



Jordan University of Science and Technology
Faculty of Engineering
Civil Engineering Department

CE304 Numerical Methods - JNQF Level: 6

Second Semester 2024-2025

Course Catalog

2 Credit Hours. Numerical Methods (2Cr. Hr.) Machine epsilon, round-off error, linear systems of equations, Gauss elimination and iterative methods, largest eigenvalue using power methods, spline interpolation, numerical integration, ordinary differential equations, nonlinear equations, zeros of polynomials, one-dimensional optimization, least squares data fitting, singular value decomposition, uniform random number generator.

Teaching Method: Blended

Text Book

Title	Numerical Methods for Engineers.
Author(s)	S. Chapra and R. Canale.
Edition	6th Edition
Short Name	Ref #1
Other Information	

Instructor

Name	Mrs. Nesreen Amari
Office Location	-
Office Hours	
Email	nkamari@just.edu.jo

Class Schedule & Room

Section 1:

Lecture Time: Mon : 10:30 - 11:30

Room: C2009

Section 2:

Lecture Time: Thu : 11:00 - 12:00

Room: C2008

Prerequisites

Line Number	Course Name	Prerequisite Type
902030	MATH203 Ordinary Differential Equations	Prerequisite / Pass
822030	HSS203MATH Ordinary Differential Equations	Prerequisite / Pass
2001140	NE114 Programming For Engineers	Prerequisite / Study

Tentative List of Topics Covered

Weeks	Topic	References
Weeks 1, 2	Solving system of linear equations.	
Weeks 3, 4	Solving single non-linear equations.	
Week 5	Solving non-linear system of equations.	
Week 6	Numerical differentiation.	
Weeks 7, 8	Interpolation and curve fitting.	
Weeks 9, 10	Numerical Integration using variety of methods.	
Weeks 11, 12	Solution of ordinary differential equations.	
Weeks 13, 14	Solution of partial differential equations.	
Week 15	Introduction to the finite element method.	

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Be able to estimate numerical errors encountered in the applications of numerical methods. [1PI-1a] [1L6K1]	10%	
Be able to solve nonlinear equations using several numerical methods. [1PI-1a] [1L6K1]	20%	
Be able to solve systems of linear equations using several methods. [1PI-1a] [1L6K1]	20%	
Be able to perform data curve fitting using least square regression and interpolation, [1PI-1a] [1L6K1]	20%	

Be able to perform numerical differentiation and numerical integration. [1PI-1a] [1L6K1]	20%	
Be able to solve ordinary differential equations using numerical methods. [1PI-1a] [1L6K1]	10%	

Relationship to Program Student Outcomes (Out of 100%)											
PI-1a	PI-2a	PI-2b	PI-2c	PI-2d	PI-3a	PI-4a	PI-4b	PI-5a	PI-6a	PI-6b	PI-7a
100											

Relationship to NQF Outcomes (Out of 100%)	
L6K1	
100	

Evaluation	
Assessment Tool	Weight
First Exam	30%
Second Exam	30%
Final Exam	40%

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