



HASAN KALYONCU UNIVERSITY
Faculty of Engineering
Course Description Form

COURSE: Calculus II					
CODE: MATH112		SEMESTER: SPRING			
LANGUAGE: ENGLISH		TYPE: COMPULSORY			
PRE-REQUISITES:- CO-REQUISITES:-		THEORY	PRACTICAL	CREDIT	ECTS
WEEKLY HOURS:		4	0	4	6

CONTENT OF THE COURSE:

Antiderivatives, Area and estimating with finite sums, limits of finite sums, the definite integral. Fundamental theorem of calculus, indefinite integrals and substitution. Area between curves. Volumes using cross-sections, volumes using cylindrical shells. Inverse functions and their derivatives, natural logarithms, exponential functions. L'Hospital Rule, Integration by parts, trigonometric integrals, Improper integrals, Sequences, Infinite series, the integral test, Comparison tests, The ratio and root tests. Alternating series, Power series. Taylor and Maclaurin series, Convergence of Taylor series.

OBJECTIVE OF THE COURSE:

To learn the concepts and methods of differential and integral calculus for functions of a real variable. To apply calculus to problems taken primarily from the physical and engineering sciences. The mathematical preparation for higher level mathematics and science courses. An understanding of the logical sequence of advanced mathematics.

WEEKLY SCHEDULE

Week	Topics
1	Antiderivatives, Area and estimating with finite sums, limits of finite sums, the definite integral
2	Fundamental theorem of calculus, indefinite integrals and substitution
3	Area between curves.
4	Volumes using cross-sections, volumes using cylindrical shells.
5	Inverse functions and their derivatives, natural logarithms, exponential functions.
6	L'Hospital Rule, Inverse trigonometric functions
7	Integration by parts, trigonometric integrals
8	MIDTERM
9	Trigonometric substitutions, integration of rational functions by partial fractions
10	Improper integrals, Sequences
11	Infinite series, the integral test
12	Comparison tests, The ratio and root tests
13	Alternating series, absolute and conditional convergence, Power series
14	Taylor and Maclaurin series, Convergence of Taylor series

TEXTBOOK:

Thomas, Weir, J. Hass, Thomas Calculus Early Transcendentals, 13'th Edition, Pearson, 2014, ISBN10 0321884078

REFERENCE BOOKS:

R. Smith and R.Minton, Calculus, ISBN 978-0-07- 338311-8.

EVALUATION SYSTEM:		
IN-TERM STUDIES	QUANTITY	PERCENTAGE (%)
Midterm Exam	1	45
Homework	0	0
Labworks	0	0
Quiz	0	0
Final Exam	1	55
TOTAL		
CONTRIBUTION OF INTERM STUDIES TO OVERALL GRADE	1	45
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE	1	55
TOTAL		100

COURSE CATEGORY:	PERCENTAGE (%)
Mathematics and Basic Sciences	%60
Engineering	%40
Engineering Design	%0
Social Sciences	%0

TABLE OF ECTS / WORKLOAD:			
Activities	QUANTITY	Duration (Hour)	Total Workload
Course Duration	13	4	52
Hours for off-the-classroom study (Pre-study, practice)	14	8	112
Mid-term	1	2	2
Final examination	1	2	2
Labworks	0	0	0
Quiz	0	0	0
Total Work Load			168
Total Work Load / 30			5,6
ECTS Credit of the Course			6

INSTRUCTOR(S):	Asst. Prof. Dr Ece Yetkin ÇELİKEL
FORM PREPARATION DATE:	25.11.2019

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
LO1	3	2	0	0	0	0	0	0	0	0	0
LO2	3	2	0	0	0	0	0	0	0	0	0
LO3	2	3	0	3	0	0	0	0	0	0	0
LO4	2	3	0	0	0	0	0	0	0	0	0
LO5	3	2	0	0	0	0	0	0	0	0	0
PO: Program Outcomes LO: Learning Outcomes Values: 0: None 1: Low 2: Medium 3: High											

LEARNING OUTCOMES OF THE COURSE:	PROGRAM OUTCOMES:
<p>LO1: A comprehension of mathematics (algebra, differential, integration ...) and fundamentals of science LO2: Ability to apply knowledge of mathematics, science and engineering to problems in electronics engineering.</p> <p>LO3: Ability to recognize the needs and challenges of our age and to assess the global and social impact of engineering solutions</p> <p>LO4: Ability to identify, formulate and solve engineering problems. LO5: Ability to effectively communicate knowledge and opinions via written, oral visual means.</p>	<p>PO1: Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied knowledge in these areas in complex engineering problems.</p> <p>PO2: Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.</p> <p>PO3: Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose.</p> <p>PO4: Ability to devise, select, and use modern techniques and tools needed for analyzing and solving complex problems encountered in engineering practice; ability to employ information technologies effectively.</p> <p>PO5: Ability to design and conduct experiments, gather data, analyze and interpret results for investigating complex engineering problems or discipline specific research questions.</p> <p>PO6: Ability to work efficiently in intra-disciplinary and multi-disciplinary teams; ability to work individually.</p> <p>PO7: Ability to communicate effectively in Turkish, both orally and in writing; knowledge of a minimum of one foreign language; ability to write effective reports and comprehend written reports, prepare design and production reports, make effective presentations, and give and receive clear and intelligible instructions.</p> <p>PO8: Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself.</p> <p>PO9: Consciousness to behave according to</p>

	<p>ethical principles and professional and ethical responsibility; knowledge on standards used in engineering practice.</p> <p>PO10: Knowledge about business life practices such as project management, risk management, and change management; awareness in entrepreneurship, innovation; knowledge about sustainable development.</p> <p>PO11: Knowledge about the global and social effects of engineering practices on health, environment, and safety, and contemporary issues of the century reflected into the field of engineering; awareness of the legal consequences of engineering solutions.</p>
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