Spring 2026:   Math 5321-1 Complex Variable II

Instructor: Dr. Alexander Solynin	**Place:** MATH 109
Office Hours: TR 9:00-10:30 W 10:00-12:00 or by appointment	**Text:** *Class Notes; Functions of One Complex Variable,* 2nd Edition by John Conway; *Complex Analysis* by Theodore W. Gamelin
Office: MA 231	**Time:** 11:00-12:20 TR
Email: alex.solynin@ttu.edu	**Prerequisite:** Complex Variable I

- **Course Prerequisite:** Complex Variable I. Some familiarity with real analysis of one variable and multivariable calculus is required but the fundamental necessary ideas will be reviewed. Basic knowledge of high school algebra and trigonometry will be useful.

Learning Outcomes: Upon completion Complex Variable I and Complex Variable II students will master concepts and theories of calculus of one complex variable, geometry and topology of the complex plane. Specifically, in Complex Variable II class students will learn the following subjects:

- The argument principle,
- The maximum modulus theorem,
- Schwarz lemma,
- Schwarz reflection principle,
- Compactness and convergence in the space of analytic functions,
- The Riemann mapping theorem,
- Runge's theorem,
- Basic properties of harmonic functions.

Assessment of the learning outcomes will be achieved through one or more activities such as class discussion, board work, selected non-graded homework, and other optional activities deemed appropriate by the instructor. It is important to note that these assessments are for learning benefit.

STUDENT EVALUATION:

● **Final Exam (Optional!)** The final exam is comprehensive. Your score on the Final Exam can be used to substitute for any in-class exam of your choice.

♦ **Thursday, May 7   FINAL EXAMINATION 1:30 – 4:00 pm   100 pts**
   This exam is scheduled before the semester begins. Students should **eliminate any conflicts NOW.**

• **EXAM 1:** (February 26)   **100 pts (31%)**
• **EXAM 2:** (April 16)   **100 pts (31%)**
• **QUIZZES**: There will be 8 quizzes.
          (01.22,02.03,02.12,02.24,03.10,03.26,04.07,04.28)
          15 min at the end of the class. 15pts each.   **Total= 120 pts (38%)**
 • **HOMEWORK ASSINGNMENTS:** To help students prepare for exams and quizzes, I'll be providing regular homework assignments. These will not be collected or graded but completing them is the most effective way to ensure students are ready for exams and quizzes.
• **MAXIMAL TOTAL:**   **320 pts (100%)**

GRADING PROCEDURE:

A   -   **90 - 100%**

B   -   **80 - 89%**

C   -   **70 -79%**

D   -   **60 - 69%**

F   -   **≤ 59%**

Students with Disabilities: Any student who, because of a disability may require special arrangements in order to meet course requirements should contact the instructor as soon as possible to make any necessary accommodation. Students should present appropriate verification from Access TECH. No requirement exists that accommodation be made prior to completion of this approved university procedure.

Absence due to religious observance: The Texas Tech University Catalog states that a student who is absent from classes for the observance of a religious holy day will be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence. Notification must be made in writing and delivered in person no later than 15th class day of the semester.

Absence due to officially approved trips: The Texas Tech University Catalog states that the person responsible for a student missing class due to a trip should notify the instructor of the departure and return schedule in advance of the trip. The student may not be penalized and is responsible for the material missing.

Academic Integrity: It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and a high standard of integrity. There will be no tolerance for cheating or plagiarism. Texas Tech University policies will be enforced in such cases.

Important Dates:
January 14   - Classes Begin.
March 14-22   - Spring Vacation.
April 6   - No Classes.
May 5   - Last Day of classes.
Tuesday, May 7 - 1:30 – 4:00 pm.   Final Exam (Examinations will be given in the rooms in which the individual classes have been meeting unless otherwise announced**).**
May 18, 5:00pm   - Final Grades Due via Web.

Course Calendar

Date   Tentative Lecture Topics

Jan. 15-Feb. 24   The argument principle. Rouche's Theorem.
                               Schwarz lemma.
                               Schwarz reflection principle.
                               Spaces of analytic functions. Convergence.
February 26   **Exam 1**.
March 3-April 14   Spaces of analytic functions. Convergence.
                               Riemann mapping theorem.
                               Weierstrass factorization theorem.
                               Special functions.
                               Runge's theorem.
April 16   **Exam 2**.
April 21-April 30   Mittag-Leffler's theorem.
                               Harmonic functions.

May 5   Review of the Course. Last class.

May 7   **FINAL EXAMINATION 1:30 –4:00 pm**