



Jordan University of Science and Technology
Faculty of Science & Arts
Mathematics Department

MATH321 Numerical Analysis (1) - JNQF Level: 7

First Semester 2024-2025

Course Catalog

3 Credit Hours. Introduction to computational errors and their sources, solutions of non-linear equations of one variable using (Bisection, Newton's, Secant and Fixed-point), interpolation theory (Lagrange), curve fitting, finite differences, numerical differentiation and integration, solution of linear systems by direct and indirect methods.

Teaching Method: Blended

Text Book

Title	Numerical Analysis
Author(s)	R. L. Burden and J. D. Faires
Edition	9th Edition
Short Name	Text
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref #1	Introduction to Numerical Analysis Using Matlab	Rizwan Butt	1st Edition	
Ref #2	Numerical Methods	Peter Linz and Richard Wang	1st Edition	
Ref #3	Elementary Numerical Analysis	K. Atkinson	2nd Edition	

Instructor

Name	Prof. Kamel Al-Khaled
Office Location	PH2, level 1, Ext. 23454

Office Hours	Sun : 09:30 - 12:30 Mon : 11:00 - 13:00 Tue : 11:00 - 13:00 Wed : 10:00 - 11:00 Thu : 10:00 - 12:00
Email	kamel@just.edu.jo

Instructor	
Name	Prof. Mohammad Al-Towaiq
Office Location	Ph L0
Office Hours	Sun : 13:00 - 15:00 Mon : 11:00 - 12:00 Tue : 13:00 - 15:00 Wed : 11:00 - 12:00
Email	towaiq@just.edu.jo

Class Schedule & Room
<p>Section 1: Lecture Time: Mon : 08:30 - 10:00 Room: NG43</p> <p>Section 2: Lecture Time: Mon : 08:30 - 10:00 Room: NG42</p>

Prerequisites		
Line Number	Course Name	Prerequisite Type
1731150	CS115 Programming In C++	Prerequisite / Pass
821023	HSS102MATH Calculus 2	Prerequisite / Pass
901020	MATH102 Calculus 2	Prerequisite / Pass
821151	HSS115CS Programming In C++	Prerequisite / Pass

Tentative List of Topics Covered		
Weeks	Topic	References
Weeks 1, 2	Chapter 1: Number Representation and Errors	From Text
Weeks 3, 4, 5	Chapter 2: Solution of Equations in One Variable(Root Finding)	From Text
Weeks 6, 7, 8	Chapter 3: Interpolation and Polynomial Approximation	From Text
Weeks 9, 10, 11, 12	Chapter 4: Numerical differentiation and integrals	From Text
Weeks 13, 14, 15	Chapters 6 and 7: Solution of linear systems: Direct and Iterative Methods (Jacobi and Gauss Seidel Methods)	From Text

Week 16	Final Exams	
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Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
understand the number systems and the errors types [1SLO1(K1S1)]	10%	
Compute an approximate root of a nonlinear equation using different numerical techniques [1SLO2(S23C1)] [1L7K1]	20%	
: interpolate and approximate a given discrete data or function using different numerical techniques. [1SLO2(S23C1)] [1L7S3]	15%	
approximate the derivatives and evaluate integrals numerically. [1SLO1(K1S1)] [1L7S2]	20%	
solve linear systems using direct and indirect (iterative) methods. [1SLO1(K1S1)] [1L7S3]	20%	
Implement any of the numerical algorithms in computer using any programming language or any available software such as Mathematica and Matlab [3SLO1(K1S1), 4SLO2(S23C1), 8SLO6(S2C3)] [5L7S2, 5L7S3, 5L7C1]	15%	

Relationship to Program Student Outcomes (Out of 100%)					
SLO1(K1S1)	SLO2(S23C1)	SLO3(C24)	SLO4(C3)	SLO5(C4)	SLO6(S2C3)
53	39				8

Relationship to NQF Outcomes (Out of 100%)			
L7K1	L7S2	L7S3	L7C1
20	25	40	5

Evaluation	
Assessment Tool	Weight
1st Exam	20%
2nd Exam	25%
Project and Quizzes	15%
Final Exam	40%

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