Identification	**Subject**	MATH 105, Calculus 2A, 6 ECTS
	Department	Mathematics
	Program	Undergraduate
	Term	Fall, 2023
	Instructor	Vusal Osmanov
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	Phone:	(+994 70) 3333348
	Classroom/hours	Saturday: 11:50-13:20, Saturday: 13:40-15:10
Prerequisites	MATH 101- Calculus 1	
Language	English	
Compulsory/Elective	Required	
Required textbooks and course materials	***Core Textbooks:*** 1. George Thomas, et al, Thomas' Calculus: Early Transcendental, 12th edition, Addison-Wesley (2010), (http://libgen.org/) **Supplementary book** 2. James Stewart, Essential calculus. Early transcendentals, Second Edition,Brooks/Cole (2013) (http://libgen.org/)	
Course outline	In this subject we develop a method to calculate the areas and volumes of very general shapes. The integral is of fundamental importance in statistics, the sciences, and engineering. Here we will introduce three-dimensional coordinate systems and vectors, also. Vectors are used to study the analytic geometry of space, where they give simple ways to describe lines, planes, surfaces, and curves in space. We use these geometric ideas to study motion in space and the calculus of functions of several variables, with their many important applications in science, engineering, economics, and higher mathematics. The course concerns the study of integration methods, definite integrals and their applications to evaluation areas, volumes, arc length, areas of surfaces of revolution, *vectors*, three-dimensional Coordinate Systems, limits and continuity in higher dimensions, partial derivatives.	
Course objectives	The concepts of indefinite and definite integrals, vectors, three dimensional coordinate systems, limits and continuity in higher dimensions, partial derivatives. Application of definite integrals to area, volume and arc length and areas of surfaces of revolution problems.	
Learning outcomes	At the end of the course the students should be able: • To find volume using cross-sections; • To find volume using cylindrical shells; • To calculate arc length, areas of surfaces of revolution; • To solve problems involving work and other physical applications; • To apply exponential change to solve real-world problems; • To evaluate definite and indefinite integrals by using techniques of integration; • To evaluate the dot product and cross product of vectors; • To solve application of vectors; • To calculate the limits and continuity in higher dimensions;	

	• To find partial derivatives.		
Teaching methods	**Lecture**		x
	Group discussion		x
	Experiential exercise		x
	Course paper		x
Evaluation	**Methods**	**Date/deadlines**	**Percentage (%)**
	Midterm Exam		30
	Class Participation		5
	Quizzes		20 (2 quizzes)
	Activity		5
	Final Exam		40
	Total		100

Policy

- **Preparation for class**
  The structure of this course makes your individual study and preparation outside the class extremely important. The lecture material will focus on the major points introduced in the text. Reading the assigned chapters and having some familiarity with them before class will greatly assist your understanding of the lecture. After the lecture, you should study your notes and work relevant problems and cases from the end of the chapter and sample exam questions.Throughout the semester we will also have a large number of review sessions. These review sessions will take place during the regularly scheduled class periods.
- **Attendance**
  Students who do not attend more than 25% of online classes will not be allowed to take the exam.
- **Withdrawal (pass/fail)**
  This course strictly follows grading policy of the School of Science and Engineering. Thus, a student is normally expected to achieve a mark of at least 60% to pass. In case of failure, he/she will be required to repeat the course the following term or year.
- **Cheating/plagiarism**
  Cheating or other plagiarism during the Quizzes, Mid-term and Final Examinations will lead to paper cancellation. In this case, the student will automatically get zero (0), without any considerations.
- **Professional behavior guidelines**
  The students shall behave in the way to create favorable academic and professional environment during the class hours. Unauthorized discussions and unethical behavior are strictly prohibited.
- **Participation**
  Every two non-participations of a student removes 1% out of his/her total percentage.
- **Ethics**
  Students should not arrive in late to class.
  All cell phones must be turned off and stowed away before entering class.
  Use of any electronic devices is not allowed in the classroom and violators will be punished accordingly.

Tentative Schedule

Week	Date/Day (tentative)	Topics	Textbook/ Assignments
1	23.09.23 23.09.23	• Volumes Using Cross-Sections • Volumes Using Cylindrical Shells	**Ch. 6.1, 6.2 /** not assigned
2	30.09.23 30.09.23	• Arc Length • Practice	**Ch. 6.3 /** not assigned

3	07.10.23 07.10.23	• Areas of Surfaces of Revolution • Work and Fluid Forces	**Ch. 6.4, 6.5/** not assigned
4	14.10.23 14.10.23	• Moments and Centers of Mass • The Logarithm Defined as an Integral	**Ch. 6.6, 7.1 /** not assigned
5	21.10.23 21.10.23	• Exponential Change and Separable Differential Equations • Hyperbolic Functions	**Ch. 7.2, 7.3/** not assigned
6	28.10.23 28.10.23	• Relative Rates of Growth • Integration by Parts	**Ch. 7.4,8.1/** not assigned **Quiz (10 pts)**
7	04.11.23 04.11.23	• Trigonometric Integrals • **Midterm Exam**	**Ch. 8.2 /** not assigned
8	11.11.23 11.11.23	• Trigonometric Substitutions • Integration of Rational Functions by Partial Fractions	**Ch. 8.3,8.4 /** not assigned
9	18.11.23 18.11.23	• Vectors • Three-Dimensional Coordinate Systems	**Ch.12.1, 12.2, /** not assigned
10	25.11.23 25.11.23	• The Dot Product • The Cross Product	**Ch.12.3, 12.4/** not assigned
11	02.12.23 02.12.23	• Functions of Several Variables	**Ch. 14.1/** not assigned
12	09.12.23 09.12.23	• Limits and Continuity in Higher Dimensions, Partial Derivatives	**Ch. 14.1/** not assigned
13	16.12.23 16.12.23	• The Chain Rule Directional Derivatives and Gradient Vectors	**Ch. 14.4,14.5/** not assigned **Quiz (10 pts)**
14	23.12.23 23.12.23	• Tangent Planes and Differentials • Extreme Values and Saddle Points	**Ch. 14.6,14.7, 14.9 /**not assigned
15	30.12.23 30.12.23	• Taylor's Formula for Two Variables	**Ch. 14.9 /**not assigned
	TBA	**Final Exam**	

This syllabus is a guide for the course and any modifications to it will be announced in advance.