Estd 1864

Forman Christian College, Lahore
(A Chartered University)
Department of Mathematics
Spring 2023

Instructor Information:

Kamran Azhar
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Office hours:
Mon,Wed, Fri:: 9:00a.m to 9:50 a.m & 11:00a.m to 11:50 a.m
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Course Information:

Operations Research
Math - 304
3 credits
Prerequisite: Math-103

Recommended Text:

Operations Research: An Introduction, 8 th edition by Hamdy A. Taha.

The CD at the back of the book contains Tora Software and the Excel spreadsheets. Students may use these spreadsheets and Tora Software to solve the problems.

Course Objectives:

This course is an introduction to the major topics of Operations Research. It provides an overview of linear programming with its application in real world. The objective of the course is to enable students to use OR techniques and algorithms efficiently which have a wide range of applications in agriculture, industry, transportation, economics, engineering, military, behavioral and social sciences.

Learning Outcomes:

Students will be able to

- Recognize the linear programming problems.
- Relate Primal Lp Model with Dual Lp Model.
- Formulate the given problems.
- Apply taught methods to solve the problems.
- Do Sensitivity Analysis.
- Justify the steps involved in the computations of different algorithms taught.

Course Requirements:

Assignments will be given as mentioned in course outline below. All assignments are to be completed by the date mentioned on the assignment paper. Students are expected to attend every class and to arrive at each class on time and remain in class for the entire class period. Instructor may choose to lower a student's grades because of tardiness. The instructor will post office hours after the semester commences. Consult the instructor during office hours. If your visit may tend to be lengthy, make an appointment with the instructor so that he may set aside some time for you. Cellular phones will be turned off while the student is in the classroom. Individuals are expected to be cognizant of what a constructive educational experience is and respectful of those participating in a learning environment. Failure to do so can result in disciplinary action up to and including expulsion. Cheating or coping others work is unethical, student involved in doing so will be dealt according to university rules.

Course Content:

Introduction to operations research, graphical LP solution, graphical sensitivity analysis. simplex method, M-method, Two Phase Method and Special Case in the Simplex Method Application. Primal Dual relationships, Dual Simplex Method, Transportation Algorithm, Assignment Model, Transshipment model. Minimal Spanning Tree algorithm, shortest route problem, queuing theory

Course Evaluation:

Grading will be based on following criteria:

Assignments (2)	10%
Quizzes (4 and 3 will be considered)	15%
Class Participation	05%
Mid Term	30%
Final Exam	40%

Assignments must be submitted on due date. Late submission may result in deduction of points. The grading system for the course is as follows:

Grades	Quality Points	Numerical Value	Meaning
A	4.00	93-100	Superior
A-	3.70	90-92	
B+	3.30	87-89	
B	3.00	83-86	Good
B-	2.70	80-82	
C+	2.30	77-79	
C	2.00	73-76	Satisfactory
C-	1.70	70-72	
D+	1.30	67-69	
D	1.00	60-66	Passing
F	0.00	59 or below	Failing

Course Outline:

Week	Topics	Assesments
1	Introduction to the course; Introduction to linear programming	
2	Graphical LP Solution.	
3	The Simplex Method and its special cases in the application.	**Quiz#1**
4	M-method;	
5	Two – Phase Method.	**Assignment #1**
6	Graphical sensitivity Analysis.	**Quiz#2**
7	Primal – Dual Relationships	
8	Dual Simplex Method	**Mid Term Exam**
9	Generalized Simplex Algorithm	
10	The Transportation Algorithm	
11	The Assignment Model	**Assignment #2**
12	The Transshipment Model	**Quiz#3**
13	Minimal Spanning Tree Algorithm	
14	Shortest – Route Algorithms.	**Quiz#4**
15	Queuing Theory	
	Final Exam(Will be from full course)	