, homework, and studying for quizzes and exams. Some weeks (those in which an exam is scheduled, for instance) may require more of your time, other weeks may require less, but on average, budget 8 to 10 hours each week. In order to be successful in this class you should spend much of this time working with other

students in the class! Please ask questions and seek assistance as needed. You may email me at any time, and I strongly encourage you to make use of my office hours.

GRADING

Grading Matrix: This class will be graded on a total points system. 400 points are possible in the class. The following grading matrix presents how your total score is going to be calculated at the end of the semester of Spring 2018 for Math 438.001 course. All the grading instruments are assigned between the first day of class and last day of class of Spring 2018 semester. The Final exam is the last grading instrument of the course; the date of the Final Exam is: Tuesday, *May 7th* from 1:15pm to 3:15pm. The grade is completely objective and is determined solely by student performance on each of the evaluation criteria (Mid-term exams, in-class quizzes, on-line HW assignments, and the final exam). *Do not expect Extra Credit assignments!*

Instrument	Value (points)	Total
HW Assignments	The best 10 homework assignments will be considered.	100pts
Mid-term Exams	2 Mid-term exams at 100 points each	200pts
Final Exam	One comprehensive final exam at 100 points	100pts
Total:		400pts

Grade Determination:
A = 400 – 360 pts; i.e. 90% or better
B = 320 – 359 pts; i.e. 80 – 89 %
C = 280 – 319 pts; i.e. 70 – 79 %
D = 240 – 279 pts; i.e. 60 – 69 %
F = 239 pts or below; i.e. less than 60%

TECHNOLOGY REQUIREMENTS

A computer algebra system (such as *Mathematica*) will be used for some problem exploration, enhanced conceptual understanding, and to engage students as active participants in the learning process.

COMMUNICATION AND SUPPORT

Interaction with Instructor Statement

An eCollege website has been created for the course which may be accessed from student myLEO accounts following the eCollege and then the My Courses tabs. All files and documents that the instructor shares with the class will be posted in the Document Sharing folder in the course website. eCollege is the Learning Management System used by Texas A&M University-Commerce. You will need your CWID and password to log in to the course. If you do not know your CWID or have forgotten your password, contact Technology Services at 903.468.6000.

My primary form of communication with the class will be through the official university Email and Announcements. Any changes to the syllabus or other important information critical to the class will be disseminated to students in this way via your eCollege Email address available to me through MyLeo and in Announcements. It will be your responsibility to check your official university Email and Announcements regularly.

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures

Academic Honesty
Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including (but not limited to) receiving a failing grade on the assignment, the possibility of failure in the course and dismissal from the University. Since dishonesty harms the individual, all students, and the integrity of the University, policies on scholastic dishonesty will be strictly enforced. In ALL instances, incidents of academic dishonesty will be reported to the Department Head. Please be aware that academic dishonesty includes (but is not limited to) cheating, plagiarism, and collusion.

Cheating is defined as:
- Copying another's test of assignment
- Communication with another during an exam or assignment (i.e. written, oral or otherwise)
- Giving or seeking aid from another when not permitted by the instructor
- Possessing or using unauthorized materials during the test
- Buying, using, stealing, transporting, or soliciting a test, draft of a test, or answer key

Plagiarism is defined as:
- Using someone else's work in your assignment without appropriate acknowledgement
- Making slight variations in the language and then failing to give credit to the source

Collusion is defined as:
- Collaborating with another, without authorization, when preparing an assignment
If you have any questions regarding academic dishonesty, ask. Otherwise, I will assume that you have full knowledge of the academic dishonesty policy and agree to the conditions as set forth in this syllabus.

Late/Make-up Policy: Make-up exams are possible only if there is a documented emergency. There will be no make-ups for any missed in-class quizzes. Instead, at the end of the semester only the highest ten in-class quizzes will be considered. Late work on online homework will not be accepted without a

documentable and valid excuse. Examples of documentable and valid excuses include:

*car accident w/ police report

*illness w/ doctor's note (you or your child)

*athletic or other mandatory extra-curricular travel

*field trip for another class

*being detained upon entering the country by Homeland Security

University Specific Procedures

ADA Statement

Students with Disabilities

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services

Texas A&M University-Commerce

Gee Library- Room 162

Phone (903) 886-5150 or (903) 886-5835

Fax (903) 468-8148

Rebecca.Tuerk@tamuc.edu

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. (See *Student's Guide Handbook, Policies and Procedures, Conduct.*) This means that rude and/or disruptive behavior will not be tolerated.

Texas A&M University – Commerce is committed to a safe, accepting environment for all students regardless of sexual orientation, gender identification, or gender expression: A&M-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Copyright Policy:

The handouts used in this course are copyrighted. By "handouts," I mean all materials generated for this course, which include but are not limited to syllabi, lecture notes, quizzes, exams, in-class materials, review sheets, projects, and problems sets. Because these materials are copyrighted, you do not have the right to copy and distribute the handouts.

Campus Concealed Carry

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce

buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations. For a list of locations, please refer to (http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf) and/or consult your event organizer). Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

COURSE OUTLINE / CALENDAR

WEEKLY SCHEDULE:

This schedule is subject to change by the instructor. Any changes to this schedule will be communicated by email and in-class announcements.

(Week 1&2) CH1: *Complex Numbers*
(Week 2&3) CH2: *Differentiation*
(Week 4&5) CH3: *Examples of Complex Functions*
(Week 6) *Exam #1 (Thursday Feb. 22nd)*
(Week 7, 8) CH4: *Integration* of Complex Functions, *Cauchy's Theorem* & CH5: *Consequences of Cauchy's Theorem*
Spring Break (March 12, 13, 14, 15, & 16)
(Week 9) Continuing on CH4: *Integration* of Complex Functions, *Cauchy's Theorem*
(Week 10) CH6: *Harmonic Functions*
(Week 11)* CH7: Complex *Power Series*

(Week 12) *Exam #2 (Thursday April 12th)*
(Week 13) CH8: *Taylor and Laurent Series*
(Week 14) CH9: *Isolated Singularities and Residue Theorem*
(Week 15). To Be Arranged
(Week 16). *FINAL EXAM (Tuesday, May 8th from 1:15pm to 3:15pm)*

Note: *Because of the MAA-TX meeting at El Centro College starts on April 5th, the lecture on Thursday, April 5th will be held on Friday March 30th (exact time to be arranged and announced during the semester).