



**ESOGU ELECTRICAL-ELECTRONICS ENGINEERING DEPARTMENT
COURSE INFORMATION FORM**

Course Title	Course Code
CALCULUS II	151222201

Semester in Program	Number of Course Hours per Week		ECTS Credit
	Theory	Practice	
2	4	0	5

Course ECTS Credit Distribution				
Basic Sciences	Engineering Sciences	Design	General Education	Social
5	0	0	0	0

Language of Instruction	Course Level	Course Type
English	Undergraduate	Required

Prerequisite	-
Objectives of the Course	Teaching students the basic concepts, theorems of multivariable calculus and vector analysis and provide them the ability to solve related mathematical problems.
Brief Course Content	Series and sequences. Polar coordinates. Coordinate systems. Vectors. Partial derivatives. Multiple integrals. Vector differential operators. Integration of vector fields.

Learning Outcomes of the Course	Contributed POs	Teaching Methods *	Assessment Methods **
1 Understanding series and sequences	1a	1, 10	A, B
2 Defining various coordinate systems	1a	1, 10	A, B
3 Applying basic operations on vectors and vector fields.	1a	1, 10	A, B
4 Defining partial derivative and directional derivative.	1a	1, 10	A, B
5 Applying partial derivative to certain problems.	1a	1, 10	A, B
6 Defining multiple integrals.	1a	1, 10	A, B
7 Applying multiple integrals to certain problems.	1a	1, 10	A, B
8 Defining divergence and curl operators.	1a	1, 10	A, B
9 Applying line and surface integration on vector fields.	1a	1, 10	A, B

*Teaching Methods 1:Lecture, 2:Discussion, 3:Experiment, 4:Simulation, 5:Question-Answer, 6:Tutorial, 7:Observation, 8:Case Study, 9:Technical Visit, 10:Problem Solving, 11:Individual Work, 12:Team/Group Work, 13:Brain Storm, 14:Project Design / Management, 15:Report Preparation and/or Presentation

**Assessment Methods A:Exam, B:Quiz, C:Oral Exam, D:Homework, E:Report, F:Article Examination, G:Presentation, I:Experimental Skill, J:Project Observation, K:Class Attendance; L:Jury Exam

Main Textbook	J. R. Hass, C. E. Heil, M. D. Weir, P. Bogacki, Thomas' Calculus, Pearson, 15th ed., 2023.
Supplementary Resources	- J. Stewart, D. K. Clegg, S. Watson, Calculus, Cengage Learning; 9th ed, 2020. - Ahmet A. Karadeniz, Yüksek Matematik Cilt: 2, Çağlayan Kitabevi, 2007. - Ahmet A. Karadeniz, Yüksek Matematik Cilt: 3, Çağlayan Kitabevi, 2004.
Necessary Course Material	-

Course Weekly Schedule	
1	Sequences and infinite series. Convergence. Comparison tests. Ratio and root tests.
2	Alternating series. Absolute convergence. Power series. Taylor and Maclaurin series.
3	Parametric equations. Polar coordinates. Graphing in polar coordinates. Areas and lengths in polar coordinates.
4	Three dimensional coordinate systems. Vectors. Basic operations on vectors.
5	Vectors and analytical geometry.
6	Limits and continuity of multivariable functions.
7	Partial derivatives. Chain rule.
8	Mid-Term Exams
9	Directional derivatives. Gradients.
10	Extreme values and saddle points.
11	Double integrals. Finding limits of integration. Areas by double integration. Double integrals in polar form.
12	Triple integrals. Finding limits of integration. Triple integrals in cylindrical and spherical coordinates.
13	Integration in vector fields. Line integrals. Fundamental theorem for line integrals.
14	Divergence and curl. Parametric surfaces. Surface integrals.
15	Stokes theorem. Divergence theorem.
16,17	Final Exams

Calculation of Course Workload			
Activities	Count	Time (Hour)	Total Workload (Hour)
Weekly classroom time	14	4	56
Weekly study time (review, reinforcing, preparation)	14	4	56
Homework	0	0	0
Taking a quiz	2	1	2
Studying for a quiz	2	5	10
Oral exam	0	0	0
Studying for an oral exam	0	0	0
Report writing (Preparation and presentation time included)	0	0	0
Project (Preparation and presentation time included)	0	0	0
Presentation (Preparation time included)	0	0	0
Mid-Term Exam	1	2	2
Studying for Mid-Term Exam	1	16	16
Final Exam	1	2	2
Studying for Final Exam	1	16	16
		Total workload	160
		Total workload / 30	5.3333
		Course ECTS Credit	5

Assessment	
Activity Type	%
Mid-term	35
Quiz	20
Final Exam	45
Total	100

COURSE CONTRIBUTION TO THE PROGRAM OUTCOMES (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)		
NO	PROGRAM OUTCOMES	Contribution
1	a. Sufficient knowledge of mathematics	5
	b. Sufficient knowledge of basic sciences	1
	c. Sufficient basic engineering and Electrical-Electronics engineering knowledge	1
	d. Skill of applying all these knowledge and experience to complicated Electrical-Electronics engineering problems	1
2	Skill of defining, identifying, formulating and solving the complicated problems in Electrical-Electronics engineering and related areas by applying appropriate analysis and modelling methods.	1
3	Skill of designing a complicated process, system, equipment or product by applying modern design methods under realistic constraints and conditions.	1
4	To analyze and solve the complicated engineering problems:	1
	a. skill of developing, selecting and applying the required techniques and devices	1
5	b. skill of using information technologies effectively	1
	To study the complicated on the complicated Electrical-Electronics engineering problems and research subjects:	1
6	a. skill of experimental design	1
	b. skill of performing the experiments, collecting the data and analyzing and interpreting the results	1
7	a. Skill of performing individual studies	1
	b. Skill of performing intra and interdisciplinary and multidisciplinary teamwork and studies	1
	c. Skill of effective oral and writing communication in Turkish and English	1
	d. Skill of improving and using foreign language knowledge	1
8	c. Skill of effective reporting, understanding the reports and preparing the design and production reports	1
	d. Skill of effective presentation and giving and getting clear and understandable instructions.	1
9	Awareness of the necessity of life-long learning and skill of accessing to information and following the improvements in contemporary science and technology	1
10	a. Awareness of necessity of behaving in accordance with the ethical principles and awareness of the importance of having professional ethical responsibilities	1
	b. Knowledge about legal regulations and standards of engineering	1
11	a. Knowledge about project management, risk management and change management	1
	b. Awareness of the significance of entrepreneurship and innovation	1
	c. Knowledge about sustainable development	1
12	Knowledge about the effects of engineering applications and practices on the global and social health, ecology and safety, knowledge about the current problems in relation to the working areas of Electrical-Electronics engineering; and awareness of the legal issues resulting from engineering solutions	1
12	Knowledge about modern problems in local and universal scale	1

INSTRUCTORS				
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Date: 06.07.2024