



Project No.
29018

Date
2025

Doc. No.
EOTSS29018

Serial No
29018/2025

Rev.
00

Proj. dep.
AUX

EOTSS Doc. CODE :

EOTSS/AUX.S/29018-AUX/2025



المكتب الهندسي لخدمات التكنولوجيا والبرمجيات

Engineering office for Technology and Software Services

Operations Research



Course Title: Operations Research
Code: 29018-AUX

***Introduction:

Operations Research (OR)** is the discipline of applying advanced analytical methods to help make better decisions. It blends mathematics, statistics, and computer science to optimize complex systems.

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, El Siouf _Alexandria

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الفرع الرئيسي: عمارات المتحدة – عمارة عين شمس – امام البنك
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🌟 Course Description:

This course covers the core techniques of Operations Research, from linear and nonlinear programming to queuing theory and network analysis. Participants will learn optimization strategies, modeling techniques, and applications across industries like manufacturing, logistics, and project management.

🎯 Target Audience:

- Engineering and Business Management students.
- Decision-makers and Analysts.
- Professionals in Logistics, Operations, and Project Management.

📚 What You Will Learn:

- Formulate and solve linear programming models using the Simplex Method.
- Perform sensitivity analysis to understand model robustness.
- Tackle nonlinear optimization problems with practical methods.
- Model and analyze waiting lines using Queuing Theory.
- Solve network problems like shortest paths and project scheduling (PERT/CPM).

👨‍🏫 Instruction Methodology:

- 📖 Concept-based Lectures and Mathematical Derivations.
- 📊 Practical Problem-Solving Sessions.
- 🔍 Real-world Case Studies.
- 🛠️ Software Tools (e.g., MATLAB, Excel Solver).

🌱 Main Modules:

📦 Linear Programming

- ➡ Simplex Method
- ➡ Sensitivity Analysis

📦 Nonlinear Programming

- 📈 Optimization Methods
- 📈 Practical Applications

📦 Queuing Theory

- ⌚ Waiting Line Models

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- ⌚ Operations Management Applications

🔌 Network Analysis

- 📖 Shortest Path Problems
- 📖 Project Scheduling (PERT/CPM)



Materials Included:

- 📄 Comprehensive Lecture Notes (PDFs)
- 📊 Practical Worksheets and Problem Sets
- 🖨️ Software Tutorials (Excel Solver, MATLAB examples)
- 🎥 Recorded Lectures and Case Studies



Course Duration:

- **8 weeks** — *Two lectures per week.*



Level:

- **Intermediate to Advanced** (Recommended background: basic linear algebra and probability theory).

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