هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TPG-153

Course Specification

(Postgraduate)

Course Title:	Differential Equations
Course Code:	Math 620
Program:	Master of Science in Mathematics
Department:	Mathematics
College:	College of Science and Humanities
Institution:	Prince Sattam Bin Abdulaziz University
Version:	2
Last Revision Date:	Oct 2024

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A. General information about the course:

1. Course Identification:

1. Credit hours: 3(3,0,0)				
2. Course type				
A.	☐University	☐College	☒ Department	☐Track
B.	☒ Required		☐Elective	
3. Level/year at which this course is offered: (First)				
4. Course general Description:				
Existence and uniqueness of solutions of linear systems. Stability theory. Poincare's theory for two dimensional systems. Sturm-Liouville boundary problems.				
5. Pre-requirements for this course (if any)**:**				
NIL				
6. Co-requirements for this course (if any)**:**				
NIL				
7. Course Main Objective(s):				
To make the students aware of Stability Theory, Poincare's Theory etc. and solve differential equations including Sturm-Liouville Boundary Problems using various techniques				

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	3 Hours per week	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning	In case of any exigency	
4	Distance learning		

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures (16 X 3)**	48
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)……**	
	Total	48

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	**Able to recall and reproduce the concepts of Stability Theory, Poincare's Theory**	**K1**	**Classroom lectures Tutorial session Interactive session Group and Individual discussion**	**At least Two Quiz Mid Semester Exam End Semester Exam**
1.2	**Able to identify different types of boundary value problems and describe appropriate techniques to solve the same.**	**K3**		
2.0	**Skills**			
2.1	**Able to analyze the existence of solutions to a given differential equation**	**S1**	**Classroom lectures Tutorial session Interactive session Group and Individual discussion**	**At least Two Quiz Mid Semester Exam End Semester Exam**
2.2	**Solve Sturm-Liouville Boundary Problems using various techniques**	**S1**		
3.0	**Values, autonomy, and responsibility**			
…				

C. Course Content:

No	List of Topics	Contact Hours
1.	Existence and uniqueness of solutions of linear systems	12
2.	Stability theory	12
3.	Poincare's theory for two dimensional systems	12
4.	Sturm-Liouville boundary problems	12
	Total	48

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz	5 and 11	5%
2.	First Midterm Exam	7	20%
3.	Second Mid Term Exam	12	20%
4.	Homework, Assignment etc.	Continuous	5%
5.	Final Exam	17	50%

*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	Edwards C., and Penney D., " Differential Equations with Boundary Value Problems", 5th ed. Upper Saddle River, NJ: Prentice Hall, (2003), ISBN: 013145773X. - William Boyce, and Richard C. DiPrima, " Differential Equations and Boundary Value Problems", 7th ed, John Wiley and Sons
Supportive References	
Electronic Materials	
Other Learning Materials	Lecture notes prepared by course instructor

G. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom to accommodate 20 students
Technology equipment (Projector, smart board, software)	Smart Board, Projector, Licensed version of Blackboard to handle lecture remotely in case of exigencies.

Items	Resources
Other equipment (Depending on the nature of the specialty)	**NIL**

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students, Graduates	Course Evaluation and Program Evaluation Survey (Indirect)
	Program Leaders	Peer review (Direct)
Effectiveness of students' assessment	Students	Indirect
Quality of learning resources	Students, Graduates	Indirect (Program Evaluation and Alumni Survey)
	Faculty	Indirect (Survey)
The extent to which CLOs have been achieved	Course Instructor CLO/PLO Analysis Team	Direct and Indirect
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	**03 OCT 2024**