**Code and Name:**

**MAT5750 Positive Operators**

**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 students with the foundational knowledge needed to understand positive operators, one of the key operators in mathematics, and their relationships with Riesz spaces and other operators.

**Materials:**

* Charalambos D. Aliprantis, Owen Burkinshaw, *Positive Operators*

**Student Responsibilities:**

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

**Weekly Lesson Plan:**

| **Week** | **Topic** | **Methodology** |
| --- | --- | --- |
| 1 | Positive operators: Definitions, order structures, extensions, components | Face-to-Face |
| 2 | Projections: Ordered projections, ordered operators, sequentially continuous operators | Face-to-Face |
| 3 | Positive functionals: Positive linear functionals and their properties | Face-to-Face |
| 4 | **Riesz Spaces**: Definitions, properties, and theorems | Face-to-Face |
| 5 | Convex solid and partially convex solid Riesz spaces: Theorems and examples | Face-to-Face |
| 6 | Weak compactness in Banach lattices | Face-to-Face |
| 7 | Embedding of Banach spaces and related theorems | Face-to-Face |
| 8 | Banach lattice operators and related theorems | Face-to-Face |
| 9 | **Midterm Exam** | Face-to-Face |
| 10 | Homomorphisms: Lattice homomorphisms, automorphisms, and their properties | Face-to-Face |
| 11 | Weak topologies: Definitions and properties | Face-to-Face |
| 12 | Weak topologies on Banach spaces | Face-to-Face |
| 13 | Compact operators: Weakly compact operators | Face-to-Face |
| 14 | L and M weakly compact operators | 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 ordering in positive operators and their extensions.
2. Learn ordered projections and sequentially continuous operators.
3. Understand positive linear functionals and components of a positive operator.
4. Learn lattice homomorphisms and automorphisms.
5. Understand weak topologies on Banach spaces.

**Special Notes:**

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