



Course Specifications

Course Title:	Ordinary differential equations I
Course Code:	MATH 3330
Program:	Bachelor of science in mathematics
Department:	Mathematics
College:	College of Science and Humanities
Institution:	College of Science and Humanities

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A. Course Identification

1. Credit hours:	4(4,0,0)
2. Course type	
a.	University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b.	Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered:	Level: 7
4. Pre-requisites for this course (if any):	Math 2250, Math 2311
5. Co-requisites for this course (if any):	NONE

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	Weekly 4 hours	100%
2	Blended	None	0%
3	E-learning	None	0%
4	Distance learning	None	0%
5	Other	None	0%

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	48
2	Laboratory/Studio	0
3	Tutorial	0
4	Others (specify)	60
	Total	108

B. Course Objectives and Learning Outcomes

1. Course Description

First Order Equations: Non-Linear Separable – Homogeneous – Exact Equation – Linear Bernoulli's Equation – Direction Fields. Second Order Linear Equations with Constant Coefficients – Homogeneous case – Non-homogeneous Equations via Method of Undetermined Coefficients – Non-homogeneous Equations via Method of Variation of Parameters – Remarks on Higher Order Equations – Linear Independence and the Wronskian – Applications to Forced Oscillation Problems – Effect of Resonances – Laplace Transform Application to Constant Coefficient Linear Equations - Fourier Series

2. Course Main Objective

The Objective is to make the students gain awareness about concept of Differential Equations and its applications and various methods and techniques to find their solutions.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge and Understanding	
1.1	Acquire knowledge about Differential equation, Order, Degree and types, Laplace transform and its use	K1
1.2	Be familiar with the classification of Differential Equations and the methods to solve them	K4
2	Skills :	
2.1	Able to form Differential Equations and find solutions of first order differential equations	S2

C. Course Content

No	List of Topics	Contact Hours
1	Review of basic concepts of Differential Equations – Order – Degree	4
2	Types of First Order Differential Equations	3
3	Solutions of Non Linear Separable and Homogeneous Equations	4
4	Exact Equations and Linear Bernoulli's Equations – Direction Fields	3
5	Second Order Linear Equations with Constant Coefficients	4
6	Non Homogeneous Equations – Undetermined coefficients	3
7	Non Homogeneous Equations – Method of Variation of Parameters	4
8	Higher order equations	3
9	Linear Independence and Wronskian	4
10	Applications : Forced Oscillation Problems	3
11	Effect of Resonance	4
12	Laplace Transforms	6
13	Fourier Series	3
Total		48

D. Teaching and Assessment

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

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and Understanding		
1.1	Acquire knowledge about differential equation and its applications	1. Class Room Lectures 2. Interactive sessions 3. Exclusive Office Hours for clearing doubts in small groups	1. Two Internal Exams 2. At least two Quiz 3. End Semester Exam
1.2	Be familiar with the classification of first order Differential Equations and the methods to solve them		
2.0	Skills		
2.1	Able to classify various types of First order differential equations and finding their solutions	1. Application oriented exercises during tutorial session 2. Homework to improve the analytical skills	1. Homework 2. Assignments 3. Quiz

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Mid Term Exam I	6	20%
2	Quiz	4 & 10	5%
3	Mid Term Exam II	13	20%
4	Continuous Assessment – Homework, Assignment, Attendance etc.	--	5%
5	End Semester Exam	15	50%

*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 :

1. Exclusive Office Hours – 5 Hours per week
2. Academic Advising for Students – 1 Hour per week

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	-Edwards C., and Penney D., "Elementary Differential Equations with Boundary Value Problems", 5th ed. Upper Saddle River, NJ: Prentice Hall, (2003), ISBN: 013145773X. - William Boyce, and Richard C. DiPrima, "Elementary Differential Equations and Boundary Value Problems", 7th ed, John Wiley and Sons
Essential References Materials	
Electronic Materials	Paul's Online Series, Blackboard
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms with Smart boards with seating facilities for at least 30 students
Technology Resources (AV, data show, Smart Board, software, etc.)	Smartboard, Internet Connection for Blackboard
Other Resources (Specify, e.g. if specific laboratory	NIL

Item	Resources
equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Teaching	Students, Graduates	Course Evaluation and Program Evaluation Survey (Indirect)
	Program Leaders	Peer Review (Direct)
Achievement of CLOs	Faculty and Quality Personnel	Direct (Tests and Quiz) and Review of Course Report
Quality of Learning Resources	Students	Course Evaluation (Indirect)
	Graduates	Program Evaluation (Indirect)
Facilities	Students / Graduates	Course and Program Evaluation (Indirect)
	Faculty	Faculty Survey (Indirect), Course Reports (Direct)

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

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

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	