Course Specifications

Course Title:	Differential Equation 1
Course Code:	240Math-3
Program:	Mathematics
Department:	Mathematics
College:	College of Science and Arts
Institution:	Najran University

Table of Contents

A. Course Identification

1. Credit hours: 3	

2. Course type

a. University ☐ College ☐ Department ☒ Others ☐

b. Required ☒ Elective ☐

3. Level/year at which this course is offered: Third

4. Pre-requisites for this course (if any):

112Math 3

5. Co-requisites for this course (if any):N/A

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100%
2	Blended		
3	E-learning		
4	Correspondence		
5	Other		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	45
2	Laboratory/Studio	
3	Tutorial	
4	Others (specify)	3
	Total	48
Other Learning Hours*		
1	Study	30
2	Assignments	10
3	Library	10
4	Projects/Research Essays/Theses	
5	Others(specify)	15
	Total	113

*The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

This course is an introduction to the study of ordinary differential equations. In this course, the definition, classification and different methods of solution are presented. Some physical, engineering, chemical, biological and other applications are also studied.

2. Course MainObjective

The main objectives of the course is to familiarize the students with the essential concepts and the solutions of ordinarydifferential equations.

3. Course Learning Outcomes

	CLOs	AlignedPLOs
1	**Knowledge:** By the end of the semester, the students will be able to	
1.1	**List the solutions of the differential equations of different kinds.**	L1
1.2	**Describe how to formulate a differential equation corresponding to some physical and mathematical laws and engineering**	L1
1.3		
1...		
2	**Skills :** By the end of the semester, the students will be able to	
2.1	**Construct the differential equations**	L1
2.2	**Find the solutions of the differential equations**	L1
2.3		
2...		
3	**Competence:**	
3.1	promoting free, creative and critical thinking.	
3.2	working independently.	
3.3	searching for data and information and analyzing them.	
3...		

C. Course Content

No	List of Topics	Contact Hours
1	**Classification of Differential Equations (DEs), the order and degree of DE - Linearity, kinds of Solution, Constructing DEs**	5
2	**First order DEs with first degree (separable equation)**	5
3	**Homogeneous and inhomogeneous differential equations**	5
4	**Exact and non exact DEs, Linear and nonlinear DEs**	10
5	**Solution of DEs with first order and highest degree**	8
6	**Second order linear DEs with constant coefficients.** **The Laplace transforms., study some applications**	12
	Total	45

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	TeachingStrategies	AssessmentMethods
1.0	**Knowledge**		
1.1	List the solutions of the differential equations of different kinds.	Class motivations and discussions	Homework assignments
1.2	Describe how to formulate a	Solved problems	Collaborative

Code	Course Learning Outcomes	TeachingStrategies	AssessmentMethods
...	differential equation corresponding to some physical and mathematical laws and engineering	method	learning and Team work
2.0	**Skills**		
2.1	Construct the differential equations	Class discussions	Training reports, Quizzes
2.2	Find the solutions of the differential equations	Class discussions	Training reports, Quizzes
...			
3.0	**Competence**		
3.1	promoting free, creative and critical thinking.		
3.2	working independently.		
...	searching for data and information and analyzing them.		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Assignment 1	3	
2	Assignment 2	4	
3	Assignment 3	5	
4	Assignment 4	6	
5	Assignment 5	8	
6	Assignment 6	9	
7	Assignment 7	10	
8	Assignment 8	11	

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

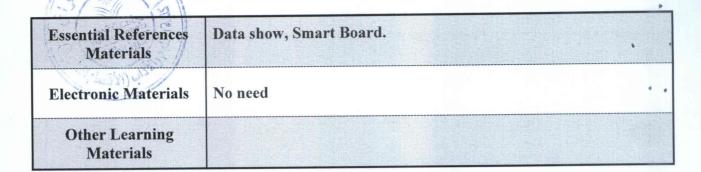# E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Available at office hours per week and reachable via email and Blackboard

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	• Classrooms number of seats = 20 seat • Computer rooms containing at most 21 PCs Rooms equipped with modern teaching techniques and different display devices.

Essential References Materials	Data show, Smart Board.
Electronic Materials	No need
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Hassan Mustafa Alauidy , Abdel Wahab Abbas Rajab and Sana Ali Zare (2006) , Library of Al-Roshd , Differential Equations - Part I
Technology Resources (AV, data show, Smart Board, software, etc.)	• Kent; Nagle;Saff; Snider, Fundamentals Of Differential Equations And Boundary Value Problems (SixthEdition), Amazon • Earl D. Rainville, Phillip E. Bedient, Elementary Differential Equations (Seventh Edition) , Macmillan Publishing Company
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	http://www.nu.edu.sa/gui/SubDefault.aspx?PageId=696 http://lib.nu.edu.sa/digitalLibbrary.aspx?PageId=1494 http://lib.nu.edu.sa/SubLibbrary.aspx?PageId=1491 https://twitter.com/math1427?lang=ar http://en.wikipedia.org/wiki/Differential_equation http://mathworld.wolfram.com/OrdinaryDifferentialEquation.html http://mathforum.org/differential/differential.html

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching	**Students**	**Electronic Evaluations**
Extent of achievement of course learning outcomes	**Faculty Members**	**Analysis work by Microsoft-Excel**
Quality of learning resources	**Students, Faculty Members**	**Questionnaires**

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes,Quality oflearning resources, etc.)
Evaluators (Students,Faculty, Program Leaders,Peer Reviewer, Others (specify)
Assessment Methods(Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	