DEPARTMENT OF ENERGY SCIENCE AND TECHNOLOGY
COURSE SYLLABUS

Course Details				
Code	**Academic Year**			**Semester**
MAT112	1			Fall
Title	**T**	**A**	**L**	**ECTS**
Analysis 2 and Linear Algebra	3	2	0	6

Language	German					
Level	**Undergraduate**	**X**	**Graduate**		**Postgraduate**	
Department / Program	Energy Science and Technology					
Forms of Teaching and Learning	Face-to-face					
Course Type	**Compulsory**	**X**	**Elective**			
Objectives	The goal is to apply integral calculus and matrix algebra methods in various fields of science.					
Content	Topics include integral calculus, infinite series, complex numbers, and matrix algebra.					
Prerequisites	None					
Coordinator	Assist. Prof. Dr. Neşe Aral					
Lecturer(s)	Assist. Prof. Dr. Neşe Aral					
Assistant(s)	None					
Work Placement	None					

Recommended or Required Reading	
Books / Lecture Notes	Papula Lothar, Mathematik für Ingenieure und Naturwissenschaftler, Band 1+2
Other Sources	-

Additional Course Material	
Documents	Lecture notes
Assignments	-
Exams	1 Midterm, 1 Final Exam

Course Composition		
Mathematics und Basic Sciences	100	%
Engineering		%
Engineering Design		%
Social Sciences		%
Educational Sciences		%
Natural Sciences		%

DEPARTMENT OF ENERGY SCIENCE AND TECHNOLOGY
COURSE SYLLABUS

Health Sciences		%
Expert Knowledge		%

Assessment

Activity	Count	Percentage (%)
Midterm Exam	1	40
Quiz	-	
Assignments	-	
Attendance	-	
Recitations	-	
Projects	-	
Final Exam	1	60
	Total	**100**

ECTS Points and Work Load

Activity	Count	Duration	Work Load (Hours)
Lectures	15	5	75
Self-Study	28	2	56
Assignments			
Presentation / Seminar Preparation			
Midterm Exam	1	2	2
Recitations	11	3	33
Laboratory			
Projects			
Final Exam	1	2	2
		Total Work Load	**168**
		ECTS Points (Total Work Load / Hour)	**6**

Learning Outcomes

1	To be able to apply integral calculus and matrix algebra methods in various fields of science.

Weekly Content

1	Area calculation
2	Volume calculation
3	Arc length calculation
4	Surface area calculation of rotational bodies
5	Centroid calculation
6	Applications of integral calculus in biology
7	Infinite series, Taylor expansion

DEPARTMENT OF ENERGY SCIENCE AND TECHNOLOGY
COURSE SYLLABUS

8	Midterm Exam
9	Complex numbers and functions, Vectors and real matrices
10	Vector spaces
11	Determinants
12	Inverse and orthogonal matrices
13	Linear equation systems
14	Complex matrices
15	Eigenvalues and eigenvectors
16	Final Exam

Contribution of Learning Outcomes to Program Objectives (1-5)

	P1	P2	P3	P4	P5	P6	P7	P8	P9
Ö1	5	4	5	4	5	5	4	5	5

Contribution Level 1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High

Compiled by:	Res Asst. Kevser Celep
Date of Compilation:	27.01.2025