



# Course Book

<p><b>Course Description</b></p>	<p>This course is designed to provide a firm foundation in beginning Calculus for first-year students. The topics covered are those listed in “The topics”. Each topic will be approached from a variety of ways, providing students the opportunity to solve problems in more than one way, graphically and analytically.</p> <p>Study, through the linear system of equations (formulation and solving) and presenting in Matrix notation. The introduction of the limit, continuity, differentiation, and integration, for a function of one variable. Topics include application on integration and numerical solution of integration.</p>
<p><b>Course objectives</b></p>	<ul style="list-style-type: none"> <li>- To review some necessary terms and methods of algebra.</li> <li>- To discuss equivalent equations and to develop techniques for solving linear, fractional, radical, and quadratic equations.</li> <li>- To explore the real of functions.</li> <li>- To recognize the different forms of equation lines, graph quadratic functions, and solve linear systems.</li> <li>- To Study exponential and logarithmic functions.</li> <li>- To introduce matrices, homogeneous and homogeneous systems.</li> <li>- To know the definition of a derivative and apply the rules for differentiation.</li> <li>- To define indefinite integrals and basic integration formulas.</li> </ul>
<p><b>Student's obligation</b></p>	<ul style="list-style-type: none"> <li>• Class attendance is important, and attendance will be taken at every lecture.</li> <li>• Each student is expected to participate in class discussions and ask questions when topics need clarification.</li> <li>• No phone or texting during lecture.</li> </ul>
<p><b>Required Learning Materials</b></p>	

<b>Evaluation</b>	<b>Task</b>		<b>Weight (Marks)</b>	<b>Due Week</b>	<b>Relevant Learning Outcome</b>
	Paper Review				
	Assignments	Homework	10		
		Class Activity	2		
		Report	8		
		Seminar	8		
		Essay			
		Project			
	Quiz		8		
	Lab.				
	Midterm Exam		24		
	Final Exam		40		
Total					
<b>Specific learning outcome:</b>	<p>1- Solve fractional and radical equations that lead to linear equations.</p> <p>2- Solve quadratic equations by factoring or by using the quadratic formula</p> <p>3- Understand what a function is, determine domains and evaluate functions</p> <p>4- Determine intercepts, apply the vertical line, test and determine the domain and range of a function from a graph.</p> <p>5- Solve systems of linear equations in both two and three variables by elimination, addition, or substitution.</p> <p>6- Recognize and graph exponential and logarithmic functions.</p>				
<b>Course References:</b>	<ul style="list-style-type: none"> <li>- George B.Thomas, "Calculus", International Edition, 2005.</li> <li>- Howard Anton, IrlBivens, and Stephen Davis, "Calculus", Eighth Edition, 2005.</li> <li>- Howard Anton, Albert Herr," Calculus with analytic Geometry", fifth edition, 1995.</li> <li>- Sanat k. Adhikari,"Basic of Professional Mathematics(volume-II) ", first edition,2008</li> </ul>				

Course topics (Theory)	Week	Learning Outcome
Definition of the matrix. Operation of the matrix.	1	
Definition of determinates. Value of determinate of order ( $n \leq 3$ ).	2	
Solving simultaneous linear equations using the inverse matrix method Grammar rule	3	
Definition of the Derivative.	4	
Derivative of implicit function. Definition of the trigonometric function.	5	
Graph of the trigonometric function. Derivatives of the trigonometric function.	6	
Natural Logarithmic function. Graph of Logarithmic ( $y = \ln$ ). Prosperities of Logarithmic ( $\ln$ ). Derivative of Logarithmic ( $\ln$ ).	7	
Graph of exponential. Prosperities of exponential ( $e$ ). Derivative of exponential ( $e$ ).	8	
Definition of integration. Integration of algebraic functions.	9	
Integration of trigonometric functions. Application of integral.	10	
Integration of trigonometric functions. Application of integral.	11	
Areas, Area under a curve and x or y-axis, Areas between curves	12	
Practical Topics	Week	Learning



3/ **Integrate** the following items:

1)  $\int \frac{x^2}{x^3+3} dx$

2)  $\int \sec^2 4x dx$

3)  $\int \frac{x+3}{x^2} dx$

4)  $\int e^{5x} dx$

5)  $\int (\sqrt{x^3} + 2x^3) dx$

**Extra notes:**

**External Evaluator**