



Department of Mathematics

College of Science

Salahaddin University-Erbil

Subject: Numerical Analysis I with MATLAB

Course Book : Third year (First Course)

Lecturer's name: Fuad W. Khdhr

Academic Year: 2022-2023

<p>Numerical Analysis and some of the major issues involved, including accuracy and convergence, through the study of some simple numerical algorithms. Therefore introduce students to Matlab programme and the use it with the topic of numerical analysis, because many of times calculation of the problem by hands is difficult. Finally to learn how to apply numerical methods to a variety of physical problems.</p>	
<p>12. Student's obligation</p> <ol style="list-style-type: none"> Students must come on time and remain in the classroom for the duration of scheduled classes and Labs. Students own an obligation to write tests and final examinations at the times scheduled by the teacher or the College. 	
<p>13. Forms of teaching</p> <p>I give hard copy of My lecture notes to students before coming lecturer time. first I remember students about previous lecture, and then I start new lecture. At the end of the lecture give a homework for the next lecture. During this proses I am use presentation and whiteboard.</p>	
<p>14. Assessment scheme</p> <ol style="list-style-type: none"> <i>Practical</i>: 35% Matlab assignments and quizzes in Lab. <i>Theoretical</i>: 15% (Midterm exams and other activities). <i>Final Exam: Theoretical</i>: 50% . 	
<p>15. Student learning outcome:</p> <ol style="list-style-type: none"> Students will be learn to concept of Numerical analysis and type of errors. Students will be learn to find out approximate root of linear and non-linear of equations and systems by different methods. Students will be learn to interpolate and least square of polynomial. Students will be learn to Numerical Differentiation and integration. Students will be learn to Numerical Solution of Ordinary Differential Equations. 	
<p>16. Course Reading List and References:</p> <ol style="list-style-type: none"> [1] Saeed, R. k., Jwamer, K. H., Hamasalh F. K. (2015) "Introduction to Numerical Analysis, First Edition", Sulaimani, Kurdistan Region – Iraq. [2] Burden, R. L. and Faires, J. D. (2011) "Numerical Analysis, Ninth Edition", Prindle, Weber and Schmidt. [3] Kincaid, D. and Cheney, W. (2002) "Numerical Analysis: mathematics of Scientific computing, third edition", Brooks/Cole Publishing Company. [4] Phillips, G. M. and Taylor, P. J. (1973) "Theory and applications of Numerical Analysis", New York: Academic Press. [5] Ralston, A. and Rabinowitz, P. (1978) "A First course in Numerical Analysis", New York: McGraw-Hill. 	
17. The Topics:	Lecturer's name

<p>First Course Chapter One: Introduction Numerical Analysis: The concepts of Floating-point numbers and round off errors. Errors: Sources of error in numerical computation. Absolute and relative errors.</p> <p>Chapter Two: Solution of Nonlinear equations Review of the following methods { Graphical Method, Bisection Method, False-position, Secant methods, Newton-Raphson, Fixed points iteration. Order of convergence.</p> <p>Chapter Three: Solving systems of linear Equations Vector norm, Matrix norm</p>	<p>14 week (2 hours)</p>
<p>18. Practical Topics</p>	
<p>Chapter One: Introduction To Matlab. Chapter Two: Some important Commands of Matlab (Matrices and there properties, Polynomials, Plots and Graphics) Chapter Three: Some basic Concepts of Matlab program scripts and functions). Chapter Four: Coding Topics of methods in Numerical Analysis. (all methods in theoretical parts) 4.1:- Solution of Nonlinear equations</p>	<p>14 week (2 hours)</p>
<p>19. Examinations: Questions in the examination will be arranged the matching mode by way of the examples and exercises that I give delivered in the lecture notes. Sometimes will be have extra mark in examination for worthy students. Many of the questions will be taken from this book: Thomas, Burden, R. L. and Faires, J. D. (2011) "Numerical Analysis, Ninth Edition", Prindle, Weber and Schmidt.</p>	
<p>20. Extra notes: Answers of examination will be find in the board's declaration mathematics department after every examination.</p>	