The Hashemite University
Faculty of Science
Course Syllabus
Department of Mathematics

Course Title:	**Ordinary Differential Equations 1, 3(3,0,0)**	**Course Number:**	11101203
Designation:	Compulsory	**Prerequisite(s):**	11101102
Instructor:		**Instructor's e-mail:**	
Office Hours:			

Course Description (catalog): This course sheds light on the solution of differential equations (first order, second order and higher orders) with applications to mechanics and physics. The course will discuss series solution of second order linear ordinary differential equations, Laplace transforms and their applications in solving initial value problems

Textbook(s) and/or Other Supplementary Materials:
 Fundamentals of Differential Equations, 7th edition, by R. K. Nagle and E.B. Saff

References:
   In addition to the required course text the following references are useful:
   1.   Elementary Differential Equations and Boundary Value Problems, by Boyce and Diprima. Wiley, 10th edition , 2012.
   2.   Introduction to Differential Equations, by Richard K. Miller, Prentice Hall, 2nd edition, 1998

Major Topics Covered:

Topics	No. of weeks	Contact hours*
Solution and Initial Value Problems	1	
First order differential equation	1	
Second order linear differential equation	2	
Higher order linear differential equations	1	
Laplace transform	1	
Series Solution of differential equations	1	
Total	**7**	

 *Contact hours include lectures, quizzes and exams.

Specific Outcomes of Instruction (Course Learning Outcomes):
   After completing the course, the student should be able to:
1. Find general solutions to first-order, second-order, and higher-order homogeneous and non homogeneous differential equations by manual and technology-based methods.
2. Identify and apply initial values to find particular solutions to first-order, second-order, and higher order homogeneous and non-homogeneous differential equations by manual and technology-based methods, and analyze and interpret the results.
3.   Select and apply appropriate methods to solve differential equations; these methods will include, but are not limited to, undetermined coefficients, variation of parameters, eigenvalues and eigenvectors, Laplace and inverse Laplace transforms.
4. Select and apply series techniques to solve differential equations; these techniques will include but are not limited to Taylor series.

Student Outcomes (SO) Addressed by the Course:

#	Outcome Description	Contribution
	General Engineering Student Outcomes	
(a)	an ability to apply knowledge of mathematics, science, and engineering	H
(b)	an ability to design and conduct experiments, as well as to analyze and interpret data	
(c)	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	
(d)	an ability to function on multidisciplinary teams	
(e)	an ability to identify, formulate, and solve engineering problems	
(f)	an understanding of professional and ethical responsibility	
(g)	an ability to communicate effectively	
(h)	the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
(i)	a recognition of the need for, and an ability to engage in life-long learning	
(j)	a knowledge of contemporary issues	
(k)	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	
	H=High, **M**= Medium, **L**=Low	

Grading Plan:

MID Exam: 40 points

HW's & Qs   10 pints
Final Exam: 50 points

Prepared by: Dr. Omar Alsayyed   **Date:**   5/7/2020