Politecnico di Torino

Academic Year 2010/11 (first time established in A.Y.2007/08)

01GRFJA

Numerical methods

1st degree and Bachelor-level of the Bologna process in Electronic And Computer Engineering - Vercelli (III FACOLTA' DI INGEGNERIA)

Teacher	Status	SSD	Les	Ex	Lab	Years Stability
Puppo Gabriella	AC	MAT/08	3	2	0	1

SSD	CFU	Activities	Area context
MAT/08	5	A - Di base	Matematica, informatica e statistica

Objectives of the course

The aim of the course is to provide a basic knowledge of the main numerical computing techniques, with particular emphasis on a competent use of existing algorithms.

Expected skills

The student is expected to be able to learn how to use commercial software to solve basic computing problems, writing simple codes and providing a critical assessment of the quality of the results obtained.

Prerequisites

Calculus 1 and 2, Linear Algebra.

Syllabus

1. Computer arithmetic
2. Condition number of a problem
3. Linear algebraic systems of equations
1. Direct methods
2. Iterative methods for large sparse systems
4. Computing Eigenvalues
5. Approximation of data and functions
6. Quadrature
7. Solving non linear systems of equations
8. Integration of ordinary differential equations

Laboratories and/or exercises

The Lab session will concentrate on a comparative study of the algorithms presented in class, illustrating their performance and weaknesses on several test cases.

Bibliography

Main text
Numerical mathematics, A. Quarteroni, R. Sacco, F. Saleri, Springer 2006.
Matlab reference
Matlab Guide, J. Higham, N. Higham, SIAM 2005.

Revisions / Exam

Oral exam, based on a discussion of the algorithms studied in class, and of the results of a project, assigned during the current academic year.

Programma definitivo per l'A.A.2010/11

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