

## 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 mathematics: 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						
Content	(2) Approximation Theory. Uniform and approximation in the sense of . Convexity, Haar's condition. Applications.						
Content	(3) Optimisation Theory basics with numerical viewpoint by usual algorithms						
References	Introductory Functional Analysis with Applications, E. Kreyszig, Wiley						
References	An Introduction to Real Analysis, T. Terzioğlu, ODTÜ						
References	Fonksiyonel Analizin Yöntemleri, T. Terzioğlu, Matematik Vakfi						
References	Fonksiyonel Analiz, E. Şuhubi, İTÜ Vakfi						
References	Bir Analizcinin Defeterinden Seçtikleri, T. Terzioğlu, Nesin Matematik Köyü						
References	Real Analysis with Economic Applications, Efe A. Ök, Princeton University Press						
References	Numerical Optimization , J. Nocedal & S. J. Wright, Springer , 1999. ve 2. basım:						
References	Introduction to Global Optimization , R. Horst , P. M.Pardolas &N. V. Thoai , Kluwer Academic Publishers ,						
References	The Princeton Companion to Applied Mathematics , Edited by Nicholas J. Higham , Princeton University Press , 2015						
References	<a href="https://nhigham.com/2016/03/29/the-top-10-algorithms-in-applied-mathematics">https://nhigham.com/2016/03/29/the-top-10-algorithms-in-applied-mathematics</a>						
References	A gentle introduction to optimization / B. Guenin , J. Könemann , L. Tunçel Cambridge University Press						

## Theory Topics

Week	Weekly Contents
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8	Examen Partiel
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