MAT 312 — Mathematical Reasoning — Fall 2011

Course Description: Course designed to improve the students' understanding of the nature and methods of mathematical proof by means of practice and participation. The content will include mathematical logic, set theory, relations and functions, cardinality, axiomatic structures, techniques of proof, and extensive practice in proof and problem solving. Credit cannot be received for both MAT 312 and 399. The department recommends a student take this course in his/her sophomore year in the program. (3 credit hours)

Prerequisites: MAT 308.   **Instructional Activities:** Lectures and problem solving.

Field, Clinical, Laboratory Experiences, Resources: None.

Purpose & Course Objectives: This course is an introduction to constructing and writing mathematical proofs. The objective is for the student to become familiar with concepts of logic and proficient in writing simple proofs.

Instructor: Dubravko Ivanšić [pronunciation: DOO-brahv-ko EE-vahn-shich] Ivanšić is the last name.

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Course webpage: (A link to this has also been placed on Blackboard.)
http://campus.murraystate.edu/academic/faculty/divansic/11fall/312home.html

Office Hours: Ask me or check the webpage.

Textbook & Content Outline: T. Sundstrom, "Mathematical Reasoning". We plan to cover chapters 1–7 or their parts.

Homework: To promote a continuous effort in the course, homework problems will be assigned. Typically, a section will be assigned once we have covered it and selected problems will be discussed in class. The list of homework problems may be found on the webpage. A smaller portion of the homework problems is to be written up and handed in. In order to succeed in the course you will need to work on all the problems, since test problems will be based on *all* problems assigned for homework and those done in class, not just the ones you hand in.

The problems that you hand in should be reasonably neat and all the sheets should be stapled together. The proofs you write need to be logically correct and written in accordance to guidelines that we will learn. Points will be taken off if these guidelines are not followed or if the homework is late.

Don't fall behind: Many people have trouble with this course because they have no experience writing proofs. This task is not in itself difficult (in the examples that we do in this course), but requires a lot of practice. Unlike following simple procedures, which is what one has mostly done in math courses so far, writing proofs is more of an acquired skill based on experience. Thus, the key is to keep trying and to learn from mistakes. Finally, if you are having difficulty, come to me for help as soon as possible, and not the day before the exam...

Attendance: is strongly encouraged every day, and roll will be taken. If you missed six or fewer classes during the semester, you get 3% bonus points. Note that you are not penalized for missing a class (the points are in excess of your total grade), so an absence is counted as such regardless of the reason ("excused" or not).

Participation in class: is strongly encouraged, as your questions indicate what points need to be addressed in more detail. We will go over some homework in class. You are expected to have worked the problems at home in order to both ask and answer questions on the homework. To encourage participation, a portion of your final course grade will be based on how active you are in class. In order to earn points, you need to be able to answer a homework question when called on.

Exams: There will be three exams whose dates will be announced well in advance. **On all exams calculators will not be allowed.**

Final exam: is comprehensive and will be held on Tuesday, December 6th at 10:30AM in our usual classroom.

Grading procedure: For your final grade, each of the three exams is worth 20%, homework is worth 35% and participation in class is worth 5% of the total. Your final exam grade replaces your poorest exam grade if it is better. If you are happy with your exam scores during the semester, you don't have to take it. (Note that getting a good grade on the final is more difficult than on a regular exam, since it covers the whole semester.) No extra credit work will be given to repair your grade. The final grade scale is approximately

$$90\%\text{–}100\%\text{=}A,\ 80\%\text{–}89\%\text{=}B,\ 70\%\text{–}79\%\text{=}C,\ 60\%\text{–}69\%\text{=}D,\ 0\%\text{–}59\%\text{=}E.$$

Make-ups: Make-ups for exams will be given only in cases of illness, field trips or other unavoidable circumstances. You will need to provide written verification of the reason for your absence in advance and as soon as possible. If you are unexpectedly absent from an exam, contact me by phone or e-mail **that same day** and arrange to take a make-up. The make-up should occur *soon*, which typically means "before I return the exam". Make-ups for other graded work will be given at my discretion. Asking for a make-up more than once makes it less likely that I will grant it.

Academic honesty policy: In compliance with the Board of Regents policy on academic integrity, instances of academic dishonesty, as determined by the instructor, will result in zero points for the assignment and possibly a grade of "E" for the course.

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