

Logic and Foundations of Mathematics for Teachers

Instructor: Dr. Ianna West

NICHOLLS  
STATE UNIVERSITY



**Office:** Peltier 106-B

**Office Hours:** 1T, 2T, 5T, 6T and **Online** MWF 10:00-11:00AM. Available for consultation via email or in the Blackboard virtual classroom during online office hours, or by appointment.

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**Section:** WWW

**Required Text and Other Materials:** No required text; access to a computer with internet is required.

**Suggested reference texts:** *Conjecture & Proof An Introduction to Mathematical Thinking* by Diane Driscoll Schwartz; *Mathematical Reasoning Writing and Proof 2<sup>nd</sup> Edition* by Ted Sundstrom; *Proof, Logic, and Conjecture* by Robert S. Wolf; *A Transition to Advanced Mathematics* by Douglas Smith, Maurice Eggen, and Richard St. Andre, and *Foundations of Higher Mathematics* by Peter Fletcher and C. Wayne Patty.

**Prerequisites:** MATH 265 (Calculus III) and MATH 358 (Foundations of Mathematics).

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**Catalog Description:** Cornerstone course normally taken in first semester of graduate study. Developing and evaluating arguments and proofs, the use of various types of reasoning, methods of proof, making and investigating conjectures.

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**Student Outcome Objectives:**

Student will be able to:

1. Understand and apply standard mathematical language;
2. Formulate definitions of given mathematical terms;
3. Understand the definition of conjecture and apply this knowledge to form conjectures;
4. Discuss the plausibility of a conjecture without a formal proof;
5. Develop assertions as theorems;
6. Understand the terminology and rules of logic;
7. Apply the rules of logic to construct formal proofs of conjectures and/or theorems;
8. Understand the use of counterexamples and use counterexamples to disprove false conjectures;
9. Demonstrate knowledge of and how to apply assumptions, axioms previously proved theorems and definitions in deductive proofs.
10. Understand and apply various methods of proof including direct proof, proof by contrapositive, proof by contradiction, and mathematical induction.

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## Course Content and Requirements

**Hardware and Software Requirements:** The course will be conducted via internet using Blackboard and email. The URL for the university's distance learning website is <http://www.nicholls.edu/distance/> . FAQs about internet courses can be viewed at <http://www.nicholls.edu/distance/faqs/> . A download for minimum computer requirements for taking a course on Blackboard can be found in the last question on the FAQs site given above. A Blackboard Tutorial can be viewed at <http://www.nicholls.edu/distance/blackboard-tutorial/>.

**On Campus Meeting Requirements:** None

**Notes:** Lecture notes will be available on Blackboard.

**Homework:** Exercises will be assigned from each section. Students are strongly encouraged to complete all homework assigned to ensure an understanding of the concepts. Only two or three problems from those exercises will be assigned for a grade. Each problem set will be worth ten points.

**Exams:** There will be a midterm exam worth 200 points and a final exam worth 200 points. Dates of exams will be announced. If a student is out-of-state or lives further than two hours from Nicholls State University, he or she may request an alternative location to take the exams. Arrangements need to be made in advance; so inform the instructor at the beginning of the semester if you will be taking the exams off-campus.

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**Methods of Evaluation:** Grade will be calculated on a ten point grading scale 90-100 A, 80-89 B, 70-79 C, 60-69 D, below 60 F. Grade will be determined as follows:

<b>Homework</b>	10 problem sets @10 points	100 points
<b>Midterm Exam</b>		200 points
<b>Final Exam</b>		200 points
Total points		500 points

**\*\*Distribution of points may change during the semester\*\***

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**Make-up Procedure:** To make up a test, student must have a valid written excuse resulting from an emergency situation since we are only having a midterm and a final exam. Students representing the university in any official capacity will be granted valid excuses and will be allowed to make up an exam.

**Behavioral Policy:** Students must **at no time** be disrespectful toward the instructor. Students must behave in a professional manner at all times. Failure to act in an appropriate manner will not be tolerated.

**Attendance Policy:** Participation in activities is required where an electronic record which clearly indicates time and date activity was submitted. For financial aid purposes, student must complete at least one activity , which is equivalent to having attended a class at least once.

**Academic Honesty Policy:** Cheating will not be tolerated. Sanctions for academic cheating, plagiarism, and forgery of academic documents including signing another's name (Sec 1.9) are those outlined in the *Code of Student Conduct* handbook.

**Academic Grievances:**

The proper procedure for filing grade appeals or grievances related to academic matters is listed in Section 5 of the Code of Student Conduct and at the following link:

[http://www.nicholls.edu/documents/student\\_life/code\\_of\\_conduct.pdf](http://www.nicholls.edu/documents/student_life/code_of_conduct.pdf).

**Continued Learning Following an Extreme Emergency:**

In order to make continued learning possible following an extreme emergency;

***Students are responsible for:***

- reading regular emergency notifications on the NSU website;
- knowing how to use and access Blackboard (or university designated electronic delivery system);
- being familiar with emergency guidelines;
- evacuating textbooks and other course materials;
- knowing their Blackboard (or designated system) student login and password;
- contacting faculty regarding their intentions for completing the course.

***Faculty are responsible for:***

- their development in the use of the Blackboard (or designated) software;
- having a plan for continuing their courses using only Blackboard and email;
- continuing their course in whatever way suits the completion of the course best, and being creative in the continuation of these courses;
- making adjustments or compensations to a student's progress in special programs with labs, clinical sequences or the like, only in the immediate semester following the emergency.

**Americans with Disabilities Act:** If you have a documented disability that requires assistance, you will need to register with the Office of Disability Services for coordination of our academic accommodations. The Office of Disability Services is located in Peltier Hall, Room 100-A. The phone number is (985) 448-4430 (TDD 449-7002).

**The last day to drop this course with a "W" is Friday, April 4, 2008.**