IM 423- Operations Research

Hour: Lecture: 2 Hrs. Tutorial: 2 Hrs. Credit: 3.
Coordinator: Basem Roshdy

Text Book:

- F. Hillier and J. Lieberman, "Introduction to Operations Research", McGraw Hill, latest edition.

Specific course information

a. The course provides the basic concepts and fundamentals of management science, problems addressed by operations research, and problem formulations in linear programs. It includes the graphical solution of linear programs, simplex method, transportation model, assignment model, network planning, and critical path and PERT methods.
b. Prerequisite: 90 Credit hours
c. Designation: Required

Specific goals for the course:

- An ability to apply knowledge of mathematics, science, and engineering.
- An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- An ability to identify, formulate, and solve engineering problems.
- An ability to use the techniques, skills, and modern engineering tools necessary for Mechanical engineering practice.

Course instruction outcomes:

- The students will be able To promote the scientific approach to solve management problems.
- The students will be able To build up capability to construct mathematical models of practical problems and solve them.
- The students will be able To acknowledge the role of computer technology in solving problem of operations research.

Student outcomes:

A, C, E, K

Topics Covered:

- Course Overview.
- Linear Programming.

- Graphical Method.
- Linear Programming Applications.
- The Simplex Method.
- Transportations Method – Formulation and Initial Solution.
- Transportations Method – Finding the Optimal Solution.
- Assignment Method.
- Critical Path Method.
- Probabilistic Approach, Project Evaluation and Review Technique (PERT).
- Project Crashing
- Network Analysis – Shortest Route and Minimal Spanning Tree.
- Network Analysis – Maximal Flow.

Course / credit hours	Math & Basic Sciences	Engineering Topics	General Education
Operations Research /3	2	1	