

1. Course Name:					
Engineering and Numerical Analysis					
2. Course Code:					
CIV31202					
3. Semester / Year:					
First Semester-Third Stage					
4. Description Preparation Date:					
9-12-2025					
5. Available Attendance Forms:					
6. Number of Credit Hours (Total) / Number of Units (Total) : 5					
7. Course administrator's name (mention all, if more than one name)					
M.M. Makarim Noori Ali					
8. Course Objectives					
Course Objectives	1- The lecture aims to improve student mathematical literacy and communication skills. they should be able to read and interpret mathematical notation, formula and graph. 2- The math. Lecture aims to develop students thinking and solving problems, through mathematical exercises and application. Students should be able to analyze engineering problems. 3- Familiarize with differential equations, series and complex function, they play a crucial role in civil engineering particularly in structural analysis and linear systems.				
9. Teaching and Learning Strategies					
Strategy	The main strategy that will be adopted in delivering this module is to encourage students participation in the exercises, while at the same time refining and expanding their critical thinking skills, this will be achieved through class and interactive tutorials by considering types of simple experiment involving so sampling activities that are interesting to the students.				
1. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	Understanding and learning theories and methods used in solving using numerical methods	Introduction a sequence is an ordered list of numbers.	Theoretical	Several ways (exam, quiz, homework)

2	5	Ability to analyse, evaluate, and expand mathematical equations using appropriate numerical methods	Geometric series and power series	Theoretical	Several ways (exam, quizzes, home work)
3	5	Student should understand the concept of Taylor series by methods	Taylor and Maclaurin series	Theoretical	Several ways (exam, quizzes, home work)
4	5	Student should understand the concept of Taylor series by methods	Taylor and Maclaurin series	Theoretical	Several ways (exam, quizzes, home work)
5	5	Student should understand the concept of Taylor series by two methods	Application of Taylor and Maclaurin series	Theoretical	Several ways (exam, quizzes, home work)
6	5	Student should understand the concept of interpolation	Interpolation	Theoretical	Several ways (exam, quizzes, home work)
7	5	Student should understand the concept of interpolation	Interpolation	Theoretical	Several ways (exam, quizzes, home work)
8	5	Student should understand the concept of least square methods	Approximation least square method	Theoretical	Several ways (exam, quizzes, home work)
9	5	Student should understand the concept of least square methods	Approximation least square method	Theoretical	Several ways (exam, quizzes, home work)
10	5	Student should understand the concept of simultaneous methods	Solution of simultaneous linear equation	Theoretical	Several ways (exam, quizzes, home work)
11	5	Student should understand the concept of eigen methods	Eigen value problems	Theoretical	Several ways (exam, quizzes, home work)
12	5	Student should understand the concept of differential equation	Numerical differential equations	Theoretical	Several ways (exam, quizzes, home work)
13	5	Student should understand the concept of differential equation ODE	Numerical solution of ODE	Theoretical	Several ways (exam, quizzes, home work)
14	5	Student should understand the concept of differential equation ODE	Numerical solution of ODE	Theoretical	Several ways (exam, quizzes, home work)
15	5		Final Exam		

2. Course Evaluation

3. Learning and Teaching Resources

Required textbooks (curricular books any)	Numerical Methods by R.W. Hown Book Basic Numerical Methods by R.E. Sowaton
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Main references (sources)	Numerical Methods by R.W. Hown Book Basic Numerical Methods by R.E. Sowaton
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form