

EOAS 213 - Computational Methods for Geological Engineers

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1 Approximate Syllabus

Week 1 Introduction to scientific computing and test cases

Week 2 Differentiation - Finite difference in 1D

Week 3 Differentiation - Finite difference in 2D

Week 4 Solving Poisson Equation in one and 2D

Week 5 Particle flow

Week 6-7 Interpolation

Week 8-9 Data fitting and optimization

Week 10 Introduction to machine learning

Week 11-14 Student Projects and presentations

2 Resources

- Notes and Jupyter notebooks to be supplied
- A First Course in Numerical Methods, Ascher & Greif
- PyTorch

3 Examples and Codes

We will be using Jupyter notebooks through google colab. Please make sure you have a google account and that you can run a google colab notebook.

The notebooks are written in python and we will learn some basic python throughout the course.

4 Assignments and Grading

Every week or two a homework assignment will be given. Some will be for you to practice (I will not grade then and they will be completion only) and some will be graded (typically, the ones require more thought and work.)

There will be two midterms and a final. Gradient is as follows

- Homework - 30%
- Midterm - 30%
- Final 40%.

You must pass the final to pass the course!

5 Office hours

Lectures are given TT 12:30 PM to 2:00 on Zoom. I will stay online every time for questions or any problems you may have. If you need extra time we can communicate by email. Please email me to

`eldadHaber@gmail.com`