Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
MAT416	Applied Mathematics	8	3	0	0	4	5

Prerequisites	
Admission Requirements	

Language of Instruction	French
Course Type	Elective
Course Level	Bachelor Degree
Objective	The objective of this course is to study the basics of 3 important subjects of Applied mathemetics: Fixed Point Theory, Approximation Theory and Optimisation Theory with their applications in Data science, Physics and Economics
Content	(1) Banach Fixed Point Theory and its applications: Newton's Method, Cobweb Thm, Picard Thm, Gauss-Seidel Iteration, Fredholm-Volterra Thm. Applications in economics (2) Approximation Theory. Uniform and approximation in the sense of . Convexity, Haar's condition. Applications. (3) Optimisation Theory basics with numerical viewpoint by usual algorithmes
References	Introductory Functional Analysis with Applications, E. Kreyszig, Wiley An Introduction to Real Analysis, T. Terzioğlu, ODTÜ Fonksiyonel Analizin Yöntemleri, T. Terzioğlu, Matematik Vakfı Fonksiyonel Analiz, E. Şuhubi, İTÜ Vakfı Bir Analizcinin Defeterinden Seçtikleri, T.Terzioğlu, Nesin Matematik Köyü Real Analysis with Economic Applications, Efe A. Ök, Princeton University Press Numerical Optimization , J. Nocedal & S. J. Wright, Springer , 1999. ve 2. basım: Introduction to Global Optimization , R. Horst , P. M.Pardolas &N. V. Thoai , Kluwer Academic Publishers , The Princeton Companion to Applied Mathematics , Edited by Nicholas J. Higham , Princeton University Press , 2015 https://nhigham.com/2016/03/29/the top 10 algorithms in applied mathematics A gentle introduction to optimization / B. Guenin , J. Könemann , L. Tunçel Cambridge University Press

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