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# Calcolo numerico A

## Programma

Initial-Value Problems in Ordinary Differential Equations. One-step Methods.  
Polynomial Interpolation.  
Multi-step Methods. Stability, Instability- Stiff Equations.  
The Finite Difference Method for Linear Problems.  
Solution of Systems of Linear Equations. Ill-conditioning and Error Analysis.  
The Algebraic Eigenvalues Problem. Localization of eigenvalues. The Power Method.  
Transformation method.  
Solution of Non-linear Equations in a Single Variable.  
Solution of Systems of Non-linear Equations.  
Finite Difference Methods for Non-linear Boundary- Value Problems.  
Spline and Least-Squares Approximation.  
Numerical Integration.  
Partial Differential Equations. Explicit Methods and the Stability Problem.  
Implicit Methods. Semi-discrete Methods.

## Attività d'esercitazione

Language of Technical Computing : MATLAB

## Modalità d'esame

Written.

## Testi consigliati

G. Monegato, Fondamenti di Calcolo Numerico, CLUT.  
A. Quarteroni, R. Sacco, F. Saleri, Matematica Numerica, Springer.  
James M. Ortega and William G. Poole, An Introduction to Numerical Methods for Differential Equations. Pitman Publishing INC., Massachusetts, US