Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
EM 512	Mathematical Programming	1	4	0	0	3	8

Prerequisites	
Admission Requirements	

Language of Instruction	English
Course Type	Compulsory
Course Level	Masters Degree
Objective	The objective of the course is to familiarize the student with mathematical modeling and the basic tools of mathematical programming to the extent they can be applied in operational situations. The material is quite practical and will prove useful in personal decision making as well as in many types of engineering and management decisions.
Content	- Introduction and organization - Overview of modeling - Introduction to linear programming - Graphical solution - Linear programming model - Assumptions of linear programming - Additional modeling examples - The simplex method - Standard form of linear programming - Unrestricted variables - Simplex method in tabular form - Artificial starting solution - The big M method - The two-phase method - Special cases in simplex method application - Degeneracy - Unbounded solutions - Multiple optimal solutions - Infeasible solution - Post-optimality analysis - Presentation of LINDO software - Duality - Definition of the dual problem - Primal-dual relationships - Dual simplex method - Sensitivity analysis - The transportation problem - The assignment problem - Introduction to network models - Terminology of networks - The minimum spanning tree problem - Goal programming - Deterministic dynamic programming - Characteristics of dynamic programming problems - Principle of optimality - Selected dynamic programming applications
References	- Hillier, F.S., Lieberman, G.J., Introduction to Mathematical Programming, McGraw-Hill, 1995. - Taha, H.A., Operations Research: An Introduction, Sixth edition, Prentice-Hall, 1997.

Theory Topics

Week	Weekly Contents