Course Specification

(Bachelor)

Course Title:	Differential Equations
Course Code:	MH223
Program:	Computer Science
Department:	Basic Sciences and Humanities
College:	College of Computer and Information Sciences
Institution	Majmaah University
Version:	2023
Last Revision Date:	11/09/2023

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (3,1,0)					
2. Course type					
A.	☐University	☒ College	☐Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (Level 5)					
4. Course general Description: Mathematics					
5. Pre-requirements for this course (MH123)**:**					
6. Pre-requirements for this course (if any)**:**					
7. Course Main Objective(s):					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	44	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	15
5.	**Others (specify)**	
Total		60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1				
1.2				
...				
2.0	**Skills**			
2.1	CLO1- Discriminate differential equation and its order			
2.2	CLO2- Solve first-order differential equations			
2.3	CLO3- Solve higher order differential equations			
2.4	CLO4- Use mathematical modeling to solve some applicable problems by differential equations methods.			
3.0	**Values, autonomy, and responsibility**			
3.1				
3.2				
...				

C. Course Content

No	List of Topics	Contact Hours

1.	Introduction to differential Equations. First order Differential Equations	4
2.	Separable differential Equations, Linear differential equations,	4
3.	Exact differential Equations, Bernoulli and Riccatti Differential Equations.	4
4.	Higher order differential Equations: Principle of superposition, the Wronskian	4
5.	Homogeneous differential equations with constant coefficients. Reduction of order method	4
6.	Undetermined coefficients method, Variation of parameters method	4
7.	Mathematical Modeling- Population Growth and decay	4
8.	radioactive isotope and carbon dating, Chemical mixtures. RL- electrical series circuits,	4
9.	Newton's law of cooling and computing time of death, Drug distribution in human body	4
10.	Banking loans and money investment,	4
11.	Mathematical Modeling- Higher order Equations	4
12.	Vibrating springs and pendulum	4
13.	Damped vibration motion	4
14.	LRC- electrical series circuits	4
15.	Motion of particles in space.A319	4
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	3,7,11	20%
2.	Assignments	3,6,9,13	15%
3.	Mid Term Exam	8	20%
4.	Class Participation	All weeks	5%
5.	Final Exam	16	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Differential Equations with Boundary Value Problems Dennis G.ZILL and Warren S. Wright Brooks/ Cole Cengage learning USA, Year – 2012;Edition -10 ISBN:1111827060
Supportive References	

Electronic Materials	
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom
Technology equipment (projector, smart board, software)	Smart Board, Projector
Other equipment (depending on the nature of the specialty)	Internet Connection

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Peer faculty members	direct
Effectiveness of Students assessment	Students	indirect
Quality of learning resources	Faculty	direct
The extent to which CLOs have been achieved	Peer Reviewer	direct
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Dr. Ahmed Farghaly
REFERENCE NO.	**170986**
DATE	11 September fall 2023