

**ISHIK UNIVERSITY**  
**FACULTY OF ENGINEERING**  
**Department of PETROLEUM AND MINING ENGINEERING,**  
**2018-2019 Fall**  
**Course Information for PTR 221 Differential Equations**

<b>Course Name:</b>		Differential Equations				
<b>Code</b> PTR 221	<b>Course type</b> 2	<b>Regular Semester</b> 1	<b>Theoretical</b> 3	<b>Practical</b> -	<b>Credits</b> 3	<b>ECTS</b> 4
<b>Name of Lecturer(s)- Academic Title:</b>		Brwa Ahmed -				
<b>Teaching Assistant:</b>		A				
<b>Course Language:</b>		English				
<b>Course Type:</b>		Non-area Elective				
<b>Office Hours</b>		Tuesday 2 - 5 and Thursday 2 - 5 pm				
<b>Contact Email:</b>		brwa.ahmed@ishik.edu.iq  Tel:07501983073				
<b>Teacher's academic profile:</b>		aaa				
<b>Course Objectives:</b>		This course is to provide students with quantitative and problem-solving skills of differential equations with a main focus on first and second order linear differential equations with constant coefficients-both homogeneous and nonhomogeneous. At the end of this course, students should be able to: • Solve basic first order ODE. • Solve higher order linear ODE and systems of linear ODEs, using various methods including undetermined coefficients and the Laplace transform. • Be familiar with applications in electrical and mechanical systems, forced oscillation, and resonance. • Be able to construct simple ODE models (linear and non-linear) • Be able to apply basic tools from linear algebra (matrices, row-reduction, vector spaces, and eigenvalues/eigenvectors) to obtain the solution to systems of equations and systems of linear differential equations.				
<b>Course Description (Course overview):</b>		-				
<b>COURSE CONTENT</b>						
<b>Week</b>	<b>Hour</b>	<b>Date</b>	<b>Topic</b>			
1	3	2-4/10/2018	- - -			
2	3	7-11/10/2018	- - -			
3	3	14-18/10/2018	Introduction to Differential Equations			
4	3	21-25/10/2018	First Order Ordinary Differential Equations			
5	3	28/10-1/11/2018	Solution of First Order Ordinary Differential Equations			
6	3	4-8/11/2018	Second Order Ordinary Differential Equations			
7	3	11-15/11/2018	Solution of Second Order Ordinary Differential Equations			
8	3	18-22/11/2018	Midterm Exam			
9	3	25-29/11/2018	Laplace Transforms			
10	3	2-6/12/2018	Laplace Transforms			
11	3	9-13/12/2018	Systems of Linear Differential Equations			
12	3	16-20/12/2018	Systems of Linear Differential Equations and Matrices			
13	3	23-24/12/2018	Higher Order Differential Equations			
14	3	2-3/1/2019	Partial Differential Equations			

15	3	7-10/1/2019	Review
16	3	13-17/1/2019	Final Exam
17	3	20-24/1/2019	Final Exam
COURSE/STUDENT LEARNING OUTCOMES			
1	Classification of DE		
2	Ordinary differential equations		
3	Partial differential equations		
4	Laplace transforms		
5	Higher Order Differential Equations		
COURSE'S CONTRIBUTION TO PROGRAM OUTCOMES (Blank : no contribution, I: Introduction, P: Profecient, A: Advanced )			
Program Learning Outcomes			Cont.
1	Gradutes have the competent or expertise to apply the principals of engineering knowledge, mathematics, and science in the analyses of petroleum and mining engineering and related fields.		I
2	Graduates have the ability to gain in-depth technical ability in petroleum and mining engineering.		I
3	Graduates have the ability to detect, determine, analyze, identify, and solve petroleum and mining engineering problems.		I
4	Graduates have the ability to design system components or processes to meet the required demands of profession.		I
5	Graduates have the ability to practice effectively and proficiently in both individual and group settings.		I
6	Graduates have the ability to solve problems professionally and logically including social, economic, technological, and environmental aspects.		I
7	Graduates will acquire effective communication abilities in the society in general, in more professional settings.		I
8	Gradute will be able to utilize relevant skills, techniques, methods, and tools, needed for any specific mission.		I
9	Gradutes will gain the ability to recognize and utilize the latest technology in his field.		I
10	Graduates will be equipped with ability to pursue the self-advancement and self-development in their professional careers.		I
Prerequisites (Course Reading List and References):		Algebra, calculus I, calculus II	
Student's obligation (Special Requirements):		students should cautiously attend the lectures follow the notes and instructions given by the lecturer	
Course Book/Textbook:		Worldwide Differential Equations and Linear Algebra, by Robert McOwen	
Other Course Materials/References:		Lecture notes PPT, videos and some other pdf files <a href="https://www.math.ust.hk/~machas/differential-equations.pdf">https://www.math.ust.hk/~machas/differential-equations.pdf</a>	
Teaching Methods (Forms of Teaching):		Lectures, Practical Sessions, Excersises, Presentation, Self Evaluation, Assignments	
COURSE EVALUATION CRITERIA			
Method	Quantity	Percentage (%)	
Attendance	1	5	
Participation	10	1	
Quiz	3	5	
Homework	2	5	
Midterm Exam(s)	1	20	
Final Exam	1	40	
Total		100	
Examinations: True-False, Multiple Choices, Short Answers			
Extra Notes:			

**ECTS (ALLOCATED BASED ON STUDENT) WORKLOAD**

<b>Activities</b>	<b>Quantity</b>	<b>Duration (Hour)</b>	<b>Total Work Load</b>
Course Duration (Including the exam week: 16x Total course hours)			0
Hours for off-the-classroom study (Pre-study, practice)			0
Assignments Mid-terms			0
Final examination			0
Other			0
<b>Total Workload</b>			<b>0</b>
<b>ECTS Credit (Total workload/25)</b>			<b>0</b>

**Peer review**

Signature:

Name:

Lecturer

Signature:

Name:

Head of Department

Signature:

Name:

Dean