**Debre Markos University**

**College of Business and Economics**

**Department of Management**

**MBA- Program**

***Course plan***

*Program: MBA**Year:*

Course Title: Operation Research Academic Year: 2012 E.C

Course Code: MBA 641

Credit Hours: 3

Instructor: ***Wasihun Tiku (PhD) Email: wasihuntiku21@gmail.com***

**Course Description:**

Operations Research (OR) as one of the quantitative aid to decision making offers the decision-maker a method of evaluating every possible alternative (act or course of action) by using various techniques to know the potential outcomes. It includes Models and modeling, linear programming, transportation models, assignment models, decision models, project management techniques, and queuing models

**Course Objective:**

**By the end of this course, students will be able to:**

* Know the significance of OR in managerial decision making
* Understand the different models of OR.
* Appreciate the application of OR models in solving different quantitative problem.

**Course Outline**

**CHAPTER 1 - INTRODUCTION TO OPERATIONS RESEARCH**

* 1. The History Of Operations Research
	2. Definition Of Operation Research
	3. Nature and significance of operations research
	4. Features of Operations Research
	5. Model and Modeling in Operations Research

**CHAPTER 2 - LINEAR PROGRAMMING**

2.1. Introduction

2.2. Structure of Linear Programming Model

2.3. Application Area of LP

2.4. Graphical Solutions of LPP

2.5. Special Case in LPP

2.6. The Simplex Method

2.7. Some complication and their Resolution

 2.7.1. Unrestricted variables

 2.7.2. Tie for leaving and entering variables

2.8. Duality in LPP

2.9. Sensitivity Analysis

2.10. Integer

**CHAPTER 3 - TRANSPORTATION AND ASSIGNMENT PROBLEMS**

3.1. Introduction

3.2. Methods for Finding Initial Solution

3.3. Test for Optimality

3.4. Variation in Transportation

 3.4.1. Unbalanced supply and demand

 3.4.2. Degeneracy

 3.4.3. Alternate optimal solution

 3.4.4. Prohibited transportation routes

3.5. Maximization Transportation problems

3.6. Solution method for Assignment problem

3.7. Special case in Assignment Problems

**CHAPTER 4 - DECISION THEORY**

4.1. Introduction

4.2. Types of Decision Making Environment

4.3. Decision making under Uncertainty

4.4. Decision making Under Risk

4.5. Decision making Under Certainty

4.6 Decision Making with Utilities

**CHAPTER 5 - NETWORK MODELS (Group Ass)**

5.1. General network concepts

5.2. Networking algorithms

5.3. Basic Difference Between PERT and CPM

5.4. PERT/CPM Network Components and precedence Relationship

5.5. Critical Path Analysis

 5.5.1. Forward pass method

 5.5.2. Backward pass method

5.6. Project Scheduling with Uncertain Activity Times

5.7. Project cost and Crashing

**CHAPTER 6 - GAME THEORY**

6.1. Introduction

6.2. Two person Zero-Sum Game

6.3. Pure Strategies: Game with Saddle Point

6.4. Mixed Strategies: Game with out Saddle Point

6.5. The Rule of Dominance

**CHAPTER 7- QUEUING MODELS (WAITING LINES) (Group Ass)**

* 1. Introductions
	2. Characteristics of waiting line system
	3. Measures of system performance
	4. Queuing models: infinite source
	5. Queuing models: finite source
	6. Other approaches

**Assessment Techniques**

*Test ----------------------------------20%*

*Individual& Group assignment ----------------------30%*

*Final exam ----------------------------------------------50%*

**References:**

* V. J. Stevenson; Introduction to management science, Richard D. Irvvin Inc. 1991.
* J K Sharma: *Operations Research, Theory and Application*, Second Edition, 2003.
* M.P. Gupta R.B. Khanna, Quantitative techniques for decision Making New Delhi 2004
* Anderson, Sweeney, and Williams (1988), An introduction to Management Science: quantitative approaches to decision making, 5th ed. West publishing. Co.
* Gupta Prem Kumar (2007), Operations Research, S. chand and Company LTD. New Delhi, India
* Turban and Meredith. Management science, 6th ed. IRWIN.
* Render and Stain. Quantitative Analysis for Management, 6th ed. Allyn and Bacon.
* Taylor III Bernard W. (1986), Introduction to Management Science, 5th ed. Prentice Hall, Englewood Cliffs, New Jersey,
* Any book on management science, Qualitative analysis for managerial decision making or Operations research