

	<b>Course Name:</b> MATH 102 Calculus II					Departments: Computer, Electrical Electronic, Mechanical, Metallurgical and Materials, Energy Systems, Industrial, Civil, Aerospace Engineering		Semester
	Methods of Education							Credit (ECTS)
	Lecture	Recitation/ (Etud)	Lab	Project/Field Study	Homework	Other	Total	6
56	0	0	0	28	94	178		
Language	English							
Compulsory/Elective	Compulsory							
Prerequisites	None							
Course Contents	<b>Weeks</b>	<b>Subjects</b>						
	1	<b>7 Applications of Integration</b> <ul style="list-style-type: none"> <li>7.1 Volumes by Slicing—Solids of Revolution</li> <li>7.2 More Volumes by Slicing</li> </ul>						
	2	<ul style="list-style-type: none"> <li>7.3 Arc Length and Surface Area</li> </ul> <b>8 Conics, Parametric Curves, and Polar Curves</b> <ul style="list-style-type: none"> <li>8.2 Parametric Curves</li> <li>8.3 Smooth Parametric Curves and Their Slopes</li> </ul>						
	3	<ul style="list-style-type: none"> <li>8.4 Arc Lengths and Areas for Parametric Curves</li> <li>8.5 Polar Coordinates and Polar Curves</li> <li>8.6 Slopes, Areas, and Arc Lengths for Polar Curves</li> </ul>						
	4	<b>9 Sequences, Series, and Power series</b> <ul style="list-style-type: none"> <li>9.1 Sequences and Convergence</li> <li>9.2 Infinite series</li> <li>9.3 Convergence Tests for Positive series</li> </ul>						
	5	<ul style="list-style-type: none"> <li>9.4 Absolute and Conditional Convergence</li> <li>9.5 Power Series</li> </ul>						
	6	<ul style="list-style-type: none"> <li>9.6 Taylor and Maclaurin Series</li> <li>9.7 Applications of Taylor and Maclaurin Series</li> </ul>						
	7	<b>10 Vectors and Coordinate Geometry in 3-Space</b> <ul style="list-style-type: none"> <li>10.1 Analytic Geometry in Three Dimensions</li> <li>10.2 Vectors</li> <li>10.3 The Cross Product in 3-Space</li> </ul>						
	8	<ul style="list-style-type: none"> <li>10.4 Planes and Lines</li> <li>10.5 Quadric Surfaces</li> </ul> <b>12 Partial Derivatives</b> <ul style="list-style-type: none"> <li>12.1 Functions of Several Variables</li> </ul>						
	9	<ul style="list-style-type: none"> <li>12.2 Limits and Continuity</li> <li>12.3 Partial Derivatives</li> <li>12.4 Higher-Order derivatives</li> </ul>						
	10	<ul style="list-style-type: none"> <li>12.5 The Chain Rule</li> <li>12.7 Gradients and Directional Derivatives</li> </ul>						
	11	<b>13 Applications of Partial Derivatives</b> <ul style="list-style-type: none"> <li>13.1 Extreme Values</li> <li>13.2 Extreme Values of Functions Defined on Restricted Domains</li> </ul>						

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Course Objectives	<ol style="list-style-type: none"> <li>To apply integration techniques in finding the volume, arc length and surface area of a solid</li> <li>To evaluate the first and second partial derivatives of functions of several variables.</li> <li>To find a maximum or minimum value for a function of several variables</li> <li>To evaluate double integrals of functions of several variables.</li> <li>To apply double integration techniques in evaluating volume of a solid.</li> <li>To use double and triple integrals to find volumes.</li> <li>To use change of variables to evaluate double and triple integrals.</li> </ol>																																
Learning Outcomes and Competences	<p>By the end of this course, a student will be able to:</p> <ul style="list-style-type: none"> <li>determine convergence of improper integrals with discontinuities in their domain or infinite limits of integration</li> <li>interpret a volume of revolution of a function's graph around a given axis as a (Riemann) sum of disks or cylindrical shells</li> <li>express the length of a curve as a (Riemann) sum of linear segments</li> <li>express the surface area of revolution of a function's graph around a given axis as a (Riemann) sum of rings</li> <li>use the concept of polar coordinates to find areas, lengths of curves, and representations of conic sections.</li> <li>use multiple integrals to find volumes</li> </ul>																																
Textbook and /or References	<p><b>Textbook:</b> Calculus, A Complete Course, Ninth Edition, Robert A. Adams, Christopher Essex, Publisher:Pearson, 2018.</p> <p><b>References:</b></p> <ol style="list-style-type: none"> <li>Thomas' Calculus 13th Edition by George B. Thomas Jr., Maurice D. Weir and Joel R. Hass, Publisher: Pearson, 2014.</li> <li>Calculus 8th Ed. by James Stewart (Author) Publisher: Cengage Learning.</li> </ol>																																
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