Content

| Course Code | Course Name | Semester | Theory | Practice | Lab | Credit | ECTS |
|-------------|---------------------|----------|--------|----------|-----|--------|------|
| MAT416 | Applied Mathematics | 8 | 4 | 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 Fixed Point Theory and Approximation Thoery with their applications in Numerical Anlaysis, Physcs 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. |
| 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 |

Theory Topics

| Week | Weekly Contents |
|------|----------------------------------|
| 1 | Riemann integral |
| 2 | Riemann integral |
| 3 | Algebra of sets |
| 4 | Sigma algebra of sets |
| 5 | Mesure and extension of a mesure |
| 6 | Lebesgue mesure |
| 7 | Examination |
| 8 | Lebesgue mesure |
| 9 | Lebesgue integral |
| 10 | Lebesgue integral |
| 11 | Main integration theorems |
| 12 | Main integration theorems |
| 13 | Main integration theorems |
| 14 | Main integration theorems |