**Code and Name:**

**MAT5260 Transformations in High-Dimensional 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 explain transformations and their geometries in n-dimensional spaces.

**Materials:**

1. B. Karol, *Multidimensional Analytic Geometry*, 1969
2. H.H. Hacısalihoğlu, *Transformations and Geometry in High-Dimensional Spaces*, 1980

**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 | **Affine Spaces and Transformations**: Definitions and examples | Face-to-Face |
| 3 | **Isometries in Euclidean Space**: Definitions and basic concepts | Face-to-Face |
| 4 | **Movements**: Definition and properties | Face-to-Face |
| 5 | **Subgroups of R(n)R(n)R(n)**: Direct movements, rotations, translations, and reflections | Face-to-Face |
| 6 | **General Movements**: Compositions of translations and rotations | Face-to-Face |
| 7 | **Equivalent Isometries**: Properties and examples | Face-to-Face |
| 8 | Applications and problem-solving related to discussed topics | Face-to-Face |
| 9 | **Midterm Exam** | Face-to-Face |
| 10 | **Classification of Isometries**: Equivalent and planar isometries | Face-to-Face |
| 11 | **Examples of Isometries**: Translations, direct rotations, reflections, glide reflections | Face-to-Face |
| 12 | **Opposite Movements**: Examples and applications | Face-to-Face |
| 13 | **Classification of Planar Isometries**: Equivalency and theorems | Face-to-Face |
| 14 | **Planar Isometries in n-Dimensional Euclidean Spaces**: Definitions and theorems | 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 affine transformations.
2. Define isometries.
3. Comprehend movements and their groups.
4. Classify isometries.
5. Learn classifications of planar isometries.

**Special Notes:**

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