

Palestine Technical University -Kadoorie  
 Quality Department  
 Tulkarm-P.O. Box: 7  
 Tel: 09/2761026 – 09/12677923  
 Fax: 09/2677922  
 Email: [quality@ptuk.edu.ps](mailto:quality@ptuk.edu.ps)



جامعة فلسطين التقنية – خضوري  
 دائرة الجودة والنوعية  
 طولكرم- ص.ب 7  
 هاتف: 09/2677923  
 فاكس: 09/2677922  
 بريد إلكتروني: [quality@ptuk.edu.ps](mailto:quality@ptuk.edu.ps)

09/2671026

-09/2677923

09/2677922

[quality@ptuk.edu.ps](mailto:quality@ptuk.edu.ps)

<b>College</b>	College of Applied Science		
<b>Department</b>	Applied Mathematics		
<b>Program</b>	Applied Mathematics		
<b>Course Title</b>	Engineering Math 1	<b>Course Number:</b>	15010229
<b>Year</b>	2020/2021	<b>Semester:</b>	Summer semester
<b>Prerequisite(s)</b>	Calculus 2		
<b>Instructor</b>	Mrs. Taqwa Al Khader		
<b>Instructor's e-mail</b>	t.alkhader@ptuk.edu.ps		
<b>Office Hours</b>	08:00-12:00 Sun.		
<b>Class Time</b>	أح اثث ثلاث ارا   10:30 11:45   أحم   11:30 10:30 أحم اثث ثلاث ارا   11:45 13:00   أحم   12:45 11:45	<b>Class Room:</b>	E204
<b>Course description</b>	Linear equations, matrices, determinants, vector spaces and subspaces, linear transformation, eigenvalues and eigenvectors, similarity of square matrices, diagonalization. First order differential equation. The existence and uniqueness theorem differential equation of Higher order.		
<b>Objectives</b>	<p><b>On successful completion of this course the student will be able to achieve the following objectives:</b></p> <ul style="list-style-type: none"> <li>• how to analyze and solve a linear system of equations.</li> <li>• important characteristics of matrices, such as fundamental subspaces, rank, determinant, eigenvalues and eigenvectors.</li> <li>• how to recognize linear transformation.</li> <li>• important concepts of vector spaces such as independence, basis, dimensions.</li> <li>• recognize and classify ordinary differential equations.</li> <li>• solve linear first-order ordinary differential equations.</li> <li>• solve constant-coefficient linear second-order</li> </ul>		

	differential equations.
<b>Course Intended Learning Outcomes (CILOs)</b>	
<b>Textbook(s)</b>	1) Linear Algebra with Applications, 8 <sup>th</sup> Edition, Steven J. Leon. 2) Elementary Differential Equations and Boundary Value Problems, 7 <sup>th</sup> Edition, W. E. Boyce and R.C.Diprima.
<b>Other required material (References):</b>	
<b>Other Resources used (e.g. e-learning, field visits, periodicals, software, etc. )</b>	

**Academic Quality Assurance Department**

**Course Syllabus Form**

<b>Course Teaching Methods</b>	
<b>Teaching Method</b>	<b>CILOs</b>
<b>Zoom Online Meetings</b>	
<b>Recorded Lectures</b>	

<b>Assessment Type</b>	<b>Details/Explanation of assessment in relation to CILOs</b>	<b>Weight</b>	<b>Date(s)</b>
<b>Midterm Exam</b>		40%	
<b>Second Exam</b>			
<b>Quizzes</b>			
<b>Laboratory/Practical</b>			
<b>Assignments</b>		20%	
<b>Project</b>			
<b>Final Exam</b>		40%	
<b>Total</b>		100%	

<b>Course Intended Learning Outcomes (CILOs)</b>	
<b>CILOs</b>	<b>Mapping to Program ILOs</b>

<b>On successful completion of the course, students will be able to:</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>e</b>	<b>f</b>	<b>g</b>	<b>h</b>	<b>I</b>	<b>j</b>

<b>Course Weekly Breakdown</b>					
<b>Week</b>	<b>Date</b>	<b>Topics Covered</b>	<b>CIL Os</b>	<b>Lab Activities</b>	<b>Assessment</b>
1-4		<b>Matrices and Systems of Linear Equations</b> 1.1 Systems of linear equations. 1.2 Row echelon form. 1.3 Matrix Arithmetic. 1.4 Matrix algebra.			
5,6		<b>Determinants.</b> 2.1 Determinant of a matrix. 2.2 Properties of determinants. 2.3 Cramer's rule.			
7-9		<b>Vector Spaces.</b> 3.1 Definition and examples. 3.2 Subspaces. 3.3 Linear independence. 3.4 Basis and dimension. 3.6 Row space and column space.			
10		<b>Linear Transformations.</b> 4.1 Definition and examples.			
10,11		<b>Eigenvalues.</b> 6.1 Eigenvalues and eigenvectors. 6.3 Diagonalization of matrices.			
11		<b>Introduction.</b> 1.4 Classification of differential equations.			
12,13		<b>First Order Differential Equations</b> 2.1 Linear equations with variable coefficients. 2.2 Separable equations. 2.4 Differences between linear and nonlinear equations. 2.6 Exact equations and integrating factors.			
14,15		<b>Second Order Linear Equations</b>			

		<p>3.1 Homogeneous equations with constant coefficients.</p> <p>3.2 Fundamental solutions of linear homogeneous equations.</p> <p>3.3 linear independence and the Wronskian.</p> <p>3.4 Complex roots of the characteristic equation.</p> <p>3.5 Repeated roots; reduction of order.</p> <p>3.6 Nonhomogeneous equations; method of undetermined coefficients.</p> <p>3.7 Variation of Parameters.</p>			
--	--	--	--	--	--

<b>Prepared by:</b>	<b>Mrs. Taqwa Al_Khader</b>	<b>Signature</b>	
<b>Head of Department</b>	<b>Dr. Ata' Asad</b>	<b>Signature</b>	
<b>Date</b>	<b>1/07/2021</b>		