



SAMMANSTÄLLNING AV KURSVÄRDERING FÖR SCIENTIFIC COMPUTING FOR PARTIAL DIFFERENTIAL EQUATIONS 1TD354 62003 VT2023 (1TD354 62003)

Sammanställd	
Antal svar	40 av 105 (svarsfrekvens 38 %)
Tillgänglig	2023-03-05 – 2023-03-26
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Kurs	Scientific Computing for Partial Differential Equations 1TD354 62003 VT2023 (1TD354 62003)

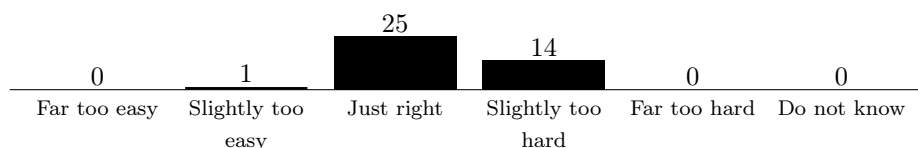
INFORMATION ABOUT SWEDISH TRANSLATION / INFORMATION PÅ SVENSKA OM FRÅGORNA

Om du behöver hjälp med översättning av dessa frågor till Svenska kan du klicka [här](#).

START OF QUESTIONS

Your viewpoints are valuable, and both positive comments and constructive and objective criticisms are welcome. Your criticism should be objective, constructive and always take into consideration individuals' integrity.

1. How would you rate the course's degree of difficulty? (Description: Here, you are asked how difficult you think the course was, taking its requirements and level into consideration. Feel free to comment on your answer.) ($Medel = 3,3$, $SD = 0,5$) ($1 = Far too easy$, $5 = Far too hard$)

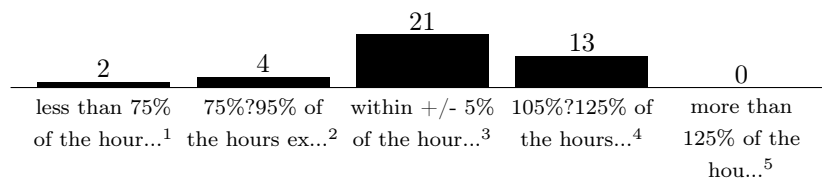


COMMENTS:

- The course covers a lot of things and while it is interesting it is hard to learn it all. [4]
- Kursen är riktigt svår! Det känns som att det inte riktigt gicks igenom från grunden vilket gjorde den 'onödigt' tung!! [4]
- The degree of difficulty of the course was just right in my opinion. The material was presented very gently from the beginning and throughout. [3]
- I found the course quite challenging, but this is something I'm very interested in and happy to put time into learning. [3]
- It was a difficult course, but at the same time the course should be difficult considering it is "advanced" and the third course in its area [3]



- Overall, the course was slightly too hard. The project in particular was very difficult. The rest of the course was just advanced. [4]
 - This entire course is just linear algebra, and linear algebra is pretty straightforward. It contains enough exercises and projects so you're really forced to learn everything in the lectures. And nothing comes out of nowhere. [3]
 - Some concepts such as SBP-SAT were very abstract and hard to grasp. [4]
 - The multi dimensional SBP-SAT was slightly too hard but the rest of the course material was on good degree of difficulty [4]
 - It was hard but not unreasonable [3]
 - I assume that participating more than I did and doing more exercise problems puts this course into the just right category. [3]
2. How did you perceive the course's workload in relation to its size (number of credits)? (Description: Here, you are asked how you perceived the workload, i.e. how much total time you invested in relation to full-time. Baseline: a 5-credit course given in a period of 10 weeks is expected to correspond to 1/3 of full-time, or 13.3 hours per week. Feel free to comment on your answer.)



¹ less than 75% of the hours expected
² 75%?95% of the hours expected
³ within +/- 5% of the hours expected
⁴ 105%?125% of the hours expected
⁵ more than 125% of the hours expected

COMMENTS:

- Projektet tog lång tid, men det var ju inte så mycket mer i kursen så rimligt
- The workload during the course was relatively high. Firstly, 15 lectures are a lot for a 5-credit course. The lectures did not contain too much material though. So, in that sense 15 lectures are not that much. What I mean is that I rather have more lectures were the material is gone through more properly rather than have fewer lectures were we students have to learn much of the material on our own.

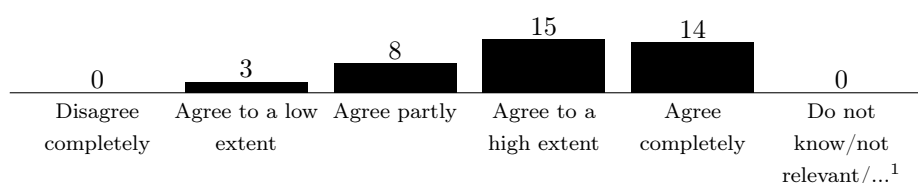
Secondly, the projects, especially project 1, were very time consuming. I had to devote more or less a whole week for project 1 alone. Project 2 was shorter than project 2, but it was not short. On the other hand, one learned more or less all the content of the course by simply doing the projects thoroughly. I wrote the exam earlier today, and I did not study that much in the traditional sense by doing old exams; I merely attended lecture 15, where the exam from 2022-10-24 were gone through, and did a few old exams problems, I had already learned most of the material I needed by doing the projects in a very complete manner. I must say that the exam went flawlessly. Looking at it from this perspective, I would say that the time it took to do the projects was a rewarding investment.

The computer labs were also fairly long, but they were indeed helpful for the programming segments of the projects.

- There were not much work needed to be done outside of lectures. The problem solving lessons were the only opportunity for solving problems on your own and during the projects.



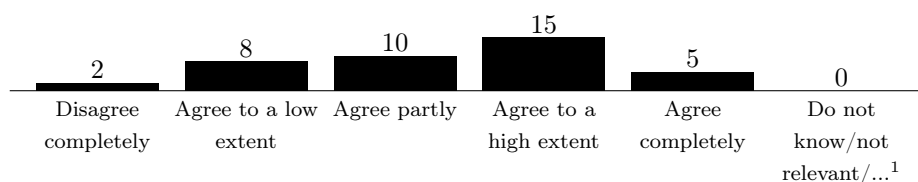
- Projekten tog orimligt lång tid
 - The lack of home exercises made most time spent with the course scheduled time, apart from the projects of course. This made it very well balanced!
 - The first project took a lot of time, otherwise it was quite balanced
 - If I spent more time then it would amount to what should be expected.
3. I took a great deal of responsibility for my own learning during the course. (Description: Here, we want to know to what extent you took responsibility for your own learning, or if you e.g. relied more on the efforts of others. Feel free to comment on your answer.) (Medel = 4,0, SD = 0,9) (1 = Disagree completely, 5 = Agree completely)



¹ Do not know/not relevant/do not wish to answer

COMMENTS:

- Låg med för lite under kursens gång, tycker det är svårt när det bara finns de obligatoriska passen och inga vanliga lektioner [2]
 - Yes, I took a great deal of responsibility for my own learning during the course. I attended all lectures except lecture 7, which I missed due to a double booking in my schedule with another course, and I tried to process the lectures closely in time to when they were given. I worked through all the computer labs and did the two projects very thoroughly. I did also spend some time on the problem sets beyond the time required in regard to attending the problem solving sessions. [5]
 - I could have spent more time on this course. [2]
 - No more than other courses [3]
 - No I fell off during this period. Barely kept my head above the water, metaphorically speaking. [2]
4. I contributed to other students' learning during the course. (Description: Here, we want to know to what extent you took responsibility for the learning of others. Have you, for example, taken an active role when studying with others, doing lab work with others, etc.? Feel free to comment on your answer.) (Medel = 3,3, SD = 1,1) (1 = Disagree completely, 5 = Agree completely)



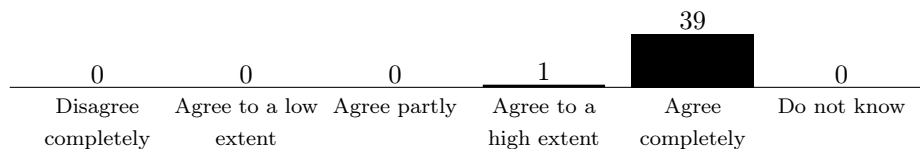
¹ Do not know/not relevant/do not wish to answer

COMMENTS:

- The projects were good for learning with someone else [4]



- I did only contribute to other students' learning in connection to the two projects of the course. I did the two projects with the same student and I would say that we helped each other a lot to understand the material of the course. [3]
 - Aside from the project, not really. [2]
 - Some of the programming parts of this course could I help peers with [2]
 - No more than other courses [3]
 - The projects were done in groups and we helped each other with difficulties (especially during the coding assignments). [3]
5. I feel that the treatment of students in the course has been good (e.g. regarding equal treatment or program affiliation) and that no one has been disadvantaged by the organization, content or execution of the teaching. (Note: If you feel that you have experienced or witnessed harassment or sexual harassment, please fill in the form at <https://doit.medfarm.uu.se/bin/kurt3/kurt/26> You can do so anonymously. For more information see https://www.it.uu.se/about_us/harassment_information (Medel = 5,0, SD = 0,2) (1 = Disagree completely, 5 = Agree completely)



COMMENTS:

- Yes! I feel that everybody was treated equally and with respect in this course. The atmosphere during all the activities of the course were very pleasant. [5]
 - Haven't witnessed anything bad. [5]
6. What do you think were the best thing(s) about this course? (Description: Here, you can highlight efforts, characteristics or parts of the course you thought were good.) (Antal obesvarade = 7)
- Good lectures and good that deadlines were not too strict and could be moved.
 - The mandatory problem sessions were great.
 - Super interesting content
 - Nope
 - The lectures were well structured!
 - Projekten var kul och givande. De lyckades motivera till kontinuerlig inläring.
 - Innehållet är spännande
 - I really liked the lectures and how the material was presented; it was presented from the beginning in a very gentle manner. The structure of the lectures (PDE theory, FDM, FEM, iterative solvers) was also very clear. I really liked the written lecture notes, they were so well written that I did not find it necessary to open up the course books even once. I must also give some praise to the course website that were very nicely designed and easy to use. Then, the lecturer of the course deserves the highest of praise - for the first time giving this course I would say that it could not have gone much better.
 - The lectures were really good! Also the problem solving sets and projects were really useful.
 - Really good projects, with a good amount of instructions. They made sure you understood the material completely.



- I really enjoyed the lectures and the projects. The lectures were quite fast and sometimes a little hard to follow. Quite often there were some question marks in my notes I had to go home and figure out afterwards. But they provided a lot of information in a way that I think gave me a great understanding of the course. The projects were fun and a bit challenging, but they really showed in practice how the different methods work.

I was sick for about two weeks around the middle of the course and had to rely on the lecture notes to keep up. This worked surprisingly well, the lecture notes were a great resource and I don't think I missed out on any information. (All lectures for sbp and fem)

- Very quick and good answers from the teacher via mail. The course was structured in a good way, with the four sections being well balanced. Despite the different subjects, the course felt like a "unit".
- It's obvious that Martin is very knowledgeable and skilled in the subject. He manages to deliver the material clearly and in a fun way. Furthermore, the lectures and "problem-passen" were well connected. The projects were a bit tough but manageable.
- Lectures were very good for understanding the course material.
- It is an interesting topic and when the project codes actually worked it was very satisfying.
- Martin
- The exam was very good. It was not too difficult, not too easy. The great problem solving sets and great lecture notes made it very easy to study for the exam and overall learn the material.

Overall, there was a lot of material which was very well written. It was clear the teacher did his best to make the course as good as possible.

- Duktig föreläsare och många bra exempel i föreläsningarna. Bra svårhetsgrad och arbetsbörda på andra projektet.
- Lectures, problem solving and the lecture notes.
- Very good teacher Martin. Also Tuan is very good! In my opinion the course was about a very interesting topic.
- Very good lectures. Problem sets were good and the projects as well!
- It's just a very well laid out course. Very concise, the blackboard focus really works, it's 3 different things (FEM, FD, linear systems of equations). I think the best thing was the problem solving sessions, where you basically just did the same derivations as on the blackboard in the lectures. This makes you actually understand the lectures and the methods presented. You don't really understand a derivation until you've actually done it yourself. And finally, as the math nerd that I am, the combination of linear algebra, calculus and programming is really satisfying in some strange way. And the teachers are great!
- Teachers were great!
- Interesting course! A good, friendly professor who took his time to explain when something in the theory hadn't clicked yet. A good "guest-lecture" with Tuan!
The LaTeX-written lecture notes were very good (and I missed them toward the end of the course), as they were easy to read and brought up everything from the lecture. It made it easy to catch up if one missed a lecture, and easy to cross-check notes. A lot nicer to read than hand-written notes!
- Best thing was the teacher, he was very good and it really felt like he wanted to us to learn the course.
- Project 2 was fun and clear.



- Projects and Problem solving gave great understanding of the course
 - The projects were educational. Martin is a very good lecturer. Tuan was also very helpful!
 - The good and illustrative way of introducing finite differences and finite elements + a lot of possibilities to ask questions (in lectures, labs and problem sessions)
 - Bra mängd och tydligt material utlagt för egna studier.
 - projects and problem solving sessions were good to fortify our understanding of the course
 - Very good teacher, everything that was taught in the course seems to be well understood by the students and it was all well connected.
 - Quite segmented and easy to grasp what components make up this course.
7. Please provide constructive suggestions for course development. (Description: With your help, the course can be made better, and something that is already good can be made even more prominent/effective.) (*Antal obesvarade = 13*)
- I would prefer regular lessons over the problem solving lessons and more of them. We didn't have too many problems to think of and solve on our own.
 - While project 1 were both fun and a good learning experience, I think we were a bit underprepared for it. Everyone I know struggled a lot with it. I think that it was especially unclear how we were supposed to construct the rhs matrices and it would have been good if that was covered a bit more beforehand. It also felt almost impossible to find any information about this online or in course literature.
 - Nope
 - The first problem session was way too much content. From the previous exams, it seems like the content of the lectures is not as advanced as the exams, but it might be from previous years.
 - Främst så var det svårt att hitta information om hur man skulle göra när det var något som var svårt. Man kunde ju utgå från exempel och anteckningar på studium, men det var inte alltid man fick svar på sin fråga där. Skulle gärna vilja att materialet på studium vore mer generellt, alltså att det förklarar hur man gör i olika situationer. På vissa ämnen upplevde jag att det fanns ett exempel i materialet, men om man själv hade ett problem som inte riktigt var samma sak som i exemplet på studium, då blev det väldigt svårt att veta.
Detta gjorde att problemlösningsspassen inte var så givande, eftersom vi mest satt och inte visste hur man skulle göra. Läraren på problemlösningsspassen fick mycket frågor så det var inte alltid möjligt att få hjälp. Detta gjorde att vi valde att hoppa över problemlösningsspassen och istället plugga med facit i efterhand.
 - Tycker att det hoppades in i sjukt svåra saker direkt. Det var liksom: ” nu ska vi gå igenom SAT” och sen var det bara ekvationer. Jag saknar en introduktion till ämnet väldigt mycket, varför det är bra mm. Kollar man på gamla föreläsningssanteckningar verkar det ha gått igenom mycket mer. Nu var det 95% ekvationer och nästan ingen förståelse till varför och vad det är bra till!
 - The only thing I would like to comment on here is the programming for the two projects of the course. It caught me a little of guard that the official programming language of the course was Python and not Matlab. When I took Scientific Computing I and II, Matlab were the only programming language used. I have indeed taken a course in Python, but that was a strict programming course; Computer Programming I, 1TD433. So, I could do basic programming in Python, but I did not really know how to do Scientific Computing in Python. Therefore, I struggled a lot with the programming



for the two projects, especially when it came to things as dealing with matrices and similar. Motivated by this, I would suggest that some more help would be given for the programming required for the projects to get started or get through the most challenging parts.

- I think the course could be improved by adding more opportunity to practice solving exercises. The exercise sessions were good, but it felt like there was a very limited amount of exercises to practice on during the course. Especially in preparation for the exam, there were pretty much nothing else to do than studying lecture notes and the theory. (Which isn't bad in itself but a lack of exercises is a bit annoying). The few old exams we had access to didn't really feel relevant towards our upcoming exam. It's of course possible to come up with exercises yourself, but I found it hard to be creative and come up with different kinds of exercises.

One very specific thing: When I was sick and studied the lecture notes at home, I found the first lecture of fem to be very confusing. It was really hard to understand a sort of overlaying concept of the method. And then there were some specifics that weren't really explained in detail (hat functions for example). So yeah I was very confused after I read the first lecture on fem until I read the introduction to the second lab. That short text answered all my questions and it gave me a so much better introduction to fem than the first lecture. In case someone else has to do this part of the course from home, maybe you could add the intro text from the lab before the lecture notes. It would have saved me a lot of time and effort trying to understand the notes.

- The exam 2023-03-15 should be used as a template for the following periods. It was much better compared to other previous exams since there was an increased number of questions, increasing the possibility to pass.
- I feel there were too few problems to solve. The amount of unique problems I've solved are probably less than ten. I don't think there is a need for scheduled lessons but instead just have a resource of problems for those that want to see more examples or test themselves. Especially for SBP-SAT since there is very little/no information online. The iteration part of the course felt a bit rushed, covering lots of methods but didn't feel like we really spent much time on them. This was however also reflected in the exam so we learned what was needed to pass.
- The course was during lectures quite abstract. The purpose of some parts of the course were unclear, such as SBT-SAT and FEM. It later cleared up during the studies for the exam, but when introduced, it was a little bit confusing. The projects demanded a lot of time, but I understand that might have been intentional. Also, having a deadline for Project 2 in the middle of different exams was stressful.
- Maybe provide more exercises.
- Betydligt fler övningsuppgifter Hjälp med programmeringen Bara att implementera i python hade kunnat vara en egen kurs
- The project was too difficult. If I had taken the course without knowing anyone I would have spent several days full time trying to solve project 1. It was the coding assignments that were the difficult ones. I think the solution would be to make more example code available, either in the labs or maybe write some code at a lecture.
- Mer tillgängliga uppgifter. Just nu fick man ett exempel av varje slags uppgift i kursen att lösa själv, vilket märktes under tentaplugget och när man skulle göra projekten.
- Not enough material to study efficiently. 4 problem sets were not enough to learn the material.
- I think that "kontinuerlig examination" would be better for this course rather than paper exam. Because i think it is Nice to show that I can implement the methods and use then practically as well



- Perhaps adjust the course content to more relevant things. From what I have understood, SBP-SAT method is not widely commonly used, and so the content we learn in this course feels somewhat niche.
- I think the course could do with one short introductory lecture or similar about complex-valued matrices, vectors, inner products, where things like hermitian operators, kroecker product etc is briefly discussed. We already know inner products, vector spaces etc from the linear algebra II course, but complex valued things, hermitian operators, etc aren't really mentioned in that course iirc. This would be especially helpful when dealing with schrödinger-type equations.

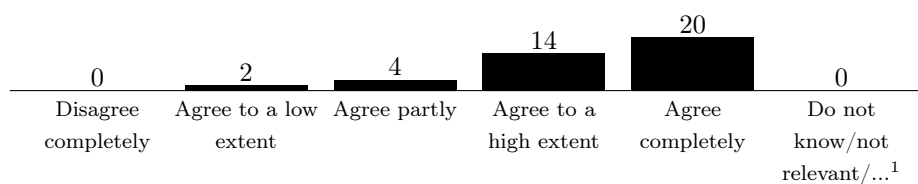
Just, it would be useful to see these properties at least once before they're used in for example solving systems of ODE:s.

- The deadlines of project 2 were too close to the exam and it was in the middle of the other exams I had this period. It would be better if the projects were scheduled so that it felt as we had time to do them.
- The computer labs should maybe have been mandatory, or their format changed. It would have been nice to see some more code examples before doing the projects - as many were confused with the code and how to transfer theory to code. Maybe in a teacher-led workshop or code snippets shown during the lectures. Or maybe a mandatory preparatory lab before the projects!

Sometimes it could be clearer what we were expected to know for the exam and what was only tested in the projects. I would also have appreciated more example problems to train on before the exam.

- More focus on the programming so a good understanding on what to do is acquired.
- The lectures often flew over my head and I think the hardest part of the course (SBP-SAT) was rushed. There were a bunch of matrices being multiplied here and there with no pause, so it was hard to follow along. I would recommend to do it more step by step, but it was good with a lot of examples! But I can't really say it was easy to understand what we were doing, even though you could figure out how to do it.
- The second project felt lack lustering and the problem solving was sometimes too hard to solve. For the first problem pass consisting of 2 questions considering of a,b, c... we could only solve 1a and 1b
- De sista avsnitten kunde skrivits på dator istället för handskrivna anteckningar.
- There are some questions as to the relevance of the SBP-SAT method and whether or not it is actually used in practice outside of Uppsala. But I don't know anything about this so I can't comment further on it.
- Maybe more smaller exercise lessons. Where each part of the current 4 problem solving questions would be thoroughly explained. However we got access to good solutions to all problem solvings regardless.

8. Overall, I am satisfied with this course. (Description: Here you are asked how well you think the course worked in relation to everything from teacher, content, forms of instruction, and examination to scheduling. Feel free to comment on your answer.) (*Medel = 4,3, SD = 0,8*) (*1 = Disagree completely, 5 = Agree completely*)



¹ Do not know/not relevant/do not wish to answer



COMMENTS:

- Tyvärr inte så rolig. Har hört många som tyckte BV3 var bra innan men i år gick det för fort och för lite förklaringar. Innehållet är greppbart men under föreläsningar var det nästan ingen av de jag pratade med som verkligen förstod, det fick man lösa själv i efterhand tyvärr! Dock intressant och givande innehåll i grunden [2]
- Yes, overall, I am satisfied with the course. As a F-student that, at this point, decided long ago that I will follow the Applied Physics branch from the 4th year of the programme, I knew that this would be my last Scientific Computing course. I am interested in more theoretical fields of physics with clear connections to applications such as electrodynamics, quantum mechanics and plasma physics. However, it is not uncommon that theoretical analysis in these fields at some point ends up at a point where it is much more convenient to, if not even impossible otherwise, to proceed through the methods of Scientific Computing treated in this course; mainly FDM and FEM but also general PDE theory and iterative methods. So, even though I will not be following the Scientific Computing branch of the F-programme, I am of the view that somebody that are interested in theoretical fields of physics with applications is greatly benefited by the knowledge of the Scientific Computing methods of this course. I find that I have been properly introduced to these methods and have the knowledge I need to potentially use them in any of the above mentioned fields, or related fields, in the future. [5]
- Great material that's covered, projects were fun and learned a lot. [5]
- It was hard to study for the exam. The only questions to use were the Problem Sets and that was not necessarily enough. However, this will get better in a couple of years when the course has more old exams that actually represent the course material. [3]
- Advanced, but overall great course! [5]
- This course was so good that I decided to do my bachelor's thesis in this subject :) [5]
- Fun course [4]
- If I would've participated more I could have a more informed opinion on this. But generally I thought everything worked pretty good and the main teacher did a good job during the lectures. [4]