**Code and Name:**

**MAT6040 Biomathematics**

**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 students how fundamental mathematical concepts can be used to mathematically model biological systems.

**Materials:**

1. S. Andersson, K. Larsson, M. Larsson, *Biomathematics: Mathematics of Biostructures and Biodynamics*
2. D.S. Jones, Michael Plank, B.D. Sleeman, *Differential Equations and Mathematical Biology*

**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 | **Mathematical Models**: Purpose and introduction to metrology | Face-to-Face |
| 3 | **Metrological Units**: Definitions and conversions | Face-to-Face |
| 4 | **Single-Variable Functions**: Applications in biological systems | Face-to-Face |
| 5 | Derivatives of single-variable functions | Face-to-Face |
| 6 | Examples and applications of derivatives in biological systems | Face-to-Face |
| 7 | Extremum points and graphing | Face-to-Face |
| 8 | Analysis of graphs obtained from biological systems | Face-to-Face |
| 9 | **Midterm Exam** | Face-to-Face |
| 10 | **Indefinite Integral**: Properties and examples | Face-to-Face |
| 11 | Biochemical reaction systems: Characteristics | Face-to-Face |
| 12 | Modeling biochemical reaction systems | Face-to-Face |
| 13 | **Derivative and Integral Relationship**: Rules and applications | Face-to-Face |
| 14 | Applications of derivatives and integrals in biological systems | 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. Learn mathematical models, metrological units, and single-variable functions.
2. Understand derivatives of single-variable functions and their applications in biological systems.
3. Learn extremum points and graphing biological data.
4. Understand indefinite integrals and biochemical reaction systems.
5. Apply derivatives and integrals to biological systems.

**Special Notes:**

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