

TOROS ÜNİVERSİTESİ

Faculty Of Engineering
Electrical And Electronics Engineering (English)

Course Information

COMPLEX CALCULUS					
Code	Semester	Theoretical	Practice	National Credit	ECTS Credit
		Hour / Week			
MAT205	Fall	3	0	3	5

Prerequisites and co-requisites	
Language of instruction	English
Type	Required
Level of Course	Bachelor's
Lecturer	Asst. Prof. Çağdaş ALLAHVERDİ
Mode of Delivery	Face to Face
Suggested Subject	
Professional practise (internship)	None
Objectives of the Course	Prepare students to be able to learn, understand, explain and use complex operation and thus help their engineering studies.
Contents of the Course	Definition of complex numbers, Fundamental operations including complex numbers (Four basic operations, roots etc.), Use complex numbers in AC circuits (Phasor algebra), Complex derivatives and complex limits, Complex integrals, Fourier transformations, Conformal mapping.

Learning Outcomes of Course

#	Learning Outcomes
1	Ability to apply mathematics, science and engineering knowledge and experience to real world problems.
2	Ability to design and execute experiments and analyze the results.
3	Ability to identify engineering problems and suggest solutions.
4	Ability to communicate, express himself freely and develop new ideas.

Course Syllabus

#	Subjects	Teaching Methods and Technics
1	Definition of complex numbers and terminology in complex analysis	Lecture
2	Fundamental operations with complex numbers	Lecture
3	Complex derivatives	Lecture
4	Complex limits	Lecture
5	Complex integrals and their classification	Lecture
6	Cauchy theorem and its applications	Lecture
7	Solving complex integrals using Residue theorems	Lecture
8	Midterm Exam	
9	Fourier transformations	Lecture
10	Solving Fourier integrals using Residue theorems	Lecture
11	Complex series	Lecture
12	Definition of conformal mapping	Lecture

13	Electrostatic applications of conformal mapping	Lecture
14	Other applications of conformal mapping	Lecture
15	Review	
16	Final Exam	

Course Syllabus

#	Material / Resources	Information About Resources	Reference / Recommended Resources
1	Murray Spiegel, Seymour Lipschutz, John Schiller, Dennis Speilman, Complex Variables, 2nd Edition, Schaum's Outlines, ISBN-13: 978-0071615693.		

Method of Assessment

#	Weight	Work Type	Work Title
1	40%	Mid-Term Exam	Mid-Term Exam
2	60%	Final Exam	Final Exam

Relationship between Learning Outcomes of Course and Program Outcomes

#	Learning Outcomes	Program Outcomes	Method of Assessment
1	Ability to apply mathematics, science and engineering knowledge and experience to real world problems.	1	1,2
2	Ability to design and execute experiments and analyze the results.	1	1,2
3	Ability to identify engineering problems and suggest solutions.	1	1,2
4	Ability to communicate, express himself freely and develop new ideas.	1	1,2

PS. The numbers, which are shown in the column Method of Assessment, presents the methods shown in the previous table, titled as Method of Assessment.

Work Load Details

#	Type of Work	Quantity	Time (Hour)	Work Load
1	Course Duration	14	3	42
2	Course Duration Except Class (Preliminary Study, Enhancement)	14	3	42
3	Presentation and Seminar Preparation	0	0	0
4	Web Research, Library and Archival Work	0	0	0
5	Document/Information Listing	0	0	0
6	Workshop	0	0	0
7	Preparation for Midterm Exam	1	6	6
8	Midterm Exam	1	1	1
9	Quiz	0	0	0
10	Homework	0	0	0
11	Midterm Project	0	0	0
12	Midterm Exercise	0	0	0
13	Final Project	0	0	0
14	Final Exercise	0	0	0
15	Preparation for Final Exam	1	12	12
16	Final Exam	1	1	1

