Math 214 – Spring 2007
Mathematical Methods in Operations Research

Ben Coleman
coleman@cs.moravian.edu
214 PPHAC
Office Phone: 610-625-7781

Office Hours: MW 9:00 – 10:00
R 9:00 – 11:00
or by appointment
AIM: bjcoleman15

Course Description

Introduction to mathematical techniques to model and analyze decision problems. Linear programming, including sensitivity analysis and duality, network analysis, decision theory, game theory, and queuing theory.

Course Goals

- Construct mathematical models for real-world problems.

- Apply mathematical techniques to solve models, and interpret and draw conclusions from their results.

- Describe the role of probability and uncertainty in mathematical modeling

- Communicate both orally and in writing the details of a mathematical model and its results.

Course Texts

In addition to the following required texts, supplementary readings will be given periodically during the semester.

- *Introduction to Operations Research* 8th Edition by Frederick S. Hillier and Gerald J. Lieberman

You should expect to spend at least an hour before each class session working through the readings. This means reading the text for detail, not just skimming through the material before class.

Student Responsibilities

Your timely attendance is expected at each class meeting. You are also responsible for the contents of reading assignments, handouts, class activities, and class email. Please turn off all electronic devices during class.

If you have a disability that may affect your participation in this course, please contact me immediately to discuss academic accommodations.

Graded Materials

- Homework will be assigned nearly every class session. Some problems will simply ask you to apply the mathematical technique while others will require written responses that explain a process or justify an answer. Most of the problem will fall between these two extremes and require both computation and writing. Many of the problems will utilize computer software to both avoid simple computation and extend the reasonable size of the problems.

    Periodically throughout the semester, you will be asked to consider larger problems or case studies. These problems will require more time to complete and consequently will be weighted higher for grading.

- Three tests will be given during the semester on Friday, February 16, Friday, March 16, and Friday, April 13. Each test will be given in class, and may only be re-scheduled for medical or family emergencies. In such a situation, you must see me *before* the time of the test.

- The final will be cumulative and will be given in class during its schedule time.

- Mathematics is best learned by solving problems. Occasionally I will lecture on a topic, but most of the time we will explore the content together through a variety of activities. You are expected to participate in these activities and be engaged during class.

Topics

- Chapter 2 – Overview of Operations Research
- Chapter 3, 4, 5, 6 – Linear Programming, Sensitivity Analysis and Duality Theory
- Chapter 8 – Transportation and Assignment Problems
- Chapter 9 – Network Optimization Models
- Chapter 14 – Game Theory
- Chapter 15 – Decision Analysis
- Chapter 20 – Simulation

Academic Honesty

You are encouraged to discuss the material from the course and work with other students in the course. Specifically, on homework you may discuss any portion of the assignment with your fellow students. However, you must produce your own write-up of the material, and you are ultimately responsible for the material on the tests.

Grade Determination

Attendance and Participation	10%	A : 90 − 100%
Homework	30%	B : 80 − 89.9%
Tests	15% each	C : 70 − 79.9%
Final	15%	D : 60 − 69.9%
		F : < 60%