### Course code - name: MATH 511 – Advanced Engineering Mathematics I

**Department:** Computer Engineering

<table>
<thead>
<tr>
<th>Semester</th>
<th>Methods of Education</th>
<th>Credit (ECTS)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lecture</td>
<td>Recitation/ (Etud)</td>
</tr>
<tr>
<td>1</td>
<td>42</td>
<td>48</td>
</tr>
</tbody>
</table>

**Language:** English

**Compulsory/Elective:** Elective

**Prerequisites:** None

**Course Contents:**

**Course Objectives:**
To have students learn some solutions methods of some families of differential equations, some well-known special types of equations. To have students learn some applications of basic linear algebra and some special types of series.

**Learning Outcomes and Competences:**
1. Students who can solve any types of ordinary differential equations.
2. Students who learned main applications of basic linear algebra.
3. Students who learned to solve some special types of systems of equations.

**Textbook and/or References:**

**Assessment Criteria:**

- If any, mark as (X) Percentage (%)
- Midterm Exams X 30
- Quizzes
- Homeworks X 20
- Projects
- Term Paper
- Laboratory work
- Other
- Final Exam X 50

**Instructors:** Doç. Dr. Fatih Koyuncu

**Week** | **Subject**
---|---
1 | Ordinary differential equations of the first order
2 | Linear differential equations
3 | Complex numbers
4 | The algebra of matrices
5 | Determinants, Systems of linear algebraic equations
6 | Special linear systems, inverses, adjoints, Cramer’s rule
7 | Characteristic-Value problems
8 | Simultaneous linear differential equations
9 | Numerical methods
10 | The descriptive theory of ordinary differential equations
11 | Mechanical systems and electric circuits
12 | Fourier series
13 | Fourier integrals and Fourier transforms
14 | The Laplace transformation