



Applied Finite Element Methods, 5.0 c

Course code: 1TD056, Report code: 12006, 33%, DAG, NML, week: 43 - 02 Semester: Autumn 2016

Result

This evaluation is answered by 65% (30/46) of the respondents.

Please write summaries of the free-text responses for each question before you publish. Work with the course report will be facilitated if you have already written the summaries. Please note that free text responses must be examined through a privacy perspective before they are published or printed. See [guidelines for course evaluations](#).

Welcome

Your views on the course is an important part of the course development. We hope you can give us feedback on things that should be developed and improved as well as things that works well and should be kept as it is. Concrete suggestions for improvement are very welcome.

Thanks for your help!

/Murtazo och Hanna

General Aspects

1: Which study program (or equivalent) are you registered on?

Answers: 30

Answer options:

0. Do not know/not relevant/do not wish to answer	0 responses	0%	
1. Civil Engineering, Engineering Physics (F)	22 responses	73%	
2. Master Programme in Computational Science	6 responses	20%	
3. Single Subject Course	2 responses	7%	
4. Other programme	0 responses	0%	

2: What is your general view about the course?

Answers: 30

Answer options:

Median: 4 Mean: 4.0 / 5





0. Do not know/not relevant/do not wish to answer	0 responses	0%	
1. Very bad	0 responses	0%	
2.	1 responses	3%	
3.	7 responses	23%	
4.	13 responses	43%	
5. Very good	9 responses	30%	

3: What was the degree of difficulty

Answers: 30

Answer options:

Median: 4 Mean: 3.8 / 5




0. Do not know/not relevant/do not wish to answer	0 responses	0%	
1. Very easy	0 responses	0%	
2.	2 responses	7%	
3.	7 responses	23%	
4.	16 responses	53%	
5. Very hard	5 responses	17%	

4: How did the total amount of work on the course relate to the credits?

Answers: 29

Answer options:

Median: 4 Mean: 4.0 / 5





0. Do not know/not relevant/do not wish to answer	0 responses	0%	
1. Very low	0 responses	0%	
2.	0 responses	0%	
3.	10 responses	33%	
4.	8 responses	27%	
5. Very high	11 responses	37%	

5: Is the course relevant to your education?

Answers: 30

Answer options:

Median: 5 Mean: 4.6 / 5





0. Do not know/not relevant/do not wish to answer	1 responses	3%	
1. Not at all	0 responses	0%	
2.	0 responses	0%	
3.	1 responses	3%	
4.	10 responses	33%	
5. To a very high extent	18 responses	60%	

6: Has the course been interesting and meaningful?

Answers: 29

Answer options:

Median: 5 Mean: 4.3 / 5





0. Do not know/not relevant/do not wish to answer	0 responses	0%	
1. Not at all	0 responses	0%	
2.	1 responses	3%	
3.	4 responses	13%	
4.	9 responses	30%	
5. To a very high extent	15 responses	50%	

7: Was your prior knowledge good enough for the course?

Answers: 30

Answer options:

Median: 5 Mean: 4.2 / 5

0. Do not know/not relevant/do not wish to answer	0 responses	0%	
1. No, not at all	0 responses	0%	
2.	3 responses	10%	
3.	3 responses	10%	
4.	8 responses	27%	
5. Yes, absolutely	16 responses	53%	

8: General comments on the course, e.g. something that was particularly good or something that should be improved?

Answers: 13

I think the project assignment could be looked over a bit, for instance it was not clear if you wanted homogenous bc on the first part of the second assignment or not. (it wasn't homogenous but it seemed like you meant it from other stuff you wrote). The FENICS stuff was quite difficult, since we don't have any python experience and the instructions were for the older fenics version. Also it's weird to not have exam solutions and some exam problems on the prior exams that haven't been dealt with in the lectures or lessons. I understand that we are supposed to learn on our own and think independently, but an exam isn't the real world so the preparation shouldn't be real world-esque, especially when we aren't allowed to bring real world stuff to the exam. I understand the most usual real world tool, a computer with internet and google can't be allowed, but if we can't even bring mathematics handbook the preparation should also be made easier. Otherwise it's just some weird way of looking at what we can memorize rather than understand, and then the exam does not reflect how good we would be at going this kind of things in reality, which an advanced level course clearly should be.

I really felt like the lesson on each part should be before the lab. That way we can bring some knowledge into the lab and start working directly as opposed to trying to figure out what was going on.

Bra föreläsningar och material. Man kan kanske lägga upp lektionsanteckningar men boken är annars bra!

The projects were good but the information about the labs and project were poor. specially how to install Fenics.

One lecture should have been dedicated to MATLAB implementation. There is a big step from theory to implementation that needs to be bridged. A lot of time was spend knowing what to do but struggling to implement it.

You really should set up some more guidelines for how to start the last fenics project, if you even can make it work in windows, a guide or at least some general insight into installing it would be very good. Also since fenics was outdated on the unix computers it was very difficult to find documentation for how certain functions worked two years ago.

Intressant och roligt ämne, föreläsningarna och lektionerna var bra och kändes relevanta.

Hard course but good. Hanna and Murtazo were both great.

I really like that the course has a higher focus on application rather than theory. Can be even more applied!

For me it is very inefficient to do exercises in class (too much noise etc), and I work much more efficient at home. Therefore I prefer lessons where the teacher present and discuss "typical" problems. I would recommend something like an office hour once a week, where students can get individual help on calculation excercises and/or maybe letting the last 10 minutes of the lesson be reserved for questions.

This was one of the best classes I've ever taken. The teachers were excellent, the subject was interesting and the project was really fun and taught me a lot.

I think that the project is laid out in a nice progressive, educational way. The explanations of methods and concepts throughout the course are very clear, perhaps a little repetitive sometimes. This is good in the sense that it helps to set up a solid knowledge, but also bad since it takes time from other things such as viewing more complicated parts with more detail.

It should be added more lab lessons, especially for the FEniCs.

Teaching





Main Teacher: Murtazo Nazarov

9: The teacher has been supportive in your learning process, e.g. good feedback, good explanations, clear and well structured teaching?

Answers: 30

Answer options:

Median: 4 Mean: 4.1 / 5

0. Do not know/not relevant/do not wish to answer	2 responses	7%	
1. Very little	0 responses	0%	
2.	0 responses	0%	
3.	7 responses	23%	
4.	12 responses	40%	
5. Very much	9 responses	30%	

Due to scheduling conflicts I wasn't able to attend a lot of the lectures, but from those few lectures my impression of him as a teacher is very good. Clear, straightforward lecturing style with attention to mathematical rigour.

The hopping around on the blackboard was sometimes quite frustrating and confusing

Sent an email asking for help with installing FEniCS that I didn't even receive an answer to, that was really annoying.

The feedback on the project was not so detailed.

At first your lectures came through as somewhat unstructured, but it became clearer throughout the course. You have a good pedagogic way of teaching, make sure to stick to an initial plan and complete an example/proof before continuing.

Murtazo's lectures have been very well structured and easy to follow, I very seldom felt confused during his lectures. I learnt a lot during the lectures.

sense of humor, good knowledge basis but seems not get prepared well before each lesson






Main Teacher: Hanna Holmgren

10: The teacher has been supportive in your learning process, e.g. good feedback, good explanations, clear and well structured teaching?

Answers: 30

Answer options:

Median: 5 Mean: 4.6 / 5

0. Do not know/not relevant/do not wish to answer	1 responses	3%	
1. Not agree at all	1 responses	3%	
2.	0 responses	0%	
3.	1 responses	3%	
4.	5 responses	17%	
5. Fully agree	22 responses	73%	

I must say Hanna was one of the clearest lecturers I've ever had. She made complex ideas seem simple and was always helpful and patient if there were difficulties.

You have a wonderful way of taking things slow and pedagogic but still manage to complete rather difficult examples.

Hanna's lessons were very well paced and she explained everything in a way that made everything clear and easy to understand. She was also kind enough to devote a lot of time to helping me with the project, something I very much appreciated.

11: General comments on the teaching, e.g. something that was particularly good or something that should be improved? (Constructive suggestions are welcome).

Answers: 10

Hanna was an excellent teacher, definitely the best TA I've had at UU. Very clear presentations during the exercise sessions. Hanna was very accessible and helpful as well as encouraging. Her upbeat, cheerful demeanor was a big plus!

Both teachers were really good.

Mostly good. A very small annoyance is that Murtazo rubs things out a lot which is a little frustrating. It would be fine if I was using pencil I suppose.

Väldigt duktiga!

You are both very good and compliment each other perfectly.

Got help almost instantly when asked for, very appreciated.

I think Murtazo's and Hannas teaching styles complement each other very well. It was great fun taking this course and the lessons and lectures were really good.

Make us work even more early on in the course! It's hard, and people might complain, but it pays off in the end.

Murtazo is very knowledgeable. However the lecture pace must be reduced by ~10 - 15%! Hanna is a very pedagogical and helpful assistant. I hope she becomes a teacher in numerical methods! I was, in fact, on the verge to drop the course. However, Hanna's benevolent assistance made me complete the course. Additionally, the FEniCS lecture by Niclas Jansson was very inspiring.

The problem solving sessions are very well structured.

Learning activities







Different kinds of learning activities has been used throughout the course. Evaluate how valuable these activities has been for your learning.

12: To what extent has the lectures contributed to your learning?

Answers: 30

Answer options:

Median: 4 Mean: 4.0 / 5







0. Do not know/not relevant/do not wish to answer	1 responses	3%	
1. Not at all	1 responses	3%	
2.	1 responses	3%	
3.	5 responses	17%	
4.	12 responses	40%	
5. To a very high extent	10 responses	33%	

13: To what extent has the computer labs contributed to your learning?

Answers: 30

Answer options:

Median: 4 Mean: 3.3 / 5







0. Do not know/not relevant/do not wish to answer	3 responses	10%	
1. Not at all	4 responses	13%	
2.	3 responses	10%	
3.	6 responses	20%	
4.	9 responses	30%	
5. To a very high extent	5 responses	17%	

14: To what extent has the problem solving classes contributed to your learning?

Answers: 30

Answer options:

Median: 5 Mean: 4.3 / 5





0. Do not know/not relevant/do not wish to answer	2 responses	7%	
1. Not at all	1 responses	3%	
2.	3 responses	10%	
3.	2 responses	7%	
4.	4 responses	13%	
5. To a very high extent	18 responses	60%	

15: To what extent has the programming assignments (project) contributed to your learning?

Answers: 30

Answer options:

Median: 4 Mean: 4.2 / 5

0. Do not know/not relevant/do not wish to answer	0 responses	0%	
1. Not at all	1 responses	3%	
2.	0 responses	0%	
3.	5 responses	17%	
4.	11 responses	37%	
5. To a very high extent	13 responses	43%	

16: Comments related to learning activities

Answers: 8

In my estimation the course offered a "complete package" of classes, very nice.

The lectures and labs were not in right orders.

Alldeles för oklara instruktioner till inlämningsuppgifterna. Sades av Murtazo vara väldigt enkla, "klipp och klistra från boken", när de i själva verkar var väldigt svåra enligt mig.

Everything was good. Very hard but very good.

The project and lessons have been most important for me, where one actually has to perform the crafts oneself. Still, the lectures are definitely necessary! I though recommend to have more lectures placed in the beginning of the course. The course can otherwise deceptively be perceived as a soft course - when it actually is demanding and time consuming. It is better to discover this early on; later on it may be too late!

At times I felt that the labs were so similar to things we were to do in the project, that I just skipped doing the lab and went on to start with the project straight away instead.

Their synergy between them is good in general.

I have not participated in any of the scheduled activities.

Text books and course material






The text book *Larson, Mats G. and Bengzon, Fredrik: The Finite Element Method: Theory, Implementation and Applications* has been used in the course.

17: Has the text book been useful?

Answers: 30

Answer options:

Median: 4 Mean: 4.1 / 5






0. Do not know/not relevant/do not wish to answer	2 responses	7%	
1. No, not at all	0 responses	0%	
2.	4 responses	13%	
3.	2 responses	7%	
4.	10 responses	33%	
5. Yes, to a high degree	12 responses	40%	

18: Has handouts such as solutions to exercises were useful?

Answers: 30

Answer options:

Median: 4 Mean: 3.7 / 5

0. Do not know/not relevant/do not wish to answer	7 responses	23%	
1. No, not at all	3 responses	10%	
2.	0 responses	0%	
3.	7 responses	23%	
4.	5 responses	17%	
5. Yes, to a high degree	8 responses	27%	

19: Comments related to text books and course material

Answers: 12

Murtazo didn't use powerpoint slides which was very good. Unfortunately there were no lecture notes of any kind available; something would have been better than nothing.

It would be very good if the lecturer put some material on studentportalen.

Would be good with actual solutions for the labs instead of just answers.

The book was wrong sometimes which caused a bit of confusion but I tended to find that the lecture notes were sufficient for what we were doing.

The chose of the literature was not successful due to many errors.

It would be great if we received some notes from the lectures. The book is pretty good but makes all these mistakes. Would be great if the found mistakes was written om a list on studentportalen.

The other two text books: Numerical Solution of Partial Differential Equations by the Finite element method, and Computational Differential Equations was more helpful than the main course book, some parts of the main book was very confusing and errors caused were irritating. Although it was helpful with some assistance to implement code.

The solutions to the labs were really hard to understand, giving the code for how you did it would have been very nice. Or at least some more descriptions instead of some plain graphs.

Utän kursboken hade inlämningsuppgifterna varit snudd på omöjliga, då instruktionerna inte räckte till för mig.

it's good too. Good stuff!

Would have been nice to have the notes on studentportalen!

The solutions pdfs could be improved, the reasoning and explanations were not always clear.






Examination

20: Examinations accorded well with the content of the course.

Answers: 27

Answer options:

Median: 4 Mean: 3.9 / 5

0. Do not know/not relevant/do not wish to answer	15 responses	50%	
1. Do not agree at all	1 responses	3%	
2.	0 responses	0%	
3.	3 responses	10%	
4.	2 responses	7%	
5. Agree completely	5 responses	17%	

how are we to fill this out before the exam? Hopefully it's highly correlated with the course material....






Well I haven't taken the exam yet but I really hope it doesn't set unreasonable expectations on us students. Haha!

21: Examinations have given me fair opportunities to demonstrate my knowledge.

Answers: 27

Answer options:

Median: 4 Mean: 3.9 / 5

0. Do not know/not relevant/do not wish to answer	17 responses	57%	
1. Do not agree at all	1 responses	3%	
2.	0 responses	0%	
3.	2 responses	7%	
4.	2 responses	7%	
5. Agree completely	4 responses	13%	





Yes! Probably

22: What was the degree of difficulty of the examinations ?

Answers: 27

Answer options:

Median: 3 Mean: 3.3 / 5

0. Do not know/not relevant/do not wish to answer	19 responses	63%	
1. Very easy	0 responses	0%	
2.	1 responses	3%	
3.	4 responses	13%	
4.	3 responses	10%	
5. Very hard	0 responses	0%	

Just slightly irrelevant I'd say. The exam I mean.

I haven't taken the exam but the older exams look like they're fair

23: Comments related to examinations

Answers: 4

This is looking at older exams since we were supposed to do this survey before the new one

As I do this evaluation before the exam, my comments applies to the old exams on the home page.

The examination reflected the material and approaches taken in the course very well, it was very coherent with the course.

The calculations required by some exercises were long (e.g. integrals). Personally, I do not dislike this, but it is somehow tiring for the mind and you might feel so tired towards the end that you don't put so much thinking into the last questions.




Project

24: What was the degree of difficulty of the project?

Answers: 29

Answer options:

Median: 4 Mean: 4.2 / 5

0. Do not know/not relevant/do not wish to answer	0 responses	0%	
1. Very easy	0 responses	0%	
2.	0 responses	0%	
3.	3 responses	10%	
4.	17 responses	57%	
5. Very hard	9 responses	30%	

25: Comments about the project

Answers: 14

I thought they were heavy. Spent a lot of time on them.

The project was very enjoyable, and I liked very much that the course was so project-driven. Having a large "final project" that you build upon continually, rather than three disjoint assignments, was great and I think more courses should follow that recipe.

The guest lecture about FEniCS, though interesting, was not really helpful in finding out, how FEniCS is supposed to be worked with. I wish we would have had at least an introductory lesson on how it works (meaning this by knowing of Lab3, but that was basically just copy and paste and therefore not so helpful for understanding)

Quite challenging in a good way, but the fenics part should be worked on

It took quite a bit of time in the writing alone. Good to be doing though.

Very hard if we did not copy and paste the codes from the books

the project description needs some more information. They would be very hard to solve unless Hanna gave hints during the lessons. But if one missed one of those one would be totally screwed.

In project one and two the book helped a lot with coding and understanding the problem. However in project 3 that help didn't exist anymore.

As above, way harder than I think was intended. Unclear what was asked for and a lot of trial and error instead of clear instructions and goals. FEniCS was also hard to get started with, since it cannot(?) be installed in Windows. A lot of links about it leads to 404-pages, and the computers at ITC are often very slow and difficult to work with. Consider making a good guide for using FEniCS in Windows, if that is even possible, if it isn't possible, consider making it, or use another program for this project.

I gotta say, the assignments were rather hard. But I feel like I've learned so much and I think the assignments probably are the most important part of the course. But you really have to at least in my case, put in a lot of hours. It's with this just like any other hard subject if you put in enough time you'll manage. Who cares about friends and relationships or even family. I mean there's always FEM.

You learned a lot but it was very difficult to finish part C during the last week with all the final exams we have in other courses. The project is big and takes a lot of time. Please encourage the students to start early, without frightening them :)

The workload throughout the course have been very focused on the project. If this has been intentional, wonderful. If not, then the project might be too big.

Quite time consuming, but extremely valuable for the learning process.

I really liked working with the project. It really sparked an interest for finite element methods for me, and I feel like I learned a lot. However, I do feel that the FEniCS part could have had some more detailed instructions. What I struggled with the most during the third part of the project was just figuring out the syntax and such, and I felt that I could have benefited from some more instructions or tips on how to use FEniCS than what was given

in the lab and project description.

General comments

26: What is the best piece of advice you would give a student taking this course another time?

Answers: 13

Have someone to talk to. I mean yes --- it's satisfying to do everything by yourself, but I spent a lot of time just figuring out matlab, which is frustrating, given that the idea was already there. In instances like that I think a friend would have helped.

Learn the material and ignore the exam. Honestly, just make sure you understand this stuff and can derive everything and do it on a computer. Then you should pass the exam at least.

The projects delivery time should have been later, especially sometimes after the relevant lectures.

Attend the lectures and lessons!

Find and use the book.

Start with the project way earlier than you think is necessary.

Have fun!

Start with the labs and the project as early as possible. Go to all lectures and lessons, look through the material and use the book for the implementation parts of the course.

The course is more time consuming than one may think. Start as soon as possible to perform calculation exercises from the book - and attend all scheduled occasions! The labs are very important for the project - be there! And ask questions!

Don't hesitate to ask the teachers about stuff you're uncertain about, they will explain it to you and they will explain it in a way that you will understand.

Try to solve as much of the exercises as possible, it helps a lot to understand the theoretical material of the course.

Don't miss the lectures, listen to Murtazo & Hanna, start the project with time and ask questions during the labs.

Do each part of the project before the corresponding lab lesson to have enough time asking questions.

Summary of free-text responses/comments for the whole course evaluation

