

Modeling and Simulation

The course focuses on providing knowledge and understanding on the numerical simulation workflow from the first step „the conception“ of the problem through to the final step of „Post-processing results“. Course will include lectures for the theoretical content which will be followed by hands on exercises. The hands on exercises will include guided/instructed formulation and/or development of methodologies required for each step of the modeling and simulation pipeline.

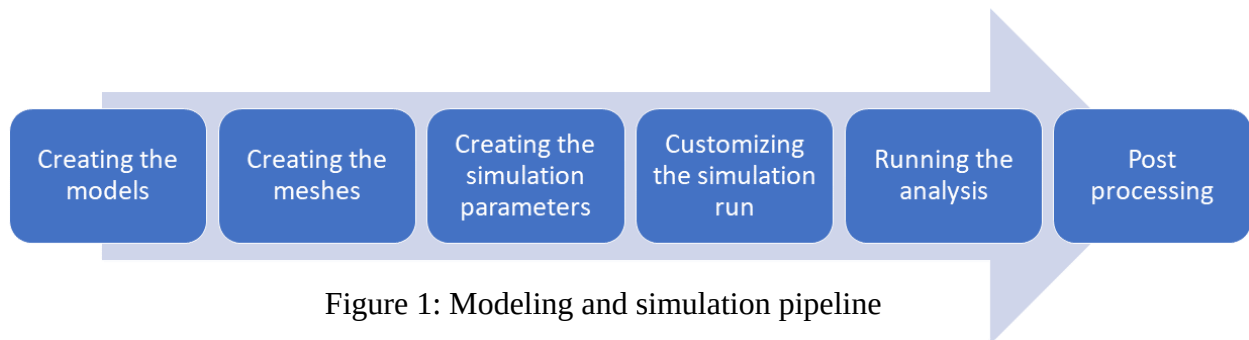


Figure 1: Modeling and simulation pipeline

Evaluation criteria:

There will be a final project preparation, report and presentation as an evaluation at the end of the course (examination style: Portfolio).

Course duration:

The course runs through summer semester and winter semester each year. Each semester course consists of 3 credits (all-together 6 credits) worth of work load. Most of the work will be done within the class allocated time on every Monday from 3 pm – 7 pm (from 17th April 2023 – 17th July 2023 in summer semester, winter semester dates will be announced later and the contents of the winter course are subjected to change based on the feedback and/or discussions).

Course content:

- Introduction to modeling and simulation.
- Introduction to GUI-based modeling and simulation pipeline (realized by GiD).
- Introduction to scripting based modeling and simulation pipeline (realized by python).
- Introduction to FEM software based modeling and simulation pipeline (realized by open source Kratos-Multiphysics framework using python scripting).
- Introduction to FEM software based modeling and simulation pipeline with basics in C++ for FEM (realized by open source Kratos-Multiphysics framework).

Previous knowledge expected:

Sound knowledge in mathematics and numerical methods. Basic knowledge in programming.

Language of instruction: English

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