Palestine Technical University-Kadoorie

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**Department of Applied Mathematics**

**Engineering Math 1 Syllabus**

**Second Semester 2020/2021**

**Textbooks:**

1. Linear Algebra with Applications, 7th Edition, Steven J. Leon.
2. Elementary Differential Equations and Boundary Value Problems, 7th Edition, W. E. Boyce and R.C.Diprima.

**Instructors:** Dr. Rania Wannan, Mrs. KefayaAyyash, Mrs. Raghad Abu -shaer

**Course Evaluation:**

* First Exam 30%.
* Second Exam 30%.
* Final Exam 40%.

**Course Outline:**

**Part I.**

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| **Chapter One** | **Matrices and Systems of Linear Equations.*** 1. Systems of linear equations.
	2. Row echelon form.
	3. Matrix algebra.
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| **Chapter Two**  | **Determinants.**2.1 Determinant of a matrix.2.2 Properties of determinants.2.3 Cramer’s rule. |
| **Chapter Three** | **Vector Spaces.**3.1 Definition and examples.3.2 Subspaces.3.3 Linear independence.3.4 Basis and dimension.3.6 Row space and column space. |
| **Chapter Four** | **Linear Transformations**.4.1 Definition and examples. |
| **Chapter Six** | **Eigenvalues**.6.1 Eigenvalues and eigenvectors.6.3 Diagonalization of matrices. |

**Part II.**

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| **Chapter One** | **Introduction.*** 1. Classification of differential

equations. |
| **Chapter Two** | **First Order Differential Equations** 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. |
| **Chapter Three** | **Second Order Linear Equations**3.1 Homogeneous equations with constant coefficients.3.2 Fundamental solutions of linear homogeneous equations.3.3 linear independence and the Wronskian.3.4 Complex roots of the characteristic equation.3.5 Repeated roots; reduction of order.3.6 Nonhomogeneous equations;method of undetermined coefficients.3.7 Variation of Parameters. |