**Code and Name:**

**MAT5370 Affine Submanifolds**

**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 teach the fundamental concepts of affine geometry, including connection and metric concepts, to understand affine immersions, and to present some important theorems and formulas in affine geometry.

**Materials:**

1. Katsumi Nomizu & Takeshi Sasaki, *Affine Differential Geometry*, Cambridge University Press, 1994
2. W. Blaschke, *Lectures on Differential Geometry II: Affine Differential Geometry*, Springer, Berlin, 1923
3. H. Hopf, *Differential Geometry in the Large*, Lecture Notes in Mathematics, Springer, 1983
4. B. Su, *Affine Differential Geometry*, Science Press, Beijing, 1983; Gordon and Breach, New York, 1983

**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 Geometry**: Plane curves | Face-to-Face |
| 3 | **Affine Geometry**: Affine space | Face-to-Face |
| 4 | **Affine Connections**: Definitions and properties | Face-to-Face |
| 5 | **Affine Connections**: Metric concept | Face-to-Face |
| 6 | **Affine Connections**: Vector bundles | Face-to-Face |
| 7 | **Geometry of Affine Immersions**: Definitions and properties | Face-to-Face |
| 8 | **Geometry of Affine Immersions**: Fundamental equations for immersions | Face-to-Face |
| 9 | **Midterm Exam** | Face-to-Face |
| 10 | **Geometry of Affine Immersions**: Blaschke immersions, cubic forms | Face-to-Face |
| 11 | **Geometry of Affine Immersions**: Transformations in dual affine space | Face-to-Face |
| 12 | **Geometry of Affine Immersions**: Laplacian for affine metric | Face-to-Face |
| 13 | **Geometry of Affine Immersions**: Lelieuvre formula in affine differential geometry | Face-to-Face |
| 14 | **Geometry of Affine Immersions**: Fundamental theorem and formulas in affine differential geometry | 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. Gain fundamental knowledge of affine geometry.
2. Learn concepts like connection and metric.
3. Understand important theorems in affine geometry.
4. Acquire knowledge about key formulas in affine geometry.
5. Develop basic skills to perform calculations in differential geometry.

**Special Notes:**

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