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	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: • Formulating mathematical models for real world problems. • Introducing the solution methods for mathematical programming models. • Examining the validity of the models and interpreting the obtained results.
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	1. Hillier, F.S., Lieberman, G.J., “Introduction to Mathematical Programming”, McGraw-Hill, 1995. 2. Bazaraa, M.S., Jarvis, J.J., Sherali, H.D., “Linear Programming and Network Flows”, John Wiley & Sons, 1990. 3. Taha, H.A., “Operations Research: An Introduction”, Sixth edition, Prentice-Hall, 1997.

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