

Numerical Analysis - Applied Mathematics



Prof. Gianluigi Rozza <grozza@sissa.it>,
Dr. Michele Girfoglio <mgirfogl@sissa.it>
Mr. Pierfrancesco Siena <psiena@sissa.it>

SISSA International School for Advanced Studies,
MathLab, Mathematics Area,
Trieste, Italy

Target Audience:

- SISSA PhD Students with little or no background in Numerical Analysis
- Laurea Magistrale in Matematica (II year)
- Laurea Magistrale in Data Science and Scientific Computing (I year)

Rough program of the course:

- Basics (basic definitions, stability, convergence, well posedness, etc.)
- Interpolation (Lagrange polynomials, Bernstein Polynomials, etc.)
- Integration (L2 projections, interpolatory quadrature formulas, Gauss q.f., etc.)
- Numerical linear algebra (direct and iterative solvers, least squares, eigenvalues/eigenvectors)
- Introduction to ODEs (explicit and implicit methods, a-stability, etc.)
- Introduction to PDEs (intro to finite differences, finite elements, etc.)
- ...and all of the above in PYTHON

Exam modality

- Oral + optional python project Lasts usually 1 hour per student (or less):
 - Optional Python Project with deadline one day before the oral exam (REQUIRED for 30/30 cum Laude)
 - One open question with time to think (and write) (about 20 min) on one of the main topic of the course
 - (optional) discussion of the python project (if done by the student) (usually around 10 min)
 - Free questions inspired by answers to open question, or by python project (usually around 20-30 min)
 - Maximum mark without Python project: 28/30

Lessons

- The Course is in presence. If you need to follow remotely:
[lessons-link](#)
- Recording of lectures from 2020-2021
[recorded-lessons-20-21](#)

Lectures (Prof. Rozza and M. Girfoglio):

- Tuesdays: 4 - 6 pm @SISSA room 005
- Thursdays: 4 - 6 pm @SISSA room 005

Everything is shown in the page:

page-of-the-course

Optional Hours (Mr. Pierfrancesco Siena <psiena@sissa.it>):
exercices (TO BE DEFINED)