

IM 423- Operations Research

CREDIT HOURS

3 Hours

CONTACT HOURS (Hours/week)

Lecture: 2; Tutorial: 2

COURSE COORDINATOR

Dr Basem Roushdy

TEXT BOOK:

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

COURSE DESCRIPTION:

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.

PREREQUISITE:

None

RELATION OF COURSE TO PROGRAM:

Elective

COURSE INSTRUCTION OUTCOMES:

The student is able to promote the scientific approach to solve management problems, and build up capability to construct mathematical models of practical problems and solve them. The student is also introduced to the role of computer technology in solving problem of operations research

TOPICS COVERED:

- 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.

CONTRIBUTION OF COURSE TO MEET THE REQUIREMENTS OF CRITERION 5:

Professional Component Content			
Math and Basic Sciences	Engineering Topics	General Education	Engineering Design
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RELATIONSHIP OF COURSE TO STUDENT OUTCOMES:

Student Outcomes		Course Outcomes
a.	An ability to apply knowledge of mathematics, science, and engineering.	✓
b.	An ability to design and conduct experiments, analyze and interpret data.	
c.	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	
d.	An ability to function on multi-disciplinary teams.	
e.	An ability to identify, formulate, and solve engineering problems.	
f.	An understanding of professional and ethical responsibility.	
g.	An ability to communicate effectively.	
h.	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
i.	A recognition of the need for, and an ability to engage in life-long learning.	
j.	A knowledge of contemporary issues within and outside the electrical engineering profession.	✓
k.	An ability to use the techniques, skills, and modern engineering tools necessary for electrical engineering practice.	