

Fayetteville State University
College of Arts and Sciences
Department of Mathematics and Computer Science
MATH 250 (01) Discrete Mathematics II
SPRING 2012

I. Locator Information:

Instructor: Dr. Chekad Sarami
Course # and Name: MATH 250 Discrete Mathematics II Office Location: SBE 334
Semester Credit Hours: 3.0 Office hours: TR:8:30AM-9:30AM and 12:15-3:45PM
Day and Time Class Meets: MWF 11AM-12:50AM Office Phone: (910) 672-1129
Total Contact Hours for Class: 45.0 Email address: csarami@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) 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 an introduction to graph theory: graph algorithms, representations of Graphs, Planar Graphs, minimal spanning Trees, tree traversal, decision Trees, game trees, Network Models, max-flow-min-cut theorem, matching. Boolean algebra and combinatorial circuits and applications, Automata, grammars, and languages, the closest-pair problem, and convex hull.

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 (1st Floor); 910-672-1203.

IV. Textbook: Richard Johnsonbaugh, Discrete Mathematics, 7th ed. Upper Saddle River: Prentice Hall, 2009.

V. Student Learning Outcomes:

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

1. Demonstrate understanding of the basic principles of graph theory.
2. Demonstrate further applications of graphs and trees.
3. Demonstrate understanding of automata, grammars and languages.
4. Demonstrate understanding of Boolean algebras and combinatorial circuits.

VI. Course Requirements and Evaluation Criteria:

There will be three homework, 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%, Homework: 10%. Class Attendance and Participation: 5%, Final Exam: 25%,

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.

Late Submission Policy

MATH250 allows 5 "late days" with a maximum allocation of two days per assignment. You must turn those in during lecture at their specified due time. We will accept on-time written homework submissions by email if, due to extraordinary circumstances, you are unable to attend lecture when the assignment is due. Please do not abuse this. Every day of late submission will reduce the grade by 10%.

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 (Tentative)

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: [_http://www.uncfsu.edu/registrar/pdf/FinalExamSpring.pdf_](http://www.uncfsu.edu/registrar/pdf/FinalExamSpring.pdf)

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

<http://catalog.uncfsu.edu/calendar.htm#spring>

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

IX. 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, 2nd 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.