

Module (Course Syllabus) Catalogue

2023-2024

College/ Institute	Erbil Technology college	
Department	Road Construction	
Module Name	Mathematics	
Module Code	MAT204	
Degree	Technical Diploma <input type="checkbox"/> *	Bachelor <input type="checkbox"/>
	High Diploma <input type="checkbox"/>	Master <input type="checkbox"/> PhD <input type="checkbox"/>
Semester	2	
Qualification	MSc.	
Scientific Title	Lecturer	
ECTS (Credits)	6	
Module type	Prerequisite <input type="checkbox"/>	Core <input type="checkbox"/> Assist. <input type="checkbox"/> *
Weekly hours	4	
Weekly hours (Theory)	(2)hr Class	Total (162) hrs Workload
Weekly hours (Tutorial)	(2)hr Class	
Number of Weeks	12	
Lecturer (Theory)	Shelan Muhammed Maruf	
E-Mail & Mobile NO.	Shelan.maruf@epu.edu.iq	
Lecturer (Tutorial)	Shelan Muhammed Maruf	
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Websites		

Course Book

<p>Course Description</p>	<p>This course is one of the assistant courses for 1st stage students in road construction departments and aims to introduce the engineering mathematics for the students.</p> <p>This course provides a raw account of the fundamentals that will eventually go into making something useful and necessary, something which may save time, effort, record, or make a thing work. Engineering mathematics is a formal and precise way of communicating information about equations, areas, matrices and precision of engineering formulas. This lecture will ease the student's employment live as the most problems are related to daily engineering live.</p>
<p>Course objectives</p>	<p>The objective of this course is to introduce Technical Road Department students the fundamentals, basics, principles, and applications of mathematics. This includes solving equations (lines, conical sections, etc.), finding the derivatives, Integrations, Intervals, limits, matrices and determinates with its applications.... etc.</p> <p>In addition, learning all this mathematical topics will help students to solve any problem that is related to mathematic topics, when they will graduate and start practical life. For example, supervising any projects, particularly road projects, from surveying processes to excavations, and construction works such as culverts and highways.</p>
<p>Student's obligation</p>	<ul style="list-style-type: none"> • Students must attend all theoretical and tutorial lectures on time. • Student must participate in all exams and quizzes. • If any Exam, assignment or quizzes has missed without formal permission such as medical leave or instructor's prior excuse, the student will receive a score of zero. No extra exams will be given. But if an exam or an assignment was missed due to an excused absence, then the lecturer may make it up again. • Students are obliged to answer and return any homework sheet given to them. • Students must respect the class so attending on time is highly recommended.
<p>Required Learning Materials</p>	<p>- This lecture is four hours per week. Two hours for theoretical lectures which the lecturer gives backgrounds and explain principles of the topic. White board mostly used in addition to computer programs such as Microsoft word and/or power point during the lecture time. Students will be provided with notes and handouts, which contain the detail of the topics.</p>

Evaluation	Tasks		Weight (Marks) %	Due Week	Relevant Learning Outcome	
	Assignments	Homework		10	2,4,7,9,11	
		Class Activity		2		
		Report		8	6	
		Seminar		8	8	
	Quiz		8	3, 5,8,9		
	Midterm Exam		24	6		
	Final Exam		40	12		
	Total		100			
Specific learning outcome:	<ol style="list-style-type: none"> 1. Identify the difference between mathematics and engineering mathematics. 2. Identify mathematical terminology in English language. 3. Applying engineering statistics to use them in future engineering researches. 4. Solve mathematical problems independently. 5. Relate mathematical formulas to real live engineering applications. 6. Apply mathematical problems to find area and volumes surrounded by curves. 7. Collaborate with their colleagues through working in groups in and outside the class. 					
Course References:	<ol style="list-style-type: none"> 1. O'Neil, P. V., 2007. ADVANCED ENGINEERING MATHEMATICS. 3rd Ed. Chris Carson. 2. NARAYAN, S., 2000. INTEGRAL CALCULUS. INDIA: S. CHAND & COMPANY LTD. 3. Thomas', G.B., Weir, M.D., and Hass, J.R., 2010. Thomas' Calculus. Twelfth Ed. America: Addison- Wisely. 4. BHARDWJ, D., 2008. INTEGRAL CALCULUS. 2nd Ed. New Delhi: FIREWALL MEDIA 5. Gupta, T.C., 2008. Problems and Solutions in Higher Engineering Mathematics.1st Ed. New Delhi: LAXMI PUBLICATIONS (p) LTD. 6. Weir, M.D., 2008. THOMAS' CALCULUS EARLY TRANSCENDENTALS. Eleventh Ed. America: Addison Wesley. 					
Course topics (Theory)			Week	Learning Outcome		
Statistical Operations, Frequency Distribution, Frequency Curve.			1			
The Arithmetic Mean, Range, and the Standard Deviation.			2			
Matrices, Determinant and properties, Solving of Linear equations, Cramer's Rule, Applications on the Determinants, Solving equations of Power Analysis.			3			

Vectors, Vector analysis, Vector Quantity, Vectors' Algebra.	4	
Differentiation, Derivative, Algebraic Function Derivatives, Chain Rule, Curved Functions, Derivative of Standard Function High power.	5	
Derivative of Trigonometric Functions, Derivative of Logarithmic Functions.	6	
Derivative of Exponential Functions, Derivative of Hyperbolic Functions	7	
Limits, Limits of Algebraic and Trigonometric Functions, Limit applications.	8	
Integration, Finite Integral, Integration of Algebraic and Logarithmic Functions, Integration of Exponential and Trigonometric Functions.	9	
The Definite Integral, Application of Definite Integral, Area Under the Curve, Area Between Curves, Rotational Volumes, Length of the Curve.	10	
Finding Value of Minimum or Maximum point of Vertical Curve.	11	
Physics and Engineering Applications. .(Work, Moment, Moment of Inertia)	12	
Practical Topics	Week	Learning Outcome

Questions Example Design

The Exam questions in this course are sort of determination and solving for finding unknowns, such as X and Y or graphing curves and finding areas or volumes under the curve. Besides, solving statistic equations such as finding mean, mode and median for a grouped or ungrouped data.

For example:

Q1/ The distance x meters moved by a car in a time (t) seconds, is given by $x = (4t - 2)(6 - t^3)$; find the velocity (v) and distance (x) if acceleration $(a) = 36 \text{ m/sec}^2$

Q2/ Find the area bounded by x-axis and the curve $y = 4 - x^2$, then sketch the graph of the area.

Q3/ Find dx/dy for the following equations:

1- $e^{2x} = \sin(x + 3y)$

2- $y = \ln \cos^2(5x - 6)$

Extra notes:

I have no notifications

External Evaluator

The course book prepared by my colleague is properly arranged and covers the main requirements of the lesson. The lecturing procedures are identified properly. The assessment scheme and forms of teaching are arranged in a way that the student could understand clearly. It can be said that student will be satisfied with this course book and it promises a

good outcome.

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