Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
INF325	Numerical Analysis	6	3	0	0	3	4

Prerequisites	ING207
Admission Requirements	ING207

Language of Instruction	
Course Type	Compulsory
Course Level	Bachelor Degree
Objective	This course, which is offered as a compulsory course to Computer Engineering students, introduces students to solution techniques for numerical problems. Like this; Students will gain basic knowledge and skills for numerical solution of the problems they will encounter both in business life and during their academic careers. In this context, we can list the objectives of this course as follows: To students; Giving ideas about numerical analysis problems, To provide general information about the scope and difficulties of numerical analysis problems, To provide basic knowledge about solution techniques of numerical analysis problems, To provide students with the ability to apply complex numerical analysis, solving techniques and typesetting operations.
Content	Week 1 Fixed point, floating point arithmetic, IEEE 754 standard Week 2 Introduction to Python 3.0 programming language Week 3 Linear system equations Week 4 LU, Cholesky, Crout, Doolitle matrix decomposition methods Week 5 Interpolation, Extrapolation, Line Estimation Week 6 Polynomial Interpolation, Cubic Splines and Least Squares Method Week 7 Linear equation solutions 8th Week Midterm Exam Week 9 Bisection, Newton Raphson Method Week 10 Numerical Differentiation-Richardson Extrapolation Week 11 Numerical Integral Week 12 Newton Cotes Method, Gauss Integral, Multiple Integral Solutions Week 13 Initial Value Problems Week 14 Euler, Second and Fourth Order Runge-Kutta Solutions
References	1- Numerical Methods in Engineering with Python 3, Jaan Kiusalaas, Cambridge University Press, 2013 2- Learning Python, Fifth Edition, Mark Lutz, O'Reilly, 2013 3- Scipy and Numpy, Eli Bressert, O'Reilly, 2012

Theory Topics

Week	Weekly Contents
1	Introduction to analysis
2	Introduction to programming with MATLAB
3	Solution of nonlinear equations
4	Newton and Bisection Methods
5	Solution of the linear equation systems
6	LU factorization

Week	Weekly Contents
7	Jacobi & Gauss-Seidel Iterative Approaches
8	Curve fitting and interpolation
9	Least square method
10	Midterm
11	Numerical Derivation
12	Taylor series expansion
13	Numerical integration
14	Trapezoidal & Simpson Methods