**Code and Name:**

**MAT5720 Orlicz Spaces**

**Unit:**

Institute of Science, Department of Mathematics

**Details:**

* **Term:** 2023-2024 Spring
* **Status:** Elective
* **Class Level:** 1
* **Credit Hours:** 3-0-0-3
* **ECTS:** 6
* **Language:** Turkish

**Course Instructors:**

* **Course Coordinator:** ...
* **Assistant Instructor:** ...
  + **Phone:** ...
  + **Email:** ...@firat.edu.tr
  + **Social Accounts:** ...

**Weekly Schedule**

| **Monday** | **Tuesday** | **Wednesday** | **Thursday** | **Friday** | **Saturday** |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |

**Teaching Method:**  
Each weekly hour will include at least 45 minutes of face-to-face teaching.

**Location:**

* **In-person (YY):** Classroom (To be announced)
* **Remote (UE):** -

**Objective:**

To provide a detailed understanding of theorems and definitions in Orlicz spaces.

**Materials:**

1. M.M. Rao, Z.D. Ren, *Applications of Orlicz Spaces*, New York, 2002
2. M.A. Krasnosel'ski, Ya. B. Rutickii, *Convex Functions and Orlicz Spaces*, Noordhoff, 1961

**Student Responsibilities:**

Students are required to attend at least 70% of the classes.

**Weekly Lesson Plan:**

| **Week** | **Topic** | **Methodology** |
| --- | --- | --- |
| 1 | Introduction to the course and key concepts | Face-to-Face |
| 2 | Completeness in Orlicz spaces | Face-to-Face |
| 3 | Norms of characteristic functions in Orlicz spaces | Face-to-Face |
| 4 | Hölder inequality and its properties | Face-to-Face |
| 5 | Convergence in the mean and its properties | Face-to-Face |
| 6 | Separability and sufficient conditions in Orlicz spaces | Face-to-Face |
| 7 | Continuity of norms in Orlicz spaces | Face-to-Face |
| 8 | Compactness criteria in Orlicz spaces | Face-to-Face |
| 9 | **Midterm Exam** | Face-to-Face |
| 10 | Kolmogorov compactness criterion in Orlicz spaces | Face-to-Face |
| 11 | Comparison of Orlicz spaces | Face-to-Face |
| 12 | Inequalities for norms in Orlicz spaces | Face-to-Face |
| 13 | Approximation in Orlicz spaces | Face-to-Face |
| 14 | Direct and inverse theorems, weighted Orlicz spaces, and bases in Orlicz spaces | Face-to-Face |

**Assessment and Evaluation:**

| **Method** | **Quantity** | **Weight** |
| --- | --- | --- |
| **Midterm Exam** | 1 | 50% |
| **Quizzes** | None | - |
| **Assignments** | Pre- and post-midterm activities | - |
| **Projects** | None | - |
| **Final Exam** | 1 | 50% |

**Learning Outcomes:**

1. Understand the concepts of completeness and norm in Orlicz spaces.
2. Learn Hölder inequality and convergence in the mean in Orlicz spaces.
3. Grasp separability and compactness criteria in Orlicz spaces.
4. Compare different Orlicz spaces.
5. Understand the concept of approximation in Orlicz spaces.

**Special Notes:**

* **UE:** Remote Education
* **YY:** Face-to-Face Education