



Academic Quality Assurance Department

Course Syllabus Form

College	Faculty of Applied Science		
Department	Applied mathematics		
Program	Applied mathematics program		
Course Title	Numerical analysis	Course Number:	15010325
Year	2023-2024	Semester:	Summer Semester
Prerequisite(s)			
Instructor	Dr. Rania Wannan		
Instructor's e-mail	r.wannan@ptuk.edu.ps		
Office Hours	8:00-10:00 Sun. Mon. Tue.		
Class Time	08:00-10:00 Wed.	Class Room:	E204
Course description	<p>The basic idea of numerical analysis is to find an approximation for the solution which could not be found analytically. This course contains the following topics: solving equations with one variable, Lagrange interpolation and polynomial approximations, solving system of linear equations and IVP of ordinary differential equations.</p>		
Course Intended Learning Outcomes (CILOs)	<ol style="list-style-type: none"> 1. To use different techniques for solving equations in one variable. 2. To use Lagrange interpolation for approximating polynomials. 3. To use different methods for solving linear systems. 4. To solve IVP ordinary differential equations. 		
Textbook(s)	Numerical Analysis 9th Edition (Burden & Faires)		
Other required material (References):			
Other Resources used (e.g. e-learning, field visits, periodicals, software, etc.)			

Course Teaching Methods	
Teaching Method	CILOs
Discussion	
Assignment	
Lecture in Zoom program	



Assessment Type	Details/Explanation of assessment in relation to CILOs	Weight	Date(s)
Midterm exam		35%	
Quizzes(discussion)			
Laboratory/Practical			
Assignments		20%	
Project			
Final Exam		45%	
Total		100%	

Course Intended Learning Outcomes (CILOs)										
CILOs	Mapping to Program ILOs									
On successful completion of the course, students will be able to:	a	B	c	d	e	f	g	h	I	j
1. To use different techniques for solving equations in one variable.										
2. To use Lagrange interpolation for approximating polynomials.										
3. To use different methods for solving linear systems.										
.4- To solve IVP ordinary differential equations										
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Course Weekly Breakdown					
Week	Date	Topics Covered	CILOs	Lab Activities	Assessment
1		1.1 Review of calculus 1.2 Round-off Error and computer arithmetic			
2,3		2.1 Bisection Method 2.2 Fixed point – iteration 2.3 Newton's Method			
4		2.4 Error Analysis for iterative method 2.6 Zeroes of polynomials and Muller's Method			



5,6		. 3.1 Interpolation and the Lagrange polynomial and Nevil's Method.			
7		3.2 Divided Differences			
8		4.1 Numerical Differentiation			
9		4.3 Elements of numerical integration			
10		4.4 Composite of numerical integration			
11		7.1 Norms of vectors and matrices			
12		7.3 Iterative techniques for solving linear system			
13,14		5.1 The elementary theory of IVPs 5.2 Euler Method 5.3 Higher order Taylor methods			
15		5.4 Runge Kutta methods			

Prepared by:	Dr. Rania Wannan	Signature	
Head of Department	Dr. Rania Wannan	Signature	
Date	02\03\2024		