UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Methods of Scientific Computing

2526-1-F1802Q105

Aims

The aim of the course is to present in a rigorous way some fundamental numerical algorithms for mathematical modeling and to learn how to find and use scientific software libraries for the solution of concrete problems.

Contents

Floating-Point Arithmetic.

Numerical linear algebra: solution of large sparse linear systems, eigenvalue problem.

Google search algorithm.

Continuous and discrete Fourier Analysis.

Detailed program

1. Mathematical modeling
2. Floating-Point Arithmetic
3. Numerical Linear Algebra: Direct and Iterative Methods for Linear Systems
4. Eigenvalues Algorithms and Google Search Algorithm
5. Fourier Analysis
6. Discrete Cosine Transform (DCT)
7. JPEG file format for compressed images
8. Fast Fourier Transform (FFT) (outline)

Prerequisites

Math courses of the Bachelor in Computer Science.

Teaching form

The activities are: 32 hours of frontal lectures in erogative mode and 20 hours of exercise classes in interactive mode.

Textbook and teaching resource

Teacher's notes available on the web page of the course and books on demand.

Semester

2?? Semester.

Assessment method

During the course the teacher will assign two (or more) projects, to be retuned 3 days before the final exam. The final exam consists in the presentation of the projects and a discussion.

Office hours

Email appointment.

Sustainable Development Goals