



QURTUBA UNIVERSITY

Of Science and Information Technology

D.I Khan, Peshawar Khyber Pakhtunkhwa, Pakistan.

Course Name	Operations Research
Course Code	MGT501
Semester	Fifth
Credit Hours	03
Total Weeks	16/18
Total Hours	48/54
Total Marks	100
Pre-requisite	None

Course Objectives

This module aims to introduce students to use quantitative methods and techniques for effective Decisions–making; model formulation and applications that are used in solving business decision Problems.

Grading Criteria

Distribution	Weight
Quizzes, Assignments, and class participation	10
Mid Term	20
Final Term	70
Total	100

Recommended Books

- Anderson, Sweeney & Williams, “An Introduction to Management Science: Quantitative Approaches to Decision Making, South-Western, 2003.
- Hillier, F. S. & Lieberman, G. J., “Introduction to Operations Research”, Mc Graw-Hill, 1995.
- Operation Research, Hamdy A. Taha, 8th edition
- An Introduction to Management Science, EB Anderson, 13th edition

Soft Ware Application:

- TORA.

WEEK WISE BREAKDOWN

Week	Description
1	Introduction to Operation Management <ul style="list-style-type: none"> ◇ Overview ◇ Uses of operation management in decision management ◇ Quantitative analysis ◇ Model Development ◇ Data preparation ◇ Model solution
2	Introduction to Operation Management <ul style="list-style-type: none"> ◇ Models of Cost and Volume ◇ Revenue and Volume ◇ Profit and volume ◇ Break even analysis ◇ Management science techniques ◇ Introduction to TORO Soft ware
3	Introduction to Linear Programming <ul style="list-style-type: none"> ◇ Simple maximization LP problem Formulation/ examples ◇ Simple minimization LP problem Formulation/ examples
4	Introduction to Linear Programming <ul style="list-style-type: none"> ◇ Graphical maximization LP problem Formulation/ examples ◇ Graphical minimization LP problem Formulation/ examples ◇ Primal / Dual Conversion
5	LP: Sensitivity Analysis and Interpretation of Solution <ul style="list-style-type: none"> ◇ Optimality Range Analysis or Objective-Function Range Analysis ◇ Feasibility analysis or Right Hand Side (RHS) Range Analysis ◇ TORA application/ interpretation
6	LP: Sensitivity Analysis and Interpretation of Solution <ul style="list-style-type: none"> ◇ Selected LP applications on TORA ◇ Loan Policy Model ◇ Single-Period Production Model ◇ TYCO Toy Manufacturer
7	LP: Post Optimality Analysis and Interpretation of Solution <ul style="list-style-type: none"> ◇ Changes Affecting Feasibility <ul style="list-style-type: none"> ○ When RHS of the constraints is changed ○ A new constraint is added
8	LP: Post Optimality Analysis and Interpretation of Solution <ul style="list-style-type: none"> ◇ Changes Affecting Optimality <ul style="list-style-type: none"> ○ Changes in the original objective coefficients. ○ Addition of a new variable
	Two Assignments + Two Test Mid Term Exam
9	Transportation Model and its Variants <ul style="list-style-type: none"> ◇ Transportation models ◇ Assignment Models
10	Transportation Model and its Variants <ul style="list-style-type: none"> ◇ Transshipment models ◇ Production scheduling and inventory application model

11	Network Models ◇ Minimal spanning tree model ◇ Shortest-route model ◇ Maximum-flow model
12	Network Models (Project Scheduling: Use of PERT/CPM Models) ◇ Project scheduling with known/certain activity times
13	Network Models (Project Scheduling: Use of PERT/CPM Models) ◇ Project scheduling with unknown/uncertain activity times
14	Integer Programming ◇ Capital budgeting: an application of IP ◇ Stock portfolio selection: another application of IP
15 & 16	◇ Making daily life Different Models and its Implementation on TORA
	Two Assignments + Two Test+ Presentation Final Term

Learning Outcomes:

- Identify and develop operational research models from the verbal description of the real system.
- Understand the mathematical tools that are needed to solve optimization problems.
- Use mathematical software to solve the proposed models.
- Develop a report that describes the model and the solving technique, analyze the results and propose recommendations in language understandable to the decision-making processes in Management Engineering.