

	Course name: MATH 111 Calculus I		Department: Mathematics				Semester
	Methods of Education						1
	Lecture	Recitation/ (Etud)	Lab	Project/Field Study	Homework	Other	Total
42	28	0	0	70	90	230	8
Language	English						
Compulsory/Elective	Compulsory						
Prerequisites	None						
Course Contents	Week	Subjects					
	1	<ul style="list-style-type: none"> ▪ Real numbers, intervals, absolute value. ▪ Linear and quadratic functions, polynomials and rational functions, trigonometric functions, even and odd functions, exponential and logarithmic functions. 					
	2	<ul style="list-style-type: none"> ▪ Limits of functions. ▪ One-sided limits, Rules for calculating limits, The squeeze theorem. ▪ Limits at infinity, infinite limits. 					
	3	<ul style="list-style-type: none"> ▪ Continuity at a point. ▪ Continuity on an interval, continuous functions. ▪ Intermediate value theorem. 					
	4	<ul style="list-style-type: none"> ▪ The Formal Definition of Limit ▪ Using the definition of limit to prove theorems. 					
	5	<ul style="list-style-type: none"> ▪ Tangent lines, slopes, normal. ▪ Definition of the derivative, the derivative of a function. ▪ Differentiation rules. 					
	6	<ul style="list-style-type: none"> ▪ The chain rule. ▪ Derivatives of trigonometric functions. ▪ Higher-order derivatives. 					
	7	<ul style="list-style-type: none"> ▪ Using differentials and derivatives. ▪ The mean value theorem. ▪ Implicit differentiation. 					
	8	<ul style="list-style-type: none"> ▪ Inverse functions. ▪ Exponential and logarithmic functions. ▪ The natural logarithm and exponential. 					
	9	<ul style="list-style-type: none"> ▪ Growth and decay. ▪ The inverse trigonometric functions. ▪ Hyperbolic functions. 					
	10	<ul style="list-style-type: none"> ▪ Related rates. ▪ Finding roots of equations, Newton's method. ▪ Indeterminate forms, l'Hôpital's Rules. 					
	11	<ul style="list-style-type: none"> ▪ Extreme values. ▪ Classifying critical points, singular points and endpoints of the domain using first derivative test. 					
	12	<ul style="list-style-type: none"> ▪ Concavity and inflections. ▪ Second derivative test. 					
	13	<ul style="list-style-type: none"> ▪ Sketching the graph of a function ▪ Asymptotes. 					
14	<ul style="list-style-type: none"> ▪ Extreme Value Problems. ▪ Linear approximations. ▪ Taylor polynomials, Taylor's formula. 						

Course Objectives	<p>The purpose of this course is</p> <ul style="list-style-type: none"> • to provide a solid introduction to differential calculus in one variable, • to give the basic knowledge on limits, continuity and differentiation and to use them in some real life problems. 		
Learning Outcomes and Competences	<p>Upon completion of this course students will</p> <ul style="list-style-type: none"> • be able to compute basic limits, • understand the limit, continuity and differentiation concepts, • be able to obtain derivatives of functions in one variable, • learn how to use differentiation to solve various type of problems and especially some real life problems. 		
Textbook and /or References	<p>1) Adams, R. A. and Essex, C., <i>Calculus a Complete Course</i>, 9th edition Pearson, 2) Rogawski, J., <i>Single Variable Calculus</i>, 3rd edition W.H. Freeman & CO.</p>		
Assessment Criteria		If any, mark as (X)	Percentage (%)
	Midterm Exams	X	40
	Quizzes		
	Homework		
	Projects		
	Term Paper		
	Laboratory work		
	Other		
	Final Exam	X	60
Instructors			