UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Methods of Scientific Computing

2627-1-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: direct and iterative solution of large sparse linear systems.

Eigenvalue problem and 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

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 in presence.

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, two or more written reports will be assigned and must be submitted before the exam. The exam consists of a presentation of the reports and a discussion of their content. Alternatively, or in the event of withdrawal from or failure of the project-based exam, the exam will consist of a standard oral examination covering the course topics.

Office hours

Email appointment.

Sustainable Development Goals

QUALITY EDUCATION