Instructor: Dr. María Cristina Villalobos
Contact Info: EMAGC 3.718 / 956.665.2123 / 665.3452
   cristina.villalobos@utrgv.edu
Office Hours: Tuesday/Thursday: 10:45am-11:45am and 3:00-3:30pm
   Wednesday: 9am-10am or by appointment

COURSE INFORMATION
Class Meetings: TR 1:40pm – 2:55 pm in EMAGC 1.320
Prerequisites: MATH 2318 Linear Algebra with grade of “C” or better
   https://sites.google.com/site/mathematicalreasoning3ed/

Content: Topics include writing proofs in mathematics, logical reasoning, mathematical induction, set theory, and other topics as time allots.

STUDENT LEARNING OUTCOMES (SLOs) After completing this course, students will be able to
1. Understand the logical structure of mathematical proofs and associated constructs, such as logical statements, conditional statements, and quantified statements.
2. Master the basic techniques and strategies used in mathematical proofs, such as direct proof of conditional and quantified statements, proof by contrapositive, proof by contradiction, proof by exhaustion, uniqueness proofs, and mathematical induction.
3. Master the basic techniques used to disprove false conjectures.
4. Write mathematical arguments, such as proofs, in clear, precise, and correct English.
5. Master rudimentary mathematical typesetting.
6. Understand and use correctly mathematical structures and tools such as sets, relations, orders, functions, and cardinality, as well as often used formulas and inequalities.
7. Develop an expanding vocabulary of mathematical terminology and the ability to use it fluently and correctly.
8. Become acquainted with famous mathematical ideas, theorems, arguments, proofs, and formulas that every mathematician should know.

ATTENDANCE
Attendance is mandatory and is taken daily; arriving 15 minutes late is considered an absence. If four or more absences have accumulated, the instructor has the right to drop the student from class in accordance with policies set by the UTRGV. It is strongly advised to attend each class. Students are responsible for all material presented in class and in the textbook sections, watching screencasts, preparing textbook problems, studying supplementary material, and for any changes made to the syllabus.

ASSESSMENTS AND GRADE DISTRIBUTION
Discussion Worksheets (15%): Discussion Worksheets will be issued on a regular basis during class time and submitted before the end of class; no make-up discussion worksheets will be allowed with regard to absences. Students will work in groups and one discussion worksheet will be
submitted for the group whose grade will be applied to the entire group. On various occasions, individual grades will be assigned for members of the group.

**Guided Practice/Quizzes (5%)**: Guided Practice assignments will be issued on a regular basis and will consist of watching screencasts and completing hand-written assignments. Quizzes will also be administered when appropriate in class. You are allowed to work in groups to complete the Guided Practice, but the assignment must be written solely by you. Guided practice assignments will be submitted as soon as the class begins. No late assignments or make-up quizzes will be accepted. Any type of academic dishonesty will be handled by the instructor or by the appropriate administration.

**Homework (10%)**: Homework will be assigned and graded with some portions being graded.

**Exams (45%)**: 3 exams will be administered where each exam is worth 15%

**Comprehensive Final Exam (25%)**: Tuesday, December 11, 1:15pm – 3:00pm

**Make-Ups**: No make-up exams will be administered unless the absence is excused by a University-sanctioned event, the observance of a religious holiday, or by an exceptional and unavoidable circumstance. It is your responsibility to inform me of any excused absences BEFORE THE EXAM and to schedule a make-up exam. A make-up exam will be administered within 48 hours of the missed exam. A grade of zero will be given for any missed homework or exams.

**Advice**: Occasional short lectures will be given to introduce topics, combine ideas, or facilitate a class discussion. In general, however, the ability to write proofs cannot simply be “transferred” from one person to another by lecture, but rather takes practice, hard work, and lots of independent thinking. Expect to spend 6-10 hours each week completing all assigned reading and work.

**Drop Policy**
According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of the “3-peat rule” and the “6-drop” rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.

**GRADE SCALE**
- A [90, 100]
- B [80, 90]
- C [70, 80]
- D [60, 70]
- F Below 60

**COMMENTS ABOUT STUDYING**
For every hour you spend in class, you should spend at least two hours outside of class. Thus, for this 3-credit hour class, you should spend at least 6 hours outside of class/week, which should consist of reviewing lecture notes, reading through the text, completing homework, working on text problems, and working on any other relevant material. Research has shown that students retain more information if lecture notes are studied prior to the next class period. In addition, research shows that students academically perform better when studying in groups.
Writing good proofs in mathematics takes much practice. Therefore, practice is the key!!

Watch the screencasts. Work on homework assignments and complete all assignments. Also, work on textbook problems not assigned in class to obtain a better understanding of the concepts. Work in groups to achieve a better understanding of the material. Learn the concepts and ideas. Ask questions. See the instructor or your peers for additional help as soon as you encounter difficulties understanding the material. It is difficult to learn material if you put off learning until “the day before the exam”. Seek the Math Lab in MAGC, your notes, mathematics books, other tutoring services, or your peers for help.

NOTE: The syllabus is subject to change.

Electronic Communication Policy: The university policy requires all electronic communication between the University and students be conducted through the official University supplied systems. Therefore, please use your UTRGV assigned email account for all future correspondence with UTRGV faculty and staff.

Mandatory Course Evaluation Period: Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (http://my.utrgv.edu); you will be contacted through email with further instructions. Students who complete their evaluations will have priority access to their grades. Online evaluations will be available:

- Module 1: October 4 - 10
- Module 2: November 29 - December 5
- Full Semester: November 15 - December 5

Students with Disabilities: Students with a documented disability (physical, psychological, learning, or other disability which affects academic performance) who would like to receive academic accommodations should contact Student Accessibility Services (SAS) as soon as possible to schedule an appointment to initiate services. Accommodations can be arranged through SAS at any time, but are not retroactive. Students who suffer a broken bone, severe injury or undergo surgery during the semester are eligible for temporary services.

Pregnancy, Pregnancy-related, and Parenting Accommodations
Title IX of the Education Amendments of 1972 prohibits sex discrimination, which includes discrimination based on pregnancy, marital status, or parental status. Students seeking accommodations related to pregnancy, pregnancy-related condition, or parenting (reasonably immediate postpartum period) are encouraged to contact Student Accessibility Services for additional information and to request accommodations.

Brownsville Campus: Student Accessibility Services is located in Cortez Hall Room 129 and can be contacted by phone at (956) 882-7374 (Voice) or via email at ability@utrgv.edu. Edinburg Campus: Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at ability@utrgv.edu.

Sexual Harassment, Discrimination, and Violence: In accordance with UT System regulations, your instructor is a “Responsible Employee” for reporting purposes under Title IX regulations and so must report any instance, occurring during a student’s time in college, of sexual assault, stalking,
dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect that is free from sexual misconduct and discrimination.

**Student Learning Outcomes for the Mathematics Major:** This course is required of students seeking a B.S. in Mathematics. Students completing the B.S. program in Mathematics will

P1. Demonstrate in-depth knowledge of mathematics, its scope, application, history, problems, methods, and usefulness to mankind both as a science and as an intellectual discipline.

P2. Demonstrate a sound conceptual understanding of mathematics through the construction of mathematically rigorous and logically correct proofs.

P3. Identify, formulate, and analyze real world problems with statistical or mathematical techniques.

P4. Utilize technology as an effective tool in investigating, understanding, and applying mathematics.

P5. Communicate mathematics effectively to mathematical and non-mathematical audiences in oral, written, and multi-media form.