

## Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
IND471	Operations Research	8	2	2	0	3	4

Prerequisites	ING207
Admission Requirements	ING207

Language of Instruction	French
Course Type	Elective
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	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
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	Operations Research: definition and history
2	Decision Making and Modelling
3	Linear Programming
4	Linear Programming and Graphical Method
5	Programming Model Examples
6	Simplex Method
7	Simplex Method
8	Midterm Exam
9	Problems in Linear Programming and Simplex Method
10	Duality
11	Revised Simplex
12	Sensitivity Analyzes
13	Transportation Models
14	Network Analysis