

## Content

| Course Code | Course Name          | Semester | Theory | Practice | Lab | Credit | ECTS |
|-------------|----------------------|----------|--------|----------|-----|--------|------|
| G261        | Operational Research | 3        | 3      | 0        | 0   | 3      | 5    |

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|------------------------|--|
| Prerequisites          |  |
| Admission Requirements |  |

|                         |  |
|-------------------------|--|
| Language of Instruction | Turkish  |
| Course Type             | Compulsory   |
| Course Level            | Bachelor Degree  |
| Objective               | <p>Operations research aims to apply scientific approaches in order to design and manage systems with scarce resources. This course, which is compulsory in the curriculum, enables students to provide the optimal solution to the problems encountered in an organization. The material will prove useful for improving and optimizing the performance of an organization. In this context, the aims of this course are as follows:</p> <ul style="list-style-type: none"><li>• Formulating mathematical models for real world problems.</li><li>• Introducing the solution methods for mathematical programming models.</li><li>• Examining the validity of the models and interpreting the obtained results.</li></ul> |
| Content                 | <p>Introduction to linear programming and graphical solution method, Example problems for linear programming, Simplex method, Two-phase simplex method, Special cases for simplex method, Sensitivity analysis, Assignment problem and Hungarian algorithm, Transportation problem and transportation simplex algorithm</p>  |
| References              | <ol style="list-style-type: none"><li>1. Hillier, F.S., Lieberman, G.J., "Introduction to Mathematical Programming", McGraw-Hill, 1995.</li><li>2. Bazaraa, M.S., Jarvis, J.J., Sherali, H.D., "Linear Programming and Network Flows", John Wiley &amp; Sons, 1990.</li><li>3. Taha, H.A., "Operations Research: An Introduction", Sixth edition, Prentice-Hall, 1997.</li></ol>   |

## Theory Topics

| Week | Weekly Contents  |
|------|--|
| 1    | Introduction to linear programming and graphical solution method |
| 2    | Example problems for linear programming                          |
| 3    | Example problems for linear programming                          |
| 4    | Simplex method   |
| 5    | Simplex method   |
| 6    | Two-phase simplex method   |
| 7    | Special cases for simplex method                                 |
| 8    | Special cases for simplex method                                 |
| 9    | Midterm  |
| 10   | Sensitivity analysis   |
| 11   | Sensitivity analysis   |
| 12   | Assignment problem and Hungarian algorithm                       |
| 13   | Transportation problem and transportation simplex algorithm      |
| 14   | Transportation problem and transportation simplex algorithm      |