

**Fayetteville State University**  
**College of Arts and Sciences**  
**Department of Mathematics and Computer Science**  
**MATH 250 (01) Discrete Mathematics II**  
**Fall 2010**

**I. Locator Information:**

Instructor: Dr. G Zhao  
Course # and Name: MATH 250 Discrete Mathematics II Office Location: SBE 347  
Semester Credit Hours: 3.0 Office hours: TR 2:00-3:45 & 5:00-6:00 F 2:00-4:00  
Day and Time Class Meets: TR 12:30-1:45 SBE 212 Office Phone: (910) 672-1500  
Total Contact Hours for Class: 45.0  
Email address: [gzhao@uncfsu.edu](mailto:gzhao@uncfsu.edu)

**The following statement should appear on the first page of each course syllabus:**

**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 continuation of MATH 150, including qualification and further rules of inference; formal and informal proofs, machine proofs, with attention to unification and the resolution principle; the equivalence relation as a partitioning device; further applications of graphs and trees; automata, grammars and languages; recurrence relations with application to the analysis of Algorithms; group codes as an application of group theory; Boolean algebras and combinatorial circuits.

Prerequisite: 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:** Richard Johnsonbaugh, Discrete Mathematics, 7<sup>th</sup> ed. Upper Saddle River: Prentice Hall, 2009.

**V. Student Learning Outcomes:**

Upon completion of this course, students will be able to:

1. Demonstrate an understanding of the basic principles of graph theory.
2. Demonstrate an understanding of the basic principles of Boolean algebra.
3. Demonstrate an understanding of the basic principles of computer science theory.

**VI. Course Requirements and Evaluation Criteria:**

There will be four tests, and a final exam. The lowest test score will be dropped. No make-up test will be given. In case of a planned absence (e.g. a doctor's appointment or court appearance) an in-term test may be taken early if adequate notice is given. The final exam will be comprehensive, and the final exam grade will not be dropped. Homework will be collected and graded at the end of each chapter.

The weight given to various activities for evaluation is as follows: Tests: 60%, Final Exam: 25%, Homework: 15%.

Grading Scale: A 90 – 100% B 80 – 89% C 70 – 79% D 60 – 69% F below 60

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

**VII. Academic Support Resources**

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. Please visit <http://www.uncfsu.edu/learningcenter/math/> for lab schedules. Information on how to access and use *Smthinking* and *Criterion* can be obtained through University College Learning Center (H. T. Chick 216 C).
2. Extra help or tutoring (provided by a graduate assistant) might also be available through [the Department of Mathematics and Computer Science](#).

## Course Outline and Assignment Schedule

### Section & Topic

#### Graph Theory

- 8.1 Introduction
- 8.2 Paths and Cycles
- 8.3 Hamiltonian Cycles and the Traveling Salesperson Problem
- 8.4 A Shortest Path Algorithm
- 8.5 Representations of Graphs
- 8.6 Isomorphisms of Graphs
- 8.7 Planar Graphs

#### Trees

- 9.1 Introduction
- 9.2 Terminology and Characterization of Trees
- 9.3 Spanning Trees
- 9.4 Minimal Spanning Trees
- 9.5 Binary Trees
- 9.6 Tree Traversals
- 9.7 Decision Trees and the Minimum Time for Sorting

#### Network Models

- 10.1 Introduction
- 10.2 A Maximal Flow Algorithm
- 10.3 The Max Flow, Min Cut Theorem
- 10.4 Matching

#### Boolean Algebras and Combinatorial Circuits

- 11.1 Combinatorial Circuits
- 11.2 Properties of Combinatorial Circuits
- 11.3 Boolean Algebras
- 11.4 Boolean functions and Synthesis of Circuits
- 11.5 – Applications

#### Automata, Grammars, and Languages

- 12.1 Sequential Circuits and Finite-State Machines
- 12.2 Finite-State Automata
- 12.3 Languages and Grammars
- 12.4 - Nondeterministic FSM
- 12.5 Relationships between Languages and Automata

**Final Exam:** Final exam dates will be posted at: <http://www.uncfsu.edu/registrar/>.

Information on other important dates and holidays is available on *Academic Calendar* via:

<http://forms.uncfsu.edu/scripts/publish/webevent.pl?cmd=openca&cal=cal2>

## VIII. Teaching Strategies

The majority of the material of the course will be given in lecture format. Group discussions and student presentations may be used

### Bibliography

- Aho, Alfred V. & Jeffrey D. Ullman. *Foundations of Computer Science*. New York: W. H. Freeman and Co., 1992.
- Goodaire, Edgar G., Parmenter, Michael M. *Discrete Mathematics with Graph Theory*, 2<sup>nd</sup> ed. Upper Saddle River: Prentice-Hall, 2002.
- Grimaldi, Ralph P. *Discrete and Combinatorial Mathematics*. 4th ed., Reading, MA: Addison-Wesley, 1999.
- Ross, Kenneth. *Discrete Mathematics*. 4rd ed. Upper Saddle River: Prentice-Hall, 1999.