

**Fayetteville State University**  
**College of Arts and Sciences**  
**Department of Mathematics and Computer Science**  
**MATH 260-01: Foundations of Mathematics**  
**Fall 2010**

**I. Locator Information:**

Course Name: MATH 260-01: Foundations of Mathematics  
Semester Credit Hours: 3  
Day and Time Class Meets: TR, 1:00pm-2:15am, LSA 120

**Contact Information**

Instructor: Dr. Ali Ikiz  
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**Office Hours**

Monday: 9:30 – 11:30  
Tuesday: 11:00 – 1:00  
Wednesday: 9:30 – 11:30  
Thursday: 11:00 – 1:00  
Friday:

**“In case FSU must close for an emergency during the semester, instruction will continue using Blackboard.”**

**FSU Policy on Electronic Mail:** Fayetteville State University provides to each student, free of charge, an electronic mail account ([username@uncfsu.edu](mailto:username@uncfsu.edu)) that is easily accessible via the Internet. The university has established FSU email as the primary mode of correspondence between university officials and enrolled students. Inquiries and requests from students pertaining to academic records, grades, bills, financial aid, and other matters of a confidential nature must be submitted via FSU email. Inquiries or requests from personal email accounts are not assured a response. The university maintains open-use computer laboratories throughout the campus that can be used to access electronic mail. Rules and regulations governing the use of FSU email may be found at <http://www.uncfsu.edu/PDFs/EmailPolicyFinal.pdf>

**II. Course Description:** A course providing transition to students for upper level courses in mathematics. Topics include set theory, logic, proof techniques, induction, equivalence relations, functions and cardinality, countable and uncountable sets, sequences. **Prerequisite:** MATH 142 and MATH 150

**III. Disabled Student Services:** In accordance with Section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act (ACA) of 1990, if you have a disability or think you have a disability to please contact the Center for Personal Development in the Spaulding Building, Room 155 (1<sup>st</sup> Floor); 910-672-1203.

**IV. Textbook:** Richmond, Bettina and Thomas Richmond. *A Discrete Transition to Advanced Mathematics*. Belmont, CA: Brooks/Cole Publishing Co., 2004.

**V. Student Learning Outcomes** – Upon completion of this course, students will be able to: Students will have a fairly good background for advanced courses in mathematics, such as advanced algebra, topology, real analysis, etc. DPI

- 8.1 Know the symbolism of mathematical logic
- 8.2 Demonstrate a thorough knowledge of the concepts of equivalence and implication
- 8.3 Negate a logical statement which employs quantifiers
- 8.4 Posses a knowledge of the properties of consistency and independence of axiomatic system
- 8.5 Posses a thorough knowledge of the role of proof in the study and development of mathematics
- 8.6 Create proofs in the various branches of mathematics
- 8.7 Understand recursive definitions of sequences and functions, and use recursion and technology to model and study real world properties
- 9.1 Use the set theoretic operations
- 9.2 Know the relationship between the logical operations and the set theoretic operations
- 9.3 Demonstrate a knowledge of the concept of a set theoretic relation
- 9.4 Demonstrate a knowledge of the concept of function, domain, range, etc.
- 9.5 Know elementary concepts of networks and graphs

**NCATE**

- 1.1 Prepare prospective teachers to use problem-solving approach to investigate and understand mathematics.
- 1.2 Prepare prospective teachers to write and use mathematical language and symbols.
- 1.3 Prepare prospective teachers to make and evaluate mathematical conjectures and arguments and validate their own mathematical thinking.
- 1.4 Prepare prospective teachers to understand the interrelationships in mathematics and connect mathematics with other fields.

**VI. Course Requirements and Evaluation Criteria**

a. Grading Scale – Homework will be collected regularly. Four major tests will be given. The lowest test score will be dropped. A comprehensive final exam will be given at the conclusion of the course. The grading scale for determining the course grade is given below.

To see how your grade will be calculated, suppose your test scores are 75, 80, 90, and 90, you have 9 points extra credit from quizzes, your final exam score is 80, and your homework score is 90. Your percentage grade will be calculated as follows:

$$0.5 \times \underbrace{[(80 + 90 + 90) \div 3]}_{\text{Tests}} + \underbrace{0.2 \times 80}_{\text{Final Exam}} + \underbrace{0.25 \times 90}_{\text{Homework}} + \underbrace{0.05 \times 70}_{\text{Attendance}} + \underbrace{9}_{\text{Extra Credit}} = 94.3 \text{ and you will have a grade}$$

A for the course.

$$\text{Grading Scale: } \underbrace{100\% - 90\%}_A, \underbrace{89.9\% - 80\%}_B, \underbrace{79.9\% - 70\%}_C, \underbrace{69.9\% - 60\%}_D, \underbrace{59.9\% - 0\%}_F$$

Attendance:	5%
Homework:	25%
Tests (4):	50 %
Final Exam:	20 %

b. Attendance Requirements – The FSU Attendance Policy stated on pages 58 and 59 of the 2006-2008 University Catalogue will be strictly enforced. **Three (3) late arrivals** and/or **early departures** will count as one absence. Exceeding the limit of **four (4) unexcused absences** will result in an interim grade EA = Excessive Absence. When a student enters the classroom after the roll call, it is the responsibility of the student to inform the instructor after class that (s)he was in attendance. You must notify the instructor when it is necessary for you to leave early.

Notice that: **Students receive no refund for withdrawing from individual classes and they slow their progress toward degree completion. Students who withdraw from or fail more than one-third of their classes will no longer be eligible for financial aid.**

**Students must strive to earn credit for all the classes in which they enroll. Students should withdraw from classes only when it is absolutely necessary.**

c. Graded Assignments --There will be four homework, four tests, and a comprehensive final exam (see the schedule). The weight given to various activities for evaluation is as follows:

Attendance: 5%, Tests: 50%, Final Exam: 20%, and Homework: 25%. There will be some extra credit from unannounced quizzes or in other forms.

d. Policy on **Missed** or **Late Assignments** -Late homework will no longer be accepted after it has been graded and returned to class. If homework is given to me the day after it is due, it will lose 20% of its total value. For two days delay it will lose 40% of its total value and so on. **No make-up tests for unexcused absences! For excused absences student should contact the instructor prior to the test!**

e. Other -Dishonesty on graded assignments will not be tolerated. Students must neither give nor receive help on any work to be graded. The University policy on cheating will be applied to any violations. The minimum penalty will be a grade of zero on the assignment (including tests).

**Please note: If these evaluation criteria must be revised because of extraordinary circumstances, the instructor will distribute a written amendment to the syllabus.**

**Student Behavior Expectations:** The instructor will respect all students and will make every effort to maintain a classroom climate that promotes learning for all students. Students must accept their responsibility for maintaining a positive classroom environment by abiding by the following rules:

1. Students are expected to arrive to class on time, remain in class until dismissed by the instructor, and refrain from preparing to leave class until it is dismissed.
2. Student/teacher relationships, as well as relationships among peers, must be respectful at all times.
3. Students are not permitted to wear headphones or other paraphernalia that may be distracting to the classroom environment.

3. Students must refrain from any activity that will disrupt the class; this includes turning off cell phones and pagers.
4. Students are not permitted to use profanity in the classroom.
5. Students will not pass notes or carry on private conversations while class is being conducted.

**Consequences for Failing to Meet Behavioral Expectations:** The first time a student violates one of these rules, the instructor will warn him or her privately, either after class or before the next class. (Faculty members reserve the right to warn students publicly if needed.) The second time a student violates the guidelines, the instructor may deduct as many as twenty points from the student's next exam grade. If a student violates the guidelines three times, the instructor will report the student to the Dean of Students for disciplinary action according to the FSU Code of Student Conduct.

### **FSU Policy on Disruptive Behavior in the Classroom**

The *Code of the University of North Carolina* (of which FSU is a constituent institution) and the *FSU Code of Student Conduct* affirm that all students have the right to receive instruction without interference from other students who disrupt classes.

FSU Core Curriculum Learning Outcome under Ethics and Civic Engagement (6.03): All students will “prepare themselves for responsible citizenship by fulfilling roles and responsibilities associated with membership in various organizations.” Each classroom is a mini-community. Students learn and demonstrate responsible citizenship by abiding by the rules of classroom behavior and respecting the rights all members of the class.

The FSU Policy on Disruptive Behavior (see FSU website for complete policy) identifies the following behaviors as disruptive:

1. Failure to respect the rights of other students to express their viewpoints by behaviors such as repeatedly interrupting others while they speak, using profanity and/or disrespectful names or labels for others, ridiculing others for their viewpoints, and other similar behaviors;
2. Excessive talking to other students while the faculty member or other students are presenting information or expressing their viewpoints.
3. Use of cell phones and other electronic devices
4. Overt inattentiveness (sleeping, reading newspapers)
5. Eating in class (except as permitted by the faculty member)
6. Threats or statements that jeopardize the safety of the student and others
7. Failure to follow reasonable requests of faculty members
8. Entering class late or leaving class early on regular basis
9. Others as specified by the instructor.

The instructor may take the following actions in response to disruptive behavior. Students should recognize that refusing to comply with reasonable requests from the faculty member is another incidence of disruptive behavior.

1. Direct student to cease disruptive behavior.

2. Direct student to change seating locations.
3. Require student to have individual conference with faculty member. At his meeting the faculty member will explain the consequences of continued disruptive behavior.
4. Dismiss class for the remainder of the period. (Must be reported to department chair.)
5. Lower the student's final exam by a maximum of one-letter grade.
6. File a complaint with the Dean of Students for more severe disciplinary action.

Students who believe the faculty member has unfairly applied the policy to them may make an appeal with the faculty member's department chair.

**VII. Academic Support Resources** – Use any academic support resources available in this class. In addition,

1. The Mathematics Laboratory (located at H.T. Chick 216 C) provides computer-assisted instruction and peer tutoring for students who wish to strengthen their mathematics skills. Students enrolled in MATH 260 may complete weekly assignments in the Mathematics Laboratory. Please visit <http://www.uncfsu.edu/learningcenter/math/> for lab schedules. Information on how to access and use *Smarthinking* and *Criterion* can be obtained through University College Learning Center (H. T. Chick 216 C).
2. Some instructors may use the [Supplemental Instruction Service](http://www.uncfsu.edu/learningcenter/si/) (SI). Please see your instructor's announcement for more information. (<http://www.uncfsu.edu/learningcenter/si/> )
4. Extra help or tutoring (provided by a graduate assistant) might also be available through [the Department of Mathematics and Computer Science](#), please see Ms. Briggs at SBE 339 (Tel: 910-672-1294) for detailed information.

### VIII. Course Outline and Assignment Schedule

<u>Week</u>	<u>Topics</u>
1	Sets and set operations
2	Partitions, Logic, Truth tables
3	Quantifiers and implications, Review, <b>Test 1</b>
4	Return Test 1, Proof methods, Induction
5	Induction, Pigeonhole Principle
6	Divisibility, Euclidean Algorithm, Review, <b>Test 2</b>
7	Return Test 2, Fundamental Theorem of Arithmetic
8	Relations, Equivalence relations, Partial orders, Review, <b>Test 3</b>
9	Return Test 3, Quotient spaces
10	Functions, Inverses
11	Infinite sets, Cardinal numbers, Schroder-Bernstein Theorem
12	Sequences, Review, <b>Test 4</b>
13	Return Test 4, Finite differences, Limits of sequences
14	Convergence properties, Infinite arithmetic
15	Recurrence relations, Pascal's Triangle, Fibonacci numbers
	Final Exam date will be announced.

This schedule is subject to change for the optimum benefit of the class as a whole. Therefore, it is important to stay alert and attend class regularly.

Information on other important dates and holidays is available on **Academic Calendar** via: <http://catalog.uncfsu.edu/calendar.htm>

### **IX. Teaching Strategies**

The teaching strategies for this course will be: lectures, group discussion, simulated teaching experiences, cooperative learning groups, computer experiences, singing, and playing classroom instruments and demonstration of problem solving in class. There will be a comprehensive review before each test.

### **X. Bibliography**

1. Bartle, Robert G. And Donald R. Sherbert, Introduction to Real Analysis, 3rd ed., John Wiley & Sons, Inc. 2000.
2. Smith, Eggen, and St. Andre, A Transition to Advanced Mathematics 5th. Ed. Brooks/Cole Publishing Co., 2001
3. Baker, Crump W. Introduction to Topology. Malabar, FL: Kreiger Publishing Company, 1997.
4. Devlin, Keith. The Joy of Sets: Fundamentals of Contemporary Set Theory, 2nd Ed. New York, NY: Springer-Verlag, 1994.
5. Halmos, Paul. Naïve Set Theory. New York, NY: Springer-Verlag, 2000.
6. Pickover, Clifford A. Wonders of Numbers: Adventures in Mathematics, Mind and Meaning. New York, NY: Oxford University Press, 2001.