Math 323-001, Formal Mathematical Reasoning and Writing
LIVE ONLINE, MTWRF 11:00AM – 12:15PM

Instructor: Anton Izosimov
Email: izosimov@math.arizona.edu
Office Hours: TBA. The zoom link will be posted in the D2L calendar.

Class Meetings: The class will meet MTWRF, 11 am – 12:15 pm, via Zoom. The zoom link can be found in the D2L calendar. It is highly recommended that you access our class Zoom meetings from D2L.

D2L: https://d2l.arizona.edu/d2l/home/1034707. This is the main source of information regarding the class: deadlines, announcements, etc.

Class Recordings: We will record all our classes. The list of participants will not be recorded.
TO ACCESS RECORDINGS, GO TO OUR CLASS D2L → UA TOOLS → ZOOM → CLOUD RECORDINGS.

Textbook: Daniel Madden and Jason Aubrey, An Introduction to Proof Through Real Analysis.
https://onlinelibrary-wiley-com.ezproxy1.library.arizona.edu/doi/book/10.1002/9781119314769

Gradescope: https://www.gradescope.com/courses/269313. This is where you will submit homework and exams.

Grading: The total grade for this class consists of a participation grade (5%), homework grade (20%), midterms grade (40%), and final exam grade (35%). A score of 90% or higher is an A, at least 80% but less than 90% is a B, etc. The thresholds may be curved down.

Participation Grade: During class, students will be given assignments to work on in groups. Participation grade will be computed as the number of assignments completed by the student divided by the total number of assignments. A student who misses a class for a valid reason is deemed exempt from this class and is not responsible for the assignment given during that class.

Homework: Homework will be assigned on a regular basis, typically once a week. Late homework will generally not be accepted. All homework assignments will have the same weight in the final grade.

Midterms: There will be two midterms, tentatively on June 2 and June 17. The exams will either be held during the class time, or students will be a given a chance to choose their starting time out of a larger time slot. Both midterms will have the same weight in the final grade.

Final Exam: The final is tentatively scheduled for the last day of classes, July 2.

Class Attendance:

- If you feel sick, or may have been in contact with someone who is infectious, stay home. Except for seeking medical care, avoid contact with others and do not travel.
- Notify your instructors if you will be missing an in person or online course, or you will miss an assignment deadline.
- Non-attendance for any reason does not guarantee an automatic extension of due date or

rescheduling of examinations. Please communicate and coordinate any request directly with your instructor.
- Campus Health is testing for COVID-19. Please call (520) 621-9202 before you visit in person.
- Visit the UArizona COVID-19 page for regular updates.

Academic Advising: If you have questions about your academic progress this semester, or your chosen degree program, please note that advisors at the Advising Resource Center can guide you toward university resources to help you succeed.

Life Challenges: If you are experiencing unexpected barriers to your success in your courses, please note the Dean of Students Office is a central support resource for all students and may be helpful. The Dean of Students Office can be reached at 520-621-2057 or DOS-deanofstudents@email.arizona.edu.

Physical and Mental Health Challenges: If you are facing physical or mental health challenges this semester, please note that Campus Health provides quality medical and mental health care. For medical appointments, call (520) 621-9202. For After Hours care, call (520) 570-7898. For the Counseling & Psych Services (CAPS) 24/7 hotline, call (520) 621-3334.

Equipment and Software Requirements: For this class you will need daily access to the following hardware: a laptop or web-enabled device with a microphone and, preferably, a webcam; a scanner or a camera-equipped phone. You will also need regular access to reliable internet signal.

Usage of Class Recordings: For lecture recordings, which are used at the discretion of the instructor, students must access content in D2L only. Students may not modify content or re-use content for any purpose other than personal educational reasons. All recordings are subject to government and university regulations. Therefore, students accessing unauthorized recordings or using them in a manner inconsistent with UArizona values and educational policies are subject to suspension or civil action.

Classroom Behavior Policy: To foster a positive learning environment, students and instructors have a shared responsibility. We want a safe, welcoming, and inclusive environment where all of us feel comfortable with each other and where we can challenge ourselves to succeed. To that end, our focus is on the tasks at hand and not on extraneous activities (e.g., texting, chatting, reading a newspaper, making phone calls, web surfing, etc.).

University-wide Policies: Links to the following UA policies are provided here, https://academicaffairs.arizona.edu/syllabus-policies:
- Absence and Class Participation Policies
- Threatening Behavior Policy
- Accessibility and Accommodations Policy
- Code of Academic Integrity
- Nondiscrimination and Anti-Harassment Policy
- Subject to Change Statement

Incomplete (I) or Withdrawal (W): Requests for incomplete (I) or withdrawal (W) must be made in accordance with University policies, which are available at http://catalog.arizona.edu/policy/grades-and-gradingsystem#incomplete and http://catalog.arizona.edu/policy/grades-and-grading-system#Withdrawal respectively.

Course Objectives: The emphasis of this course is on the principles underlying mathematical reasoning and proofs.

Expected Learning Outcomes: A student should know or be able to do the followings upon completing the course, based on knowledge/skills gained. 1. Define mathematical terms precisely. 2. Construct proofs that follow directly from a definition. 3. Recognize when arguments are valid, and identifies logical gaps and flaws (false statements). 4. Produce valid proofs using the techniques of mathematical induction, contradiction, contrapositive, and construction.

Scheduled Topics/Activities: The following material will be covered throughout the semester:

1. Logic and Proof (Part II, Chapters 7 and 8) – elementary logic, quantifiers, techniques of proofs
2. Sets and Functions (Part II, Chapter 9 - 12) – manipulations with sets, relations and functions
3. The Real Numbers (Part I, Chapters 1 - 6 and Part III, Chapters 14 - 15) – natural numbers, integers, rational numbers, reals and ordered fields