

Math 214 Mathematical Methods in Operations Research
Spring 2011

Class meetings: Monday, Wednesday, and Friday, 8:55 to 10:05 a.m., PPHAC 330

Instructor: Kay B. Somers

E-mail: somersk@moravian.edu

Telephone: 610-861-1403

Office: PPHAC-220

Office Hours: Monday, Wednesday, and Friday, 11:45 a.m. to 12:45 p.m.; Thursday, 3:00 to 4:00 p.m., and by appointment or whenever you find me in my office.

Text: Taha, Hamdy A. (2011). *Operations Research*, Ninth Edition. Upper Saddle River, NJ: Prentice Hall.

Course Goals: Operations Research is the scientific or mathematical approach in the decision making and management of organizations and groups. We will investigate various types of decision problems and how to solve them with appropriate quantitative methods. After completing this course, successful students will:

- have an understanding of how mathematical models are constructed and gain experience setting up their own models.
- be able to effectively implement solution procedures for a variety of models, and interpret data and draw conclusions based on these models.
- understand that the purpose of mathematical modeling is to answer questions and make informed decisions.
- understand the role of probability and uncertainty in mathematical modeling.
- be able to explain clearly, both orally and in writing, how the results of a mathematical modeling process relate to the context from which they were obtained.

Topics: The course will include the following topics from the text:

Chapter 1: What is Operations Research?

Chapters 2, 3, and 4: Linear Programming, the Simplex Algorithm, Sensitivity Analysis, and Duality.

Chapter 5: Transportation and Assignment Models.

Chapter 6: Network Models.

Chapter 15: Decision Analysis and Games.

Chapter 18: Queuing Theory, if time allows.

Homework: Since mathematics, like sports, can only be learned and understood by being actively involved, homework problems will be assigned during each class and usually will be discussed during the next class. The homework will involve a variety of types of activities, including some writing assignments and some longer assignments, or 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. 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 individually unless it is specifically assigned as a group project.** Late homework will be accepted only if you are absent due to illness or emergency.

Recognized standards of honesty are part of the foundation on which the integrity of an academic community rests. Accordingly, the Moravian College Faculty in 1986 adopted a statement on Academic Honesty, the standards of which will be strictly applied in this course. You are encouraged to read carefully the description of this policy that is printed in your Student Handbook, and the clarification for mathematics courses on the last page of this syllabus. If you are unsure about the propriety of a given procedure or approach for completing assigned work in this course, you should consult with the instructor before completing the assignment.

Technology: We will use the computer program *Maple* and some of the programs that are discussed in your textbook to help understand and solve some problems in this class. A very interesting website containing information about Operations Research and many relevant links is the website for the professional organization INFORMS: www.informs.org

In-class assessment: Working on the daily, ungraded homework problems and in-class activities is an important part of your learning process. To make sure you understand these problems and activities, we will normally have a short quiz each Friday. In addition, there will be two hour exams and a cumulative final exam. The hour exams will be given on the following dates:

Friday, February 18
Friday, April 1

The final exam, scheduled by the registrar, will be on Tuesday, May 3, 8:30 a.m.

You are responsible for knowing about any changes to the test or quiz dates made during class. Make-up exams will be given only in the case of a documented illness or emergency.

Grading: Your course grade will be based on class participation (10%), graded homework and projects (25%), two hour exams (15% each), in-class quizzes (your two lowest quiz grades will be dropped) (15%), and a cumulative final exam (20%).

Attendance and Classroom Etiquette: Attendance and participation in class are essential. It is **extremely** difficult to catch up once you have fallen behind. Please be on time, plan to stay for the whole class (that is, do not leave the classroom unless there is a dire emergency), and turn off all electronic equipment while you are here. You are responsible for all work covered in class and all assignments, even if absent from class. If you must miss a class, please notify Dr. Somers by e-mail or telephone beforehand, if possible. You are strongly encouraged to ask questions in class.

Extra help You are encouraged to see Dr. Somers for extra help during office hours or to arrange an appointment for extra help, if needed. The Writing Center is also a good resource; the Writing Center is located in a building that is not accessible to persons with mobility impairments. If you need the services of the Writing Center, please call 610-861-1392.

General recommendations for success

- Be on time for class and stay focused on the work of the class during the entire period. (Temporarily forget about text messages, e-mail, other coursework, and so on.)
- Keep a reliable record of all assignments, if they are to be collected or not, and when they are due.
- Prepare for each class by completing the reading assignments. When you read, read with pencil or pen and paper in front of you, and take notes, write out definitions in your own words, create your own examples, work out the examples in the text, and write down your questions.
- Keep an organized three-ring binder that contains all completed classroom activities, exams, and other course material, including your notes taken during class and your notes on the readings.
- Begin to work on the homework problems, writing assignments, and papers as soon as they are assigned.
- Find one, two, or more students from this class with whom to discuss the course material outside of class.
- Come see me for help whenever you have unanswered questions.

Accommodations: Any student who wishes to request accommodations under the Americans with Disabilities Act (ADA) for this course should contact Mr. Joe Kempfer, Assistant Director of Learning Services for Disability Support, 1307 Main Street (extension 1510.) Accommodations cannot be provided until authorization is received from the Office of Learning Services.

Possibility of changes: This syllabus is a guideline for the course. It may be necessary to make changes during the semester. I will announce any changes in class.

Academic Honesty Policy Guidelines Mathematics Courses

The Mathematics and Computer Science Department 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 for mathematics courses.

In all homework assignments that 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 must acknowledge the source. For graded homework assignments, you may not use a solution manual or the help, orally or in written form, of any 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 that 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.

In addition to the above guidelines, you may be asked to sign the following pledge when you hand in your assignments:

I have completed this work using only allowable resources, and have not consulted anyone other than my instructor in the process of completing this assignment.

Signed: _____

Date: _____