

Advanced FEM (including handling of non-linear problems)

Postgraduate course, 10 hp

Course material

TJR Hughes. The Finite Element Method – Linear static and dynamic finite element analysis
C Johnson. Numerical Solution of Partial Differential Equations by the Finite Element Method
Belytschko, Liu & Moran. Nonlinear Finite Elements for Continua and Structures

Lecturer/Coordinator

Carl-Johan Thore and Daniel Leidermark

Examiner

Daniel Leidermark

Start

September 2019

Outline

First part. Linear FEM

- This part of the course consists of 10-16 2-hours lectures.
- Students should hand in written assignments for each lecture.
- Literature is Hughes and Johnson.

Second part. Non-linear FEM

- This part of the course will use seminar sessions, where the following chapters will be reviewed: Belytschko: (notation 1), 4, 5, 6, 7 and 10
- A session leader presents the chapter in question under the seminar and its content is discussed within the group.
- The role of session leader alternates between each of the participants.
- Seminar intervals according to your own planning within the course. Book rooms, schedule the sessions and distribute to everyone and Daniel as well.
- Five assignments are to be conducted and examined.
- No final deadline is present for handing in the assignments.
- If you cannot participate during a scheduled session, you are to write a one-pager about that surveyed chapter and distribute to all participants, who will then give comments on it.

Certificate of course completion will be distributed if asked for.

Schedule

Precise schedule for the first part will be decided in Fall 2019, but the plan is to have one 2-hour lecture per week.

The plan for the second part is six seminars with approximately two weeks in between. The session leader books room for each occasion. Preliminary Chapter assignment/session leader:

1. Belytschko 4: X1
2. Belytschko 5-5.6: X2
3. Belytschko 5.7-5.10: X3
4. Belytschko 6: X4
5. Belytschko 7: X5
6. Belytschko 10: X6