Math 298   Graph Theory   Spring 2007

Class meetings: M, W, F 8:50 a.m. to 10:00 a.m. in PPHAC 117
Instructor: Kay Somers
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Office: PPHAC-220
Office Hours: Monday, Wednesday, Thursday, and Friday, 11:00 to 11:50 a.m. and by
appointment.

Required text: *A Friendly Introduction to Graph Theory,* Fred Buckley and Marty Lewinter,
(2002), Prentice Hall.

Graph theory deals with the study of graphs that consist of a finite set of points connected by
lines. (These are not the graphs with which you are familiar from calculus, and graph paper will
not be helpful in constructing these graphs!) Problems will be formulated and analyzed in
diverse areas such as transportation and project networks, organizational structure, tournaments,
group structure in psychology and sociology, and scheduling.

We will begin with Chapter 2 in the text "Introduction to Graphs and their Uses" and return the
topics in Chapter 1 "Introductory Concepts" as needed. We will explore most of the topics in
Chapters 3 through 10, which include trees, bipartite graphs, distance and connectivity, Eulerian
and Hamiltonian graphs, graph coloring, matrix representations of graphs, algorithms, planar
graphs, and digraphs and networks.

Course goals: After completing this course, successful students will:

- know how to formulate, analyze, and think creatively about relevant questions and ideas
  involving graphs and digraphs;
- be able to use the appropriate language and notation of graph theory;
- understand relationships between graph theory and other areas of mathematics;
- model and analyze appropriate situations using graph theory; and
- be able to explain clearly, both orally and in writing, the results of their analyses and how
  these results relate to the context from which they were obtained.

Homework: Since mathematics can only be learned and understood by doing, regular reading
and homework problems will be assigned during each class and usually will be discussed during
the next class. You are expected to come to class prepared to explain problem solutions and ask
questions.

The homework will involve a variety of types of activities, including some writing assignments
and some longer assignments that could be called projects. Some of these outside–of-class
assignments will be collected and graded. In all homework assignments that will be graded, you

will be told in advance that the work will be collected. Late homework will be accepted only if you are absent due to illness or emergency. You are encouraged to study and work together on **ungraded** assignments; **however, all homework that is to be collected and graded is to be done <u>individually</u> unless otherwise noted.**

Academic Honesty: For graded homework assignments, you may use your class notes and any books or library sources. However, you may not use the help, orally or in written form, of any individual other than your instructor unless it is specifically a group assignment, and you may not copy someone else's work or allow someone else to copy your work. If an assignment is completed by a group of two or more people, each person who contributed to the work must put his or her name on the work. The College academic honesty policy appears in your Student Handbook; you are expected to be familiar with it. The *Academic Honesty Policy Guidelines* specific to mathematics classes are clarified at the end of this syllabus. They apply to work done outside of class as well as to in-class quizzes and tests. Please read them carefully. If you are unsure about the propriety of a particular procedure or approach for completing assigned work in this course, please consult with your instructor before continuing with the assignment.

Grading: In addition to homework and projects, there will be three hour exams, and a mandatory, cumulative final exam. Your course grade will be computed as follows:

graded homework, projects and class participation	35% of your grade
three hour exams	45% of your grade
cumulative final exam	20% of your grade.

The three hour exams are tentatively scheduled for the following dates:
Friday, February 2
Friday, March 16
Monday, April 16

You are responsible for knowing about any changes to the test dates made during class.

Attendance: You are required to attend all classes. Some of the graph theory concepts will be demonstrated through class activities done in small groups during class. In order to participate, you must be in class. *Warning: This course will involve an interactive classroom, with significant participation expected on your part.*

You are also responsible for obtaining all class handouts and keeping them organized. Students should inform the instructor of any unavoidable absence in advance, if possible. Make-up exams will be given only in the case of a documented illness. You are encouraged to ask questions in class and to see Dr. Somers for extra help outside of class.

Classroom etiquette: You need to come to class prepared. This means that you have carefully read the assigned material, you have worked (seriously) on the assigned problems and you have your notebook, your textbook, and anything else you anticipate needing with you. You are ready

to ask and answer questions in class and to work with your classmates on any in-class group activities. This classroom needs to be a place where everyone feels comfortable asking and answering questions; you are expected to treat everyone in class with respect. You need to turn off your cell phone and any other electronic devices (except calculators or computers, of course) and put them away during class. Finally, you are expected to be on time for class, to stay until class is over and not leave the class unless there is an emergency. (It is very disruptive to everyone, but especially to your instructor, to have people walking in and out of the classroom.)

Technology: We will use the computer program *Maple* to help explore graphs and to understand and solve some problems in this class.

Special Accommodations: Students with disabilities who believe that they may need accommodations in this class are encouraged to contact the Learning Services Office as soon as possible to enhance the likelihood that such accommodations are implemented in a timely fashion.

ACADEMIC HONESTY POLICY GUIDELINES

MATHEMATICS COURSES

The Department of Mathematics and Computer Science supports and is governed by the *Academic Honesty Policy of Moravian College* as stated in the Moravian College Student Handbook. The following statements will help clarify the policies of members of the Mathematics faculty.

In all homework assignments which are to be graded, you may use your class notes and any books or library sources. When you use the ideas or thoughts of others, however, you <u>must</u> acknowledge the source. For graded homework assignments, you may not use a solution manual or the help, orally or in written form, of an individual other than your instructor. If you receive help from anyone other than your instructor or if you fail to reference your sources you will be violating the *Academic Honesty Policy of Moravian College* .   For homework which is not to be graded, if you choose, you may work with your fellow students. You are responsible for understanding and being able to explain the solution of all assigned problems, both graded and ungraded.

All in-class or take-home tests and quizzes are to be completed by you alone without the aid of books, study sheets, or formula sheets unless specifically allowed by your instructor for a particular test.