Course analysis report – FAF3212 - 2020-10-25

Please note that there is only one respondent to this form: the person that performs the course analysis.

Course analysis carried out by (name, e-mail):
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DESCRIPTION OF THE COURSE EVALUATION PROCESS Describe the course evaluation process. Describe how all students have been given the possibility to give their opinions on the course. Describe how aspects regarding gender, and disabled students are investigated.
10 among 15 participants filled a survey.

DESCRIPTION OF MEETINGS WITH STUDENTS Describe which meetings that has been arranged with students during the course and after its completion. (The outcomes of these meetings should be reported under 7, below.)
See above.

COURSE DESIGN Briefly describe the course design (learning activities, examinations) and any changes that have been implemented since the last course offering.
The purpose of this course is to give engineers, scientists and researchers a deeper insight into the finite element method with an emphasis on methodologies and applications for non-linear problems. The fundamental theoretical background, the computer implementations of various techniques and modeling strategies will be treated. Both geometrical and material non-linearities will be addressed. The examination consists of homeworks and an oral exam. The course is given every four years.

THE STUDENTS' WORKLOAD Does the students' workload correspond to the expected level (40 hours/1.5 credits)? If these is a significant deviation from the expected, what can be the reason?
Some students reported that the homeworks required too much works for 7.5 credits. I agree with that.

THE STUDENTS' RESULTS How well have the students succeeded on the course? If there are significant differences compared to previous course offerings, what can be the reason?
12 of 15 students passed the course. 3 students gave up.

STUDENTS´ANSWERS TO OPEN QUESTIONS What does students say in response to the open questions?
Students are generally very happy with the course, as it was a completely new topic for most of them. Most of the students thought that the lectures were interesting and that the homeworks helped them to understand the theory.

SUMMARY OF STUDENTS' OPINIONS Summarize the outcome of the questionnaire, as well as opinions emerging at meetings with students.
See the summary of the student survey below.

OVERALL IMPRESSION Summarize the teachers' overall impressions of the course offering in relation to students' results and their evaluation of the course, as well as in relation to the changes implemented since last course offering.
We think that the course went very well. The students who passed the course have shown at the oral exam that they understood the key concepts. However, the amount of homeworks should be reduced.

ANALYSIS Is it possible to identify stronger and weaker areas in the learning environment based on the information you have gathered during the evaluation and analysis process? What can the reason for these be? Are there significant difference in experience between:- students identifying as female and male?- international and national students?- students with or without disabilities?
Too few students to make this detailed analysis.

PRIORITIZED COURSE DEVELOPMENT What aspects of the course should be developed primarily? How can these aspects be developed in short and long term?
the amount of homeworks should be reduced.

OTHER INFORMATIONIs there anything else you would like to add?
N/A.

FAF3212 – Non-linear FEM for Civil Engineers – Survey

	How interesting was the lecture ? 1 not interesting 5 very interesting	How relevant was the lecture for your work ? 1 not relevant 5 very relevant
Lec 1: Introduction, N-R method	1 2 3**(1)** 4**(5)** 5**(4)**	1 2 3**(2)** 4**(5)** 5**(3)**
Lec 2: Different strain measures, Non-linear 2D truss elements	1 2 3 4**(6)** 5**(4)**	1 2**(1)** 3**(4)** 4**(2)** 5**(2)**
Lec 3: Path-following procedures, Convergence criteria	1 2 3 4**(5)** 5**(5)**	1 2 3**(3)** 4**(5)** 5**(2)**
Lec 4: Non-linear 2D beam elements	1 2 3 4**(6)** 5**(4)**	1 2**(1)** 3**(4)** 4**(4)** 5**(1)**
Lec 5: Basic plasticity 1D, Implementation in a beam element	1 2 3**(1)** 4**(4)** 5**(5)**	1 2 3**(3)** 4**(4)** 5**(3)**
Lec 6: Non-linear 2D isoparametric element	1 2 3 4**(5)** 5**(5)**	1 2 3**(1)** 4**(6)** 5**(2)**
Lec 7: Basic plasticity 2D, Implementation in a plane element	1 2 3 4**(4)** 5**(6)**	1 2 3**(2)** 4**(2)** 5**(4)**
Lec 8: Continuum mechanics	1 2 3**(2)** 4**(4)** 5**(4)**	1 2 3**(2)** 4**(6)** 5**(2)**
Lec 9: Stability analyses	1 2 3**(1)** 4**(3)** 5**(6)**	1 2**(2)** 3**(5)** 4**(3)** 5
Lec 10: Non-linear dynamic analyses	1 2 3**(1)** 4**(6)** 5**(3)**	1 2**(1)** 3**(4)** 4**(4)** 5**(1)**
Lec 11: Non-linear 3D beam and shell elements	1 2 3 4**(8)** 5**(2)**	1 2**(1)** 3**(6)** 4**(3)** 5
Lec 12: Non-linear modelling of concrete structures	1 2 3**(1)** 4**(6)** 5**(3)**	1 2**(2)** 3**(1)** 4**(1)** 5**(6)**
Lec 13: Non-linear concrete structures – Practical applications	1 2 3**(1)** 4**(5)** 5**(4)**	1**(1)** 2**(1)** 3**(2)** 4 5**(6)**

How relevant were the homeworks in helping you understanding the theory:

1 (not relevant) 2 3 4**(2)** 5 (very relevant)**(6)**

Any comments:

Lecture 12 was very comprehensive. An alternative layout could perhaps be to cover a bit less, and going a bit more into detail in some parts of the lecture. Parts of 12d about elements were for example covered already in earlier lectures.

The only examination at KTH where I learned something

7.5 credits not enough for the course
Additional Homework related with reinforced concrete beam and additional homework related with dynamic analysis

Overall I think it was a great course. I would say that it is unfortunate that the content of this course is not given in the master program structural engineering (at least not at Chalmers). I

worked as a Structural engineer for 3 years before I started my PhD and most of the subjects covered in the course should, in my opinion, be basic knowledge for a structural engineer working with finite element models. It's easier to find the content relevant for applied engineering than for a specific research project and that's probably why my grading of relevance is lower than my grading of interest.
For the continuum mechanics, I think the level was set to high. The concept of tensor operations are difficult to grasp if you have a civil engineering background so it would probably be good if this subject was covered from an even more basic level.

I mostly work with material non-linearity (concrete) mostly with solid elements and thus find those parts most interesting and relevant for my work. Overall very good and interesting course and I also think that the homework and exam helped me with learning and understanding the contents of the course.