

# **Dillard College of Business Administration**

## **Syllabus: Quantitative Methods**

### **MGMT 4033**

Spring Semester

### **Contact Information**

Instructor: Dr. Mike Patterson, Professor of Management

Office: Dillard Building 203

Office hours: TTh 11:00 a.m.-12:30 p.m. and W 9:00 a.m. – 11:00 a.m.

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### **Course Materials**

1. Levin, Rubin, Stinson and Gardner, Quantitative Methods, Primis Online, McGraw-Hill/Irwin, ISBN 0-390-56166-5. **Required**

2. Patterson, Management Science Programs for the IBM Personal Computer, 3rd ed., Kendall-Hunt Publishing, ISBN: 0-7872-6792-9. **Required.**

### **Course Description**

Methods and application of operations research including topics such as linear programming, waiting line theory, PERT, networks, transportation, assignment, dynamic, and goal programming.

### **Course Prerequisites**

Junior or Senior standing or consent of Department Chair and BUAD 3033

### **Learning Goals**

#### **I. General Learning Goals:**

- Understand the role of quantitative modeling in business and economics. Students will practice problem-solving and decision-making skills during in-class discussions. Assessment will occur on both homework assignments and course examinations.

These general learning goals are among those established by the Dillard College of Business Administration. General learning goals represent the skills that graduates will carry with them into their careers. While assessing student performance in obtaining these general learning goals, Dillard College is assessing its programs. The assessments assist us as we improve our curriculum and curriculum delivery.

II. **Course-Specific Learning Goals:** Upon completion of the course students will have a basic knowledge of and understanding of the following database components, concepts, and applications.

- Define and discuss the fundamentals of linear programming model formulation and interpretation.
- Explore the role of mathematical modeling in multi-objective programming, transportation, assignment, and dynamic programming
- Understand the PERT and CPM approach to managing projects and other network models such as the minimal spanning tree and shortest path algorithm.
- Define and discuss the basic concepts involved with waiting line models.

## **Course Policies**

**Attendance Policy:** Regular attendance is expected. See the university catalog for the University Class Attendance Policy. Each meeting of the class will run as scheduled. So as not to disturb the class, you are not to walk in and out of the classroom during the class hour except for an emergency. As a courtesy to all concerned, please silence all pagers and telephones when entering the classroom.

Students are required to attend every scheduled class session. Each unexcused absence that exceeds six (four in summer school) will result in a two-point deduction at the end of the semester average grade. Unexcused absences are defined as follows:

1. A student fails to attend class and has no approved documentation for the absence.
2. A student arrives after the class roll is taken, which will generally be recorded no earlier than 10 minutes after the scheduled start time for the class.
3. A student leaves the classroom before the class session is dismissed.

Excused absences for university-related activities, medical reasons, and traffic-related incidents must be supported by appropriate documentation.

No electronic devices are allowed in the class. This includes computers, phones, headphones, etc. If such devices are observed during class, students will be asked to leave the classroom which will be recorded as an unexcused absence.

## **Other Related Policies**

**If a student misses a regularly scheduled exam, the student must immediately notify the instructor of his/her intention to schedule a make-up exam. There is no other recourse available for a missed exam in the class. The exam dates are tentative and subject to change.**

## **Grading and Evaluation:**

**Homework Problems** - Each is a requirement of the class. You are required to complete 13 of the 18 assignments. Each homework assignment must be turned in on time. All homework is due within two weeks of the completion of lectures (one week for the summer semester) related to the homework topics, with the exception of homework assigned at the end of the semester. Due dates for end-of-semester homework will be announced. A one-point deduction from the semester average will be calculated at the end of the semester for each missing or late homework assignment.

Grades will be determined on the basis of the total points earned on five 100-point exams and any missing or late homework assignments. A calculator may be allowed for exams and quizzes. The calculator must be a regular hand-held calculator. No other electronic devices are allowed.

### **Letter grades will be given according to the following scale:**

A	450-500 points (>90%)
B	400-449 points (80%-89%)
C	350-399 points (70%-79%)
D	300-349 points (60%-69%)
F	Below 300 points (<60%)

- The results of your exams and homework will be posted periodically on D2L
- It is the responsibility of the student to assure that homework is being received and proper credit is given.
- Semester grades will be reported through normal University channels with no exceptions.

Course Content and Outline:			homework
Week	Topic Outline: Hours	Textbook	
1-2	Linear Programming		
	Graphic Method	7	Page 1-75
	Technical Issues		1-2
	Computer Applications		
	Simplex Method		
3	<b>Exam one (tentative date 01/30/2024)</b>		
3-5	Linear Programming	8	Pages 1-75
	Maximization vs. Minimization		
	Problem Examples		
	Setting up for the Computer		3-4
	Shadow Prices		
	Homework		
6	<b>Exam Two (tentative date 02/20/2024)</b>		
6-9	Goal Programming	6	Pages 189-213
	Comparison to Linear Programming		5-6
	Setting up computer solutions		
	Interpretations of output		
	Homework		
	Assignment Method	4	Pages 129-143
	Basic Concepts		7-8
	Homework		
9	<b>Exam Three (tentative date 03/19/2024)</b>		
9-12	Transportation Problem	4	Pages 91-129
	Introduction		
	Interpreting Input/output		
	Homework Assignments		
	Dynamic Programming	6	Pages 156-170
	Shortest Route Problem		11-12
	Basic Knapsack Problem		
	Applications		
	Homework		
12	<b>Exam Four (tentative date 04/09/2024)</b>		
13-15	Waiting Line Models	5	Pages 207-213
	Descriptive Systems		13-14
	Normative Systems		

	Simulation of Waiting Lines			
	Homework Assignments			
	Minimal Spanning Tree Model	2	Pages 156-170	15-16
	Network Models		Pages 156-170	
	PERT/CPM	3		
	Cost Considerations			
	Homework Assignments			17-18
15	<b>Exam Five</b> (tentative date 05/09/2024)			

### **Academic Integrity:**

With regard to academic honesty, students are referred to the "Student Honor Creed" of Midwestern State University Undergraduate Catalog.

### **Americans with Disabilities Act:**

This class follows the guidelines suggested by Disabilities Support Services for those students who qualify for disability services. See Midwestern State University Undergraduate Catalogue, Services for Students with Disabilities.

### **Syllabus Change Policy:**

This syllabus is a guide for the course and is subject to change.

### **Additional Information:**

Operations Homework Notes

Homework assignments for this class are located on the Dillard server drive Y. These files may be accessed in the Dillard computer labs on the first and third floors (146, 306, 324 and 335).

Computer Icon  
Coursework(Y :)  
Mike Patterson  
homeworkdocuments  
quantitativemethods  
qmhomework.doc

### **Homework Documents**

- You are provided with a set of blank documents for homework.
- These homework assignments are very similar to the types of problems which will be on the exams.

- **If you lose your homework copies, these may be downloaded from D2L or the computer lab server on drive**  
**Y:\coursework\MikePatterson\homeworkdocuments\opshomeworkmaster.doc.**
- **Homework assignments should be e-mailed to my graduate assistant at the following**
- **e-mail address: [patterson.homework@msutexas.edu](mailto:patterson.homework@msutexas.edu).**

### **Homework Assignments**

(13 of the 18 are required to avoid grade deductions for the semester)

- 1 Handout - RediKleen Corp. Linear Programming
- 2 Problem 2, page 75
- 3 Problem 6, page 76
- 4 Problem 25, page 83
- 5 Crescent Products Inc.
- 6 Problem 25, page 203
- 7 Problem 6, page 149
- 8 Problem 22, page 151
- 9 Problem 11-11, page 147
- 10 Problem 11-10, page 147
- 11 Golf ball Problem from Class
- 12 Training Program Problem from Class (Shortest Path)
- 13 Homework Queuing #1 Handout
- 14 Homework Queuing #2 Handout
- 15 Problem 27, page 164
- 16 Problem 38, page 168
- 17 Problem 7, page 157
- 18 Problem 9, page 159

Quantitative Methods	Homework Assignments	13 of 18 are required to avoid point deductions for semester
Number	Assignment	Best Payoff
1	Hand-out RediKleen Problem	2.72
2	Problem 2, page 75	5,538.XX
3	Problem 6, page 76-77	770
4	Problem 25, page 83-84	907.7
5	Crescent Products Inc. (Handout)	Ultras 3,500
6	Problem 25, page 203	Earning Goal met Ag. Loan 230
7	Problem 16, page 149	4,300
8	Problem 22, page 151	40
9	Problem 11, page 147	119,987.5
10	Problem 10, page 147	540
11	Golf ball Problem from Class	2,900
12	Training Program Problem from Class (Shortest Path)	30
13	Homework Queuing #1 Handout	Optimum # clerks = 2 Total Cost 2 clerks =25.44
14	Homework Queuing #2 Handout	Average Number on System Daily=11
15	Problem 27, page 164	1,125
16	Problem 38, page 168	22
17	Problem 7, page 157	37
18	Problem 9, page 158	42

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**Software:**

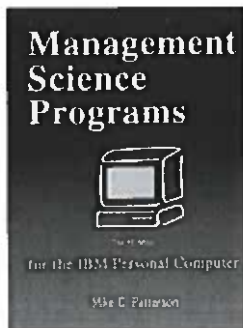
mgmtsci.exe recommended software for newer computers with 32 and 64-bit operating system

Management Science Programs for the IBM Personal Computer

Found in Dillard Computer Labs –Y drive, Mike Patterson

mgmtsci.exe

Can be purchased from Midwestern Book Store or on-line from



Kendall-hunt publishing

How to hide/unhide files

show hidden files

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