	Course name: MATH 421 Applied Mathematics I			**Department:** Mathematics			Semester **7**
	Methods of Education						Credit (ECTS) **6**
	Lecture	Recitation/ (Etud)	Lab	Exams	Homework/ Quiz	Other	Total
	42	0	0	42	40	56	180
Language	English						
Compulsory/Elective	Departmental Elective						
Prerequisites	None						

Course Contents

Weeks	Subjects
1	Force fields
2	Force fields
3	Work done by a force field
4	Work done by a force field
5	Work done by a force field
6	Calculation of mass, centre of gravity and moment of inertia of higher order integrals
7	Calculation of mass, centre of gravity and moment of inertia for multiple integrals
8	Guldin theorems
9	Piecewise continuous functions
10	Even and odd functions, periodic functions
11	Orthogonal and orthonormal function systems
12	Fourier series
13	Fourier series expansions of aforementioned functions above
14	Leibnitz rule and Gamma and Beta functions

Course Objectives

This lecture deals with work problems, mass, centre of mass, moment of inertia and Fourier series that are frequently used in mathematics, physics and engineering.

Learning Outcomes and Competences

By the end of this course, a student will be able to:

1. learn the concept of force field and calculates the work done in this field
2. explain the concept of the protected area and potential function
3. calculates the mass, centre of gravity and moments of inertia and proves Guldin theorems.
4. appreciate the significance of piecewise continuous function, even and odd functions, periodic function, orthogonal and orthonormal systems
5. obtain the expansions of Fourier series
6. express the functions defined by the help of integral and Leibnitz rule

Textbook and /or References

- 2012, Peter V. O'Neil, Advanced Engineering Mathematics, Cengage Learning, USA. 7th Edition, Part 4, Chapters 13-15
- 2018, James P. Keener, Principles of applied mathematics: Transformation an Approximation , CRC Press, Taylor&Francis Group, Boca Raton, FL.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage%
Mid-terms	1	30
Quizes	0	0
Assignments	4	20
Attendance	0	0

	Practice		0	0
	Project		0	0
	Final Examination		1	50
	Total		**6**	**100**
ECTS Allocated Based on Student Workload	**Activities**	**Quantity**	**Duration**	**Total Work Load**
	Course Duration	14	3	42
	Hours for off-the-c.r.study	14	4	56
	Assignments	4	10	40
	Mid-terms	1	14	14
	Project	0	0	0
	Final Examination	1	28	28
	Total	**34**	**59**	**180**
Instructors				