

## (Module Name) Course Catalogue

### 2022-2023

Institute	Choman Technical Institute	
Department	Department of Information Technology	
Module Name	Mathematics	
Module Code	MAT104	
Semester	1 <sup>st</sup>	
Credit	7	
Module type	Assist.	
Weekly hours	4	
Weekly hours (Theory)	(2)hr Class	(24)hr Workload
Weekly hours (Tutorial)	(2)hr Class	(24)hr Workload
Lecturer (Theory)	Mohamed Moafak Aziz	
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Lecturer (Tutorial)	Mohamed Moafak Aziz	
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# Course Book

- **Course overview:**

Mathematics is an essential subject for students to be acknowledged with logical and practical problems and it is basic for all subjects are taught in Information Technology Department.

- **Course objective:**

At the end of this course the student will be able to:

- To provide an introduction to the fundamentals of calculus.
- To learn the application of mathematics in real life problems and analyzing the results.

- **Student's obligation:**

Students are asked to do home-works. There will be several quizzes during the academic year, not necessarily announced. Attendance in the lecture is mandatory and considered in the grading. Seasonal tests and final exams in order to able to collect required mark to success.

- **Forms of teaching:**

Data show, white board and drawing pad is used throughout the lectures in blended learning strategy.

- **Assessment scheme:**

10 % Homework  
2 % Class Activity  
16% Report, seminar, and Projects  
8% Quiz  
24% Mid. Term Theory Exam  
40% Final theory Exam  

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100% Total

<p>- <b>Specific learning outcome:</b> Having successfully completed this course, you will be able to demonstrate knowledge and understanding of:</p> <ul style="list-style-type: none"> <li>• Know the basic science related to mathematics</li> <li>• Explain the mathematical skills that related to the engineering information's.</li> </ul>		
<p>- <b>Course Reading List and References:</b></p> <ul style="list-style-type: none"> <li>• Thomas' Calculas. George B. Thomas, Jr. Revised by: Maurice D. Weir, Joel Hass. 12th Edition.</li> </ul>		
<p>- <b>Course topics (Theory)</b></p>		
	<b>Week</b>	<b>Learning Outcome</b>
<b>1.</b> The rate of change of a function Coordinates for plane, The slope of a line,	1	Applying the knowledge of functions, domain, and range, Inverses of functions.
<b>2.</b> Equations for lines, Function and graphs	2	Applying the knowledge of Equations for lines, Function and graphs
<b>3.</b> Absolute values, Tangent lines, Limits, Infinity as a limit, Continuity.	3	Applying the knowledge of Absolute values, Tangent lines, Limits, Infinity as a limit, Continuity
<b>4.</b> Derivative , polynomial function and their derivatives, products, power, and quotients.	4	Applying the knowledge of Derivative , polynomial function and their derivatives, products, power, and quotients.
<b>5.</b> Implicit differentiation, the chain rule, A brief review of trigonometry & their derivatives, Parametric equation.	5	Application the knowledge of derivatives, implicit differentiation, the chain rule, A brief review of trigonometry & their derivatives, Parametric equation.
<b>6.</b> Application of derivatives, Curve sketching with the first derivative. Maximum & minimum points .	6	Application the knowledge of derivatives, Curve sketching with the first derivative. Maximum & minimum points.

<p><b>7.</b> Concavity and points of inflection Asymptotes &amp; symmetry Indeterminate forms and Hospital's rule.</p>	<p>7</p>	<p>Identify the Concavity and points of inflection Asymptotes &amp; symmetry Indeterminate forms and Hospital's rule.</p>
<p><b>8.</b> Definite integral: the area under a curve.</p>	<p>8</p>	<p>Applying the knowledge of Definite integral: the area under a curve..</p>
<p><b>9.</b> Differentiation Application. Equation of a straight line. Differentiate the inverse trigonometric functions. Differentiate the inverse hyperbolic functions. Maximum and minimum value.</p>	<p>9</p>	<p>Identify the Differentiation Application. Equation of a straight line. Differentiate the inverse trigonometric functions. Differentiate the inverse hyperbolic functions. Maximum and minimum value.</p>
<p><b>10.</b> Integrations. Standard integrals. Functions of a liner function of X. Integration by part. Integration by partial fraction. Integration of Trigonometrically functions.</p>	<p>10</p>	<p>Identify the Integrations. Standard integrals. Functions of a liner function of X. Integration by part. Integration by partial fraction. Integration of Trigonometrically functions.</p>
<p><b>11.</b> Application of definite integrals , Areas between curves</p>	<p>11</p>	<p>Applying Integrations Application.</p>
<p><b>12.</b> Calculating volumes by disk, washers, &amp; cylindrical shells methods , Lengths of plane curves , The area of a surface of revolution , Moments and centers of mass</p>	<p>12</p>	<p>Identify the Calculating volumes by disk, washers, &amp; cylindrical shells methods ,Lengths of plane curves , The area of a surface of revolution , Moments and centers of mass</p>

**- Examinations (question design):**

**Q1 /A/** Find the slope between (-3, -11) and (0,7)

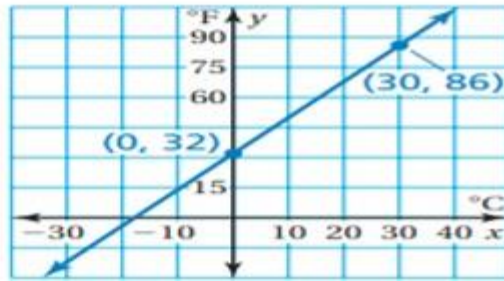
**/B/** Graph the equations:

$$y = |x^2 - 3|$$

$$y = 2^x$$

**Q2 /** The graph relates temperatures (in degrees Fahrenheit) to temperatures  $x$  (in degrees Celsius).

- Find the slope and y-intercept
- Write an equation of line.



**Q3/** Evaluate

- $\lim_{t \rightarrow -5} \frac{t^2 - 25}{t^2 + 2t - 15}$

**Q4/** Find the derivatives of the following functions:

- $y = x^{2x}$
- $m = \frac{3}{2}n^4 - 1$

**Q5/**

- Are the points  $\{(1, 4), (1, 6), (3, 7), (5, 2)\}$  a function or not?
- Solve the equation:  $-12|9x + 1| = 48$

- **Extra notes:**

The use of new technologies and tools such as video conferencing, smart board and visiting sites, helps greatly students to development of science and understanding lectures rapidly.

- **External Evaluator:**

This course book have been reviewed and revised By  
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