FDD3023 Interactive Theorem Proving and Program Verification

Course Evaluation
LP3-4 2020

August 27, 2020

Contents

1 Summary

The evaluation form (blank sample attached) was filled in by 7 people out of 11, for a turnout of 63.64%.

Results were generally favourable (see attached results). Most questions that rate the different parts of the course received high marks on average (around 4 in a scale of 1 to 5). The lectures and course homepage were especially well-received, with ratings of 4.28 and 4.71 respectively. In contrast, the homeworks had the lowest rating, an average of 3.28. Judging by the other answers, this lower rating could be attributed to the amount of work involved and the fact that some students felt there was insufficient guidance for the required tasks.

Concerning workload, most people thought that the amount of work involved in the course was too high, with an average of 4.14 in a scale in which 1 means "too low" and 5 means "too high". In particular, 42.9% considered the workload "too high" (5) and 28.6% considered it "high" (4). When asked whether the teachers provided enough upfront advice and support to

manage time investment, 71.4% answered that they agreed (4) or completely agreed (5) with this statement.

In terms of spread of student workload, most students spent a significant amount of time learning and understanding how to structure proofs, while not so much time learning functional programming and the tooling around HOL4. There are outliers, however, as there is one person who spent a long time learning FP and one person who spent a long time learning Emacs/hol-mode.

Regarding background knowledge, most people seem to think they had enough background to follow the course. This is an interesting result since the teachers had a different opinion based on their interactions with the attendees, so perhaps there is a mismatch between the actual requirements and the perceived requirements.

The results are also consistent with the question concerning the "overall impression" of the course, which got an average of 3.8 in a scale of 1 to 5. There was only one person who ranked their overall impression as a 2, while everybody else ranked it as 3 or above, with the mode being 5.

Many students seem to have had project build automation problems, even those that were able to finish all homeworks and the final project. This is partly due to deficiencies in the SML ecosystem for build automation and the difficulty of using Holmake, but also due to students not being sufficiently familiar with the SML and HOL4 tools.

2   Action points

- Task guidance: construct "tactic cards", such that all tactics necessary/recommended for particular homeworks are on the card

- Better guidance in how to properly build/automate HOL4 projects, and combined SML/HOL4 projects.

- Provide template build files, and ideally continuous integration support. More upfront information and guidance about the Emacs hol-mode, double-checking that students can perform the basic commands.

Course Evaluation FDD3023 ITP and PV, LP3-4 2019/2020

This survey is to gather feedback from course attendees for FDD3023 Interactive Theorem Proving and Program Verification after the course offering in periods 3-4 of the 2019/2020 academic year. Answers are anonymous and will be taken into consideration to improve subsequent course offerings.

None of the fields are required. Please leave questions unanswered if they are not applicable to you - e.g. if you haven't finished the project yet, there is no need to answer questions about it.

NB. Most questions are multiple-choice questions but there are open text fields in the final section of the form where you can elaborate on your answers and/or provide any further specific comments or clarifications.

Prerequisites

1. I have previously taken a standard BSc or MSc-level course on propositional and first-order logic (or a course that included those)

    Mark only one oval.

    ◯ Yes

    ◯ No

2. I have previously taken a standard BSc or MSc-level course on functional programming using a statically-typed language such as Haskell, OCaml, Standard ML or F#

    Mark only one oval.

    ◯ Yes

    ◯ No

3. Before taking the course, I was familiar with the implementation of purely functional data structures such as functional arrays

Mark only one oval.

	1	2	3	4	5	
Completely disagree	◯	◯	◯	◯	◯	Completely agree

4. Before taking the course, I had experience writing mathematical proofs and proving theorems on pen and paper, especially using mathematical induction

Mark only one oval.

	1	2	3	4	5	
Completely disagree	◯	◯	◯	◯	◯	Completely agree

5. I feel that I had enough prior knowledge to be able to follow the course

Mark only one oval.

	1	2	3	4	5	
Completely disagree	◯	◯	◯	◯	◯	Completely agree

Learning outcomes

6.   The learning outcomes in the course syllabus clearly describe what I was expected
     to learn in the course

Mark only one oval.

	1	2	3	4	5	
Completely disagree	◯	◯	◯	◯	◯	Completely agree

Learning

> Please leave questions unanswered if they are not applicable to you.

7.   The course structure is appropriate in order to reach the intended learning outcome
     of the course

Mark only one oval.

	1	2	3	4	5	
Completely disagree	◯	◯	◯	◯	◯	Completely agree

8.   Lectures worked well

Mark only one oval.

	1	2	3	4	5	
Completely disagree	◯	◯	◯	◯	◯	Completely agree

9.   Support/office hours worked well

Mark only one oval.

	1	2	3	4	5	
Completely disagree	◯	◯	◯	◯	◯	Completely agree

10. The course literature (including other course material) supported the learning well

Mark only one oval.

	1	2	3	4	5	
Completely disagree	◯	◯	◯	◯	◯	Completely agree

Assessment

Please leave questions unanswered if they are not applicable to you - e.g. if you haven't finished the project yet, there is no need to answer questions about it.

11. The assessment (including all compulsory elements like homework and project) tested whether I had reached the intended learning outcomes of the course

Mark only one oval.

	1	2	3	4	5	
Completely disagree	◯	◯	◯	◯	◯	Completely agree

12. Homeworks (including deadlines) worked well

Mark only one oval.

	1	2	3	4	5	
Completely disagree	◯	◯	◯	◯	◯	Completely agree

13. The final project worked well

Mark only one oval.

	1	2	3	4	5	
Completely disagree	◯	◯	◯	◯	◯	Completely agree

Course administration

14.   The information emails during the course worked well

Mark only one oval.

	1	2	3	4	5	
Completely disagree	◯	◯	◯	◯	◯	Completely agree

15.   The course homepage worked well

Mark only one oval.

	1	2	3	4	5	
Completely disagree	◯	◯	◯	◯	◯	Completely agree

Workload

> Please leave questions unanswered if they are not applicable to you.

16.   The course workload as related to the number of credits was...

Mark only one oval.

	1	2	3	4	5	
Too low	◯	◯	◯	◯	◯	Too high

17. The teachers provided enough upfront advice and support to manage time investment and avoid getting stuck for too long in proof search

Mark only one oval.

	1	2	3	4	5	
Completely disagree	◯	◯	◯	◯	◯	Completely agree

18. I spent a significant amount of time learning/understanding functional programming

Mark only one oval.

	1	2	3	4	5	
Completely disagree	◯	◯	◯	◯	◯	Completely agree

19. I spent a significant amount of time learning/understanding how to structure proofs

Mark only one oval.

	1	2	3	4	5	
Completely disagree	◯	◯	◯	◯	◯	Completely agree

20. I spent a significant amount of time learning/understanding how to use Emacs and/or HOL mode

Mark only one oval.

	1	2	3	4	5	
Completely disagree	◯	◯	◯	◯	◯	Completely agree

21.   I spent a significant amount of time installing HOL4 and PolyML

Mark only one oval.

	1	2	3	4	5	
Completely disagree	◯	◯	◯	◯	◯	Completely agree

Working environment

22.   The organization, content and teaching of this course have been designed and executed so that everyone can feel included, welcome and seen

Mark only one oval.

	1	2	3	4	5	
Completely disagree	◯	◯	◯	◯	◯	Completely agree

23.   How has the interaction between students and teachers worked in this course?

_____

_____

_____

_____

_____

Overall impression

24. What is your overall impression of the course?

Mark only one oval.

	1	2	3	4	5	
Very poor	◯	◯	◯	◯	◯	Excellent

Suggestions

> This section can be used to elaborate on any of the previous multiple-choice questions if needed. Feel free to comment or discuss on any of the preceding topics.

25. What should be kept for the next round of this course?

_____

_____

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_____

26. Is there anything that should be changed for the next round of this course, and if so: how?

_____

_____

_____

_____

_____

27. Any other comments or thoughts?

_____

_____

_____

_____

_____

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Course Evaluation FDD3023 ITP and PV, LP3-4 2019/2020

7 responses

Publish analytics

Prerequisites

I have previously taken a standard BSc or MSc-level course on propositional and first-order logic (or a course that included those)

7 responses
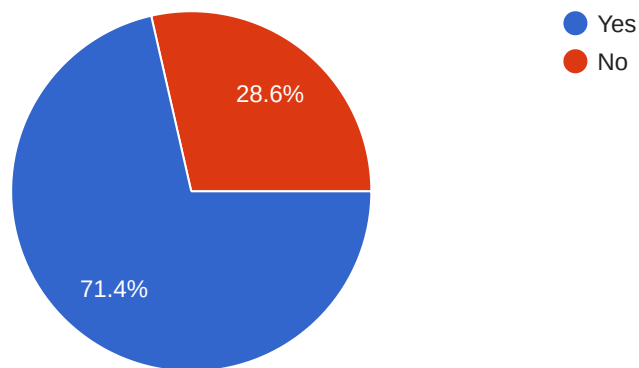
I have previously taken a standard BSc or MSc-level course on functional programming using a statically-typed language such as Haskell, OCaml, Standard ML or F#

7 responses
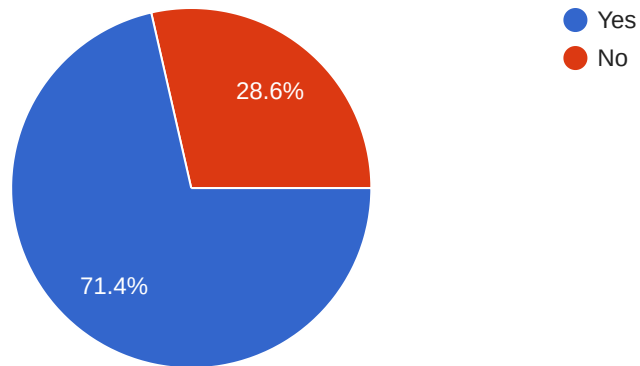
Before taking the course, I was familiar with the implementation of purely functional data structures such as functional arrays

7 responses
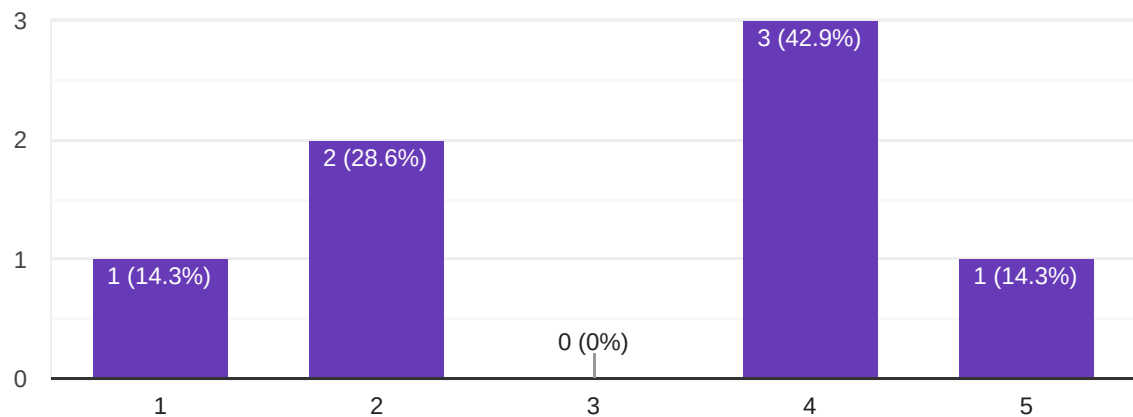
Before taking the course, I had experience writing mathematical proofs
and proving theorems on pen and paper, especially using mathematical
induction

7 responses
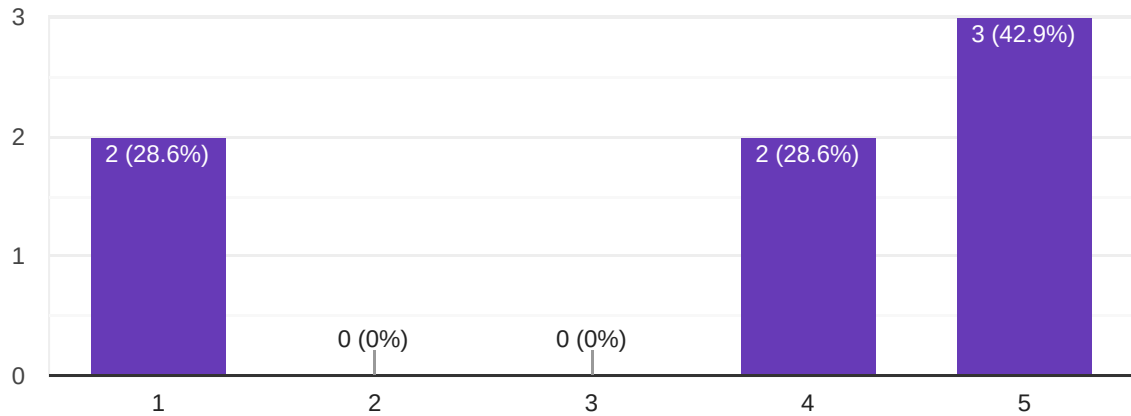
I feel that I had enough prior knowledge to be able to follow the course

7 responses
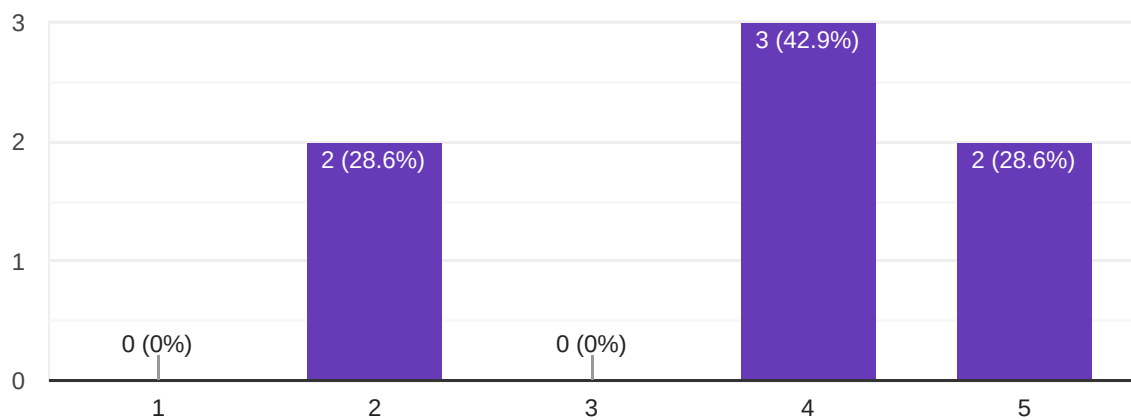
Learning outcomes

The learning outcomes in the course syllabus clearly describe what I was expected to learn in the course

7 responses
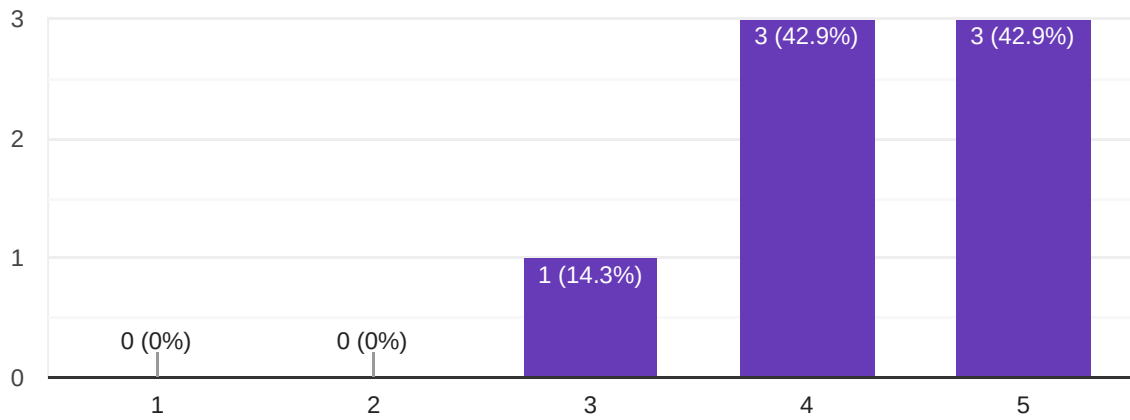
Learning

The course structure is appropriate in order to reach the intended learning outcome of the course

7 responses
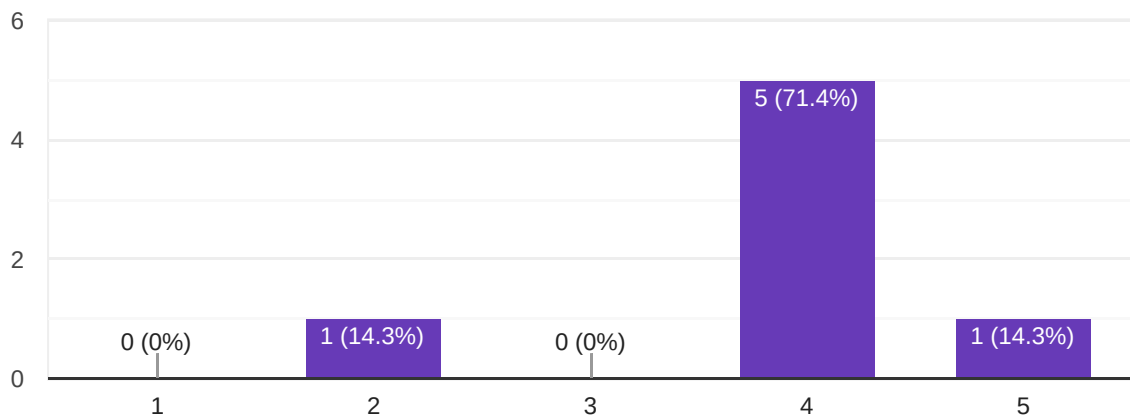
Lectures worked well

7 responses
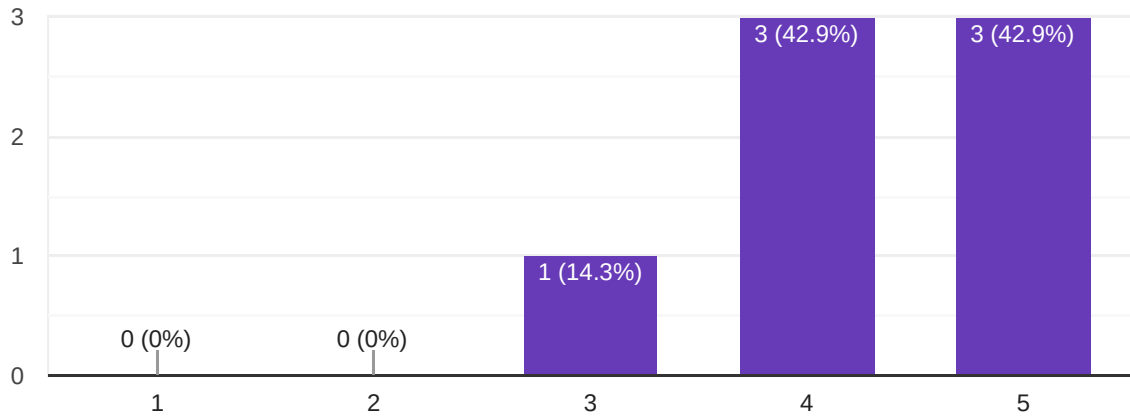
Support/office hours worked well

7 responses
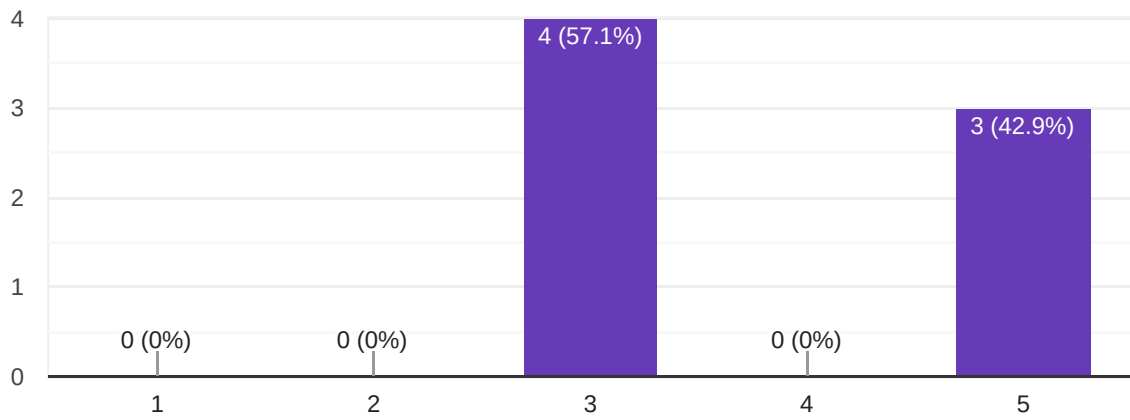
The course literature (including other course material) supported the learning well

7 responses
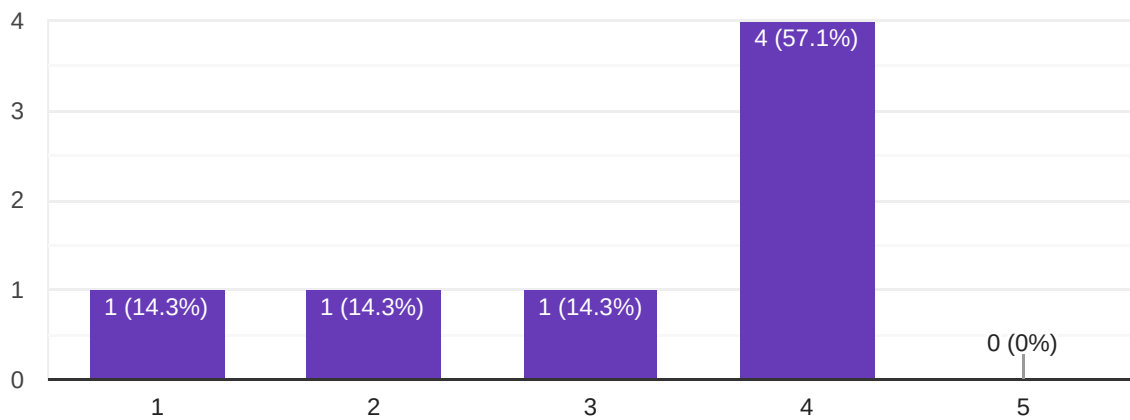
Assessment

The assessment (including all compulsory elements like homework and project) tested whether I had reached the intended learning outcomes of the course

7 responses
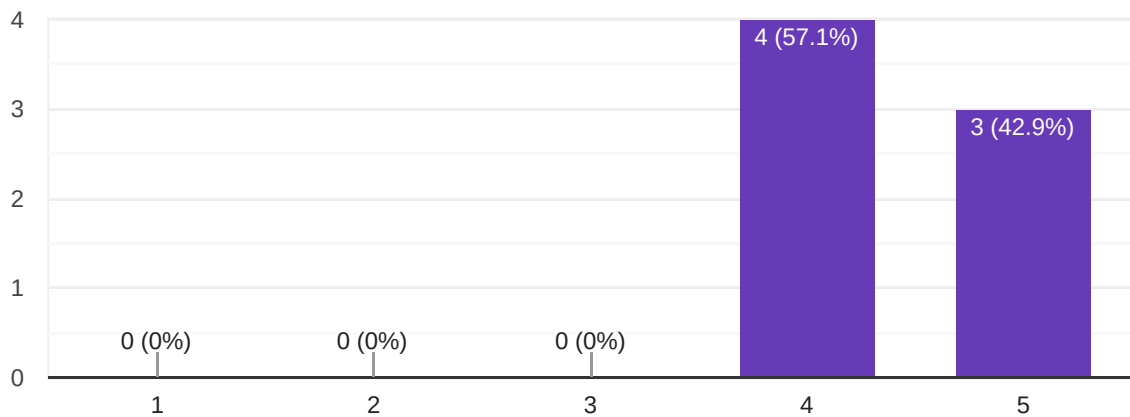
Homeworks (including deadlines) worked well
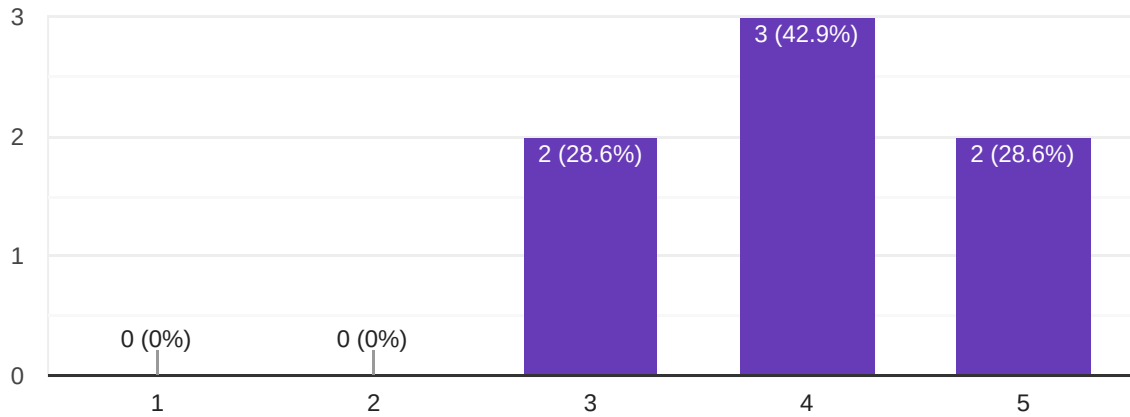
7 responses
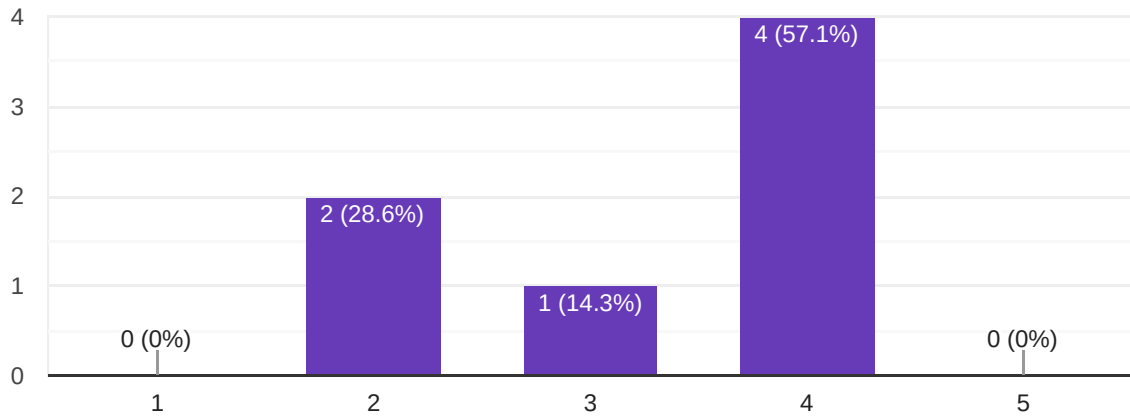
The final project worked well
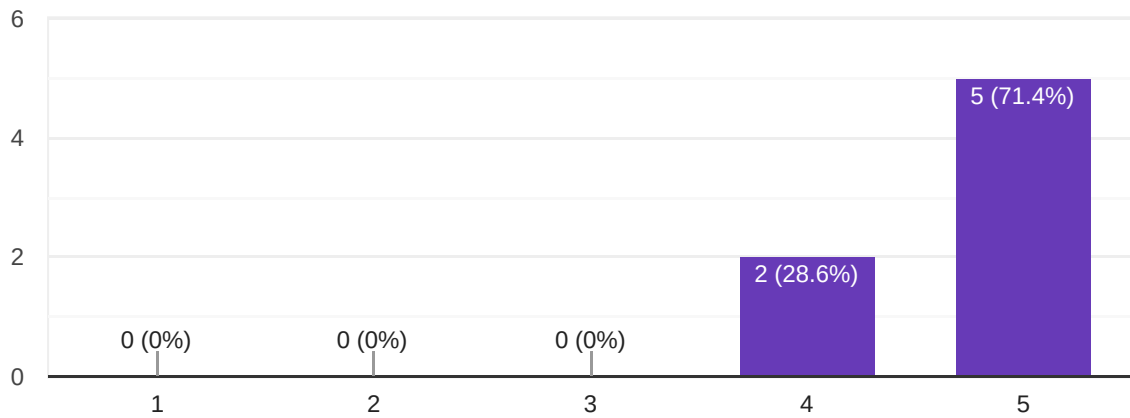
7 responses
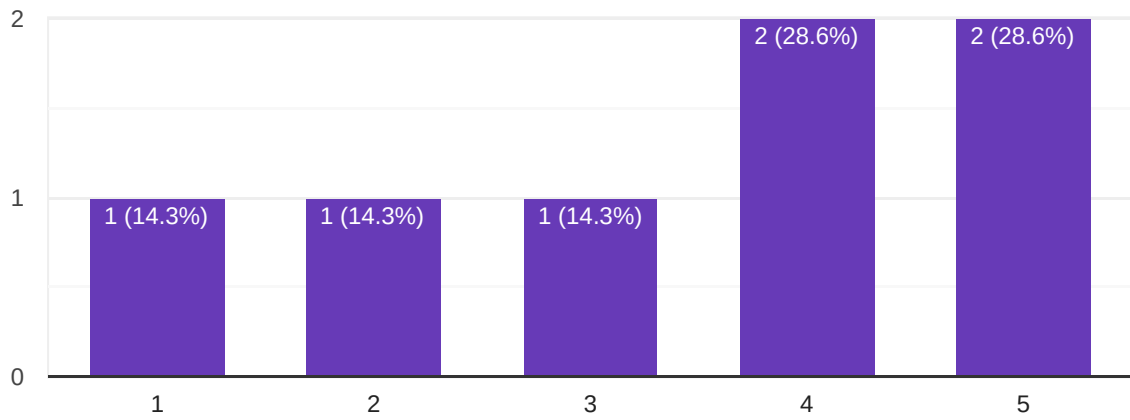
Course administration

The information emails during the course worked well

7 responses

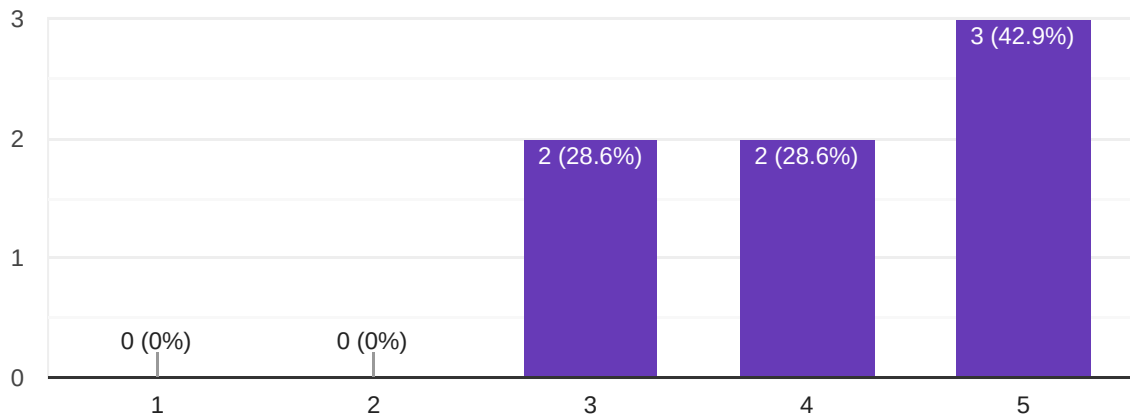## The course homepage worked well
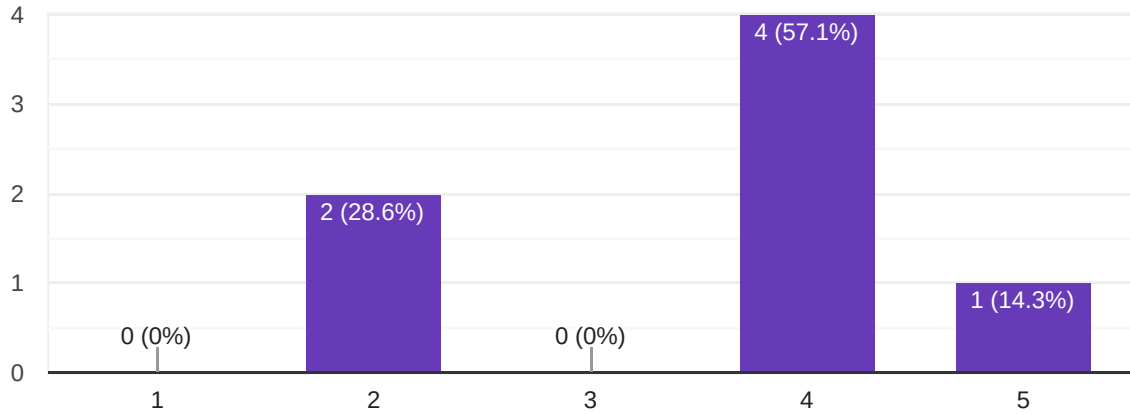
7 responses

Workload

The course workload as related to the number of credits was...
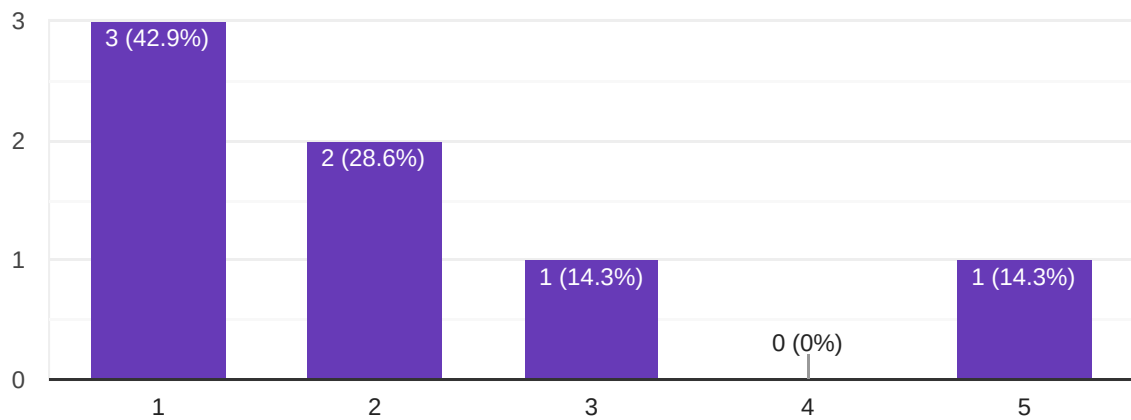
7 responses

The teachers provided enough upfront advice and support to manage time investment and avoid getting stuck for too long in proof search

7 responses

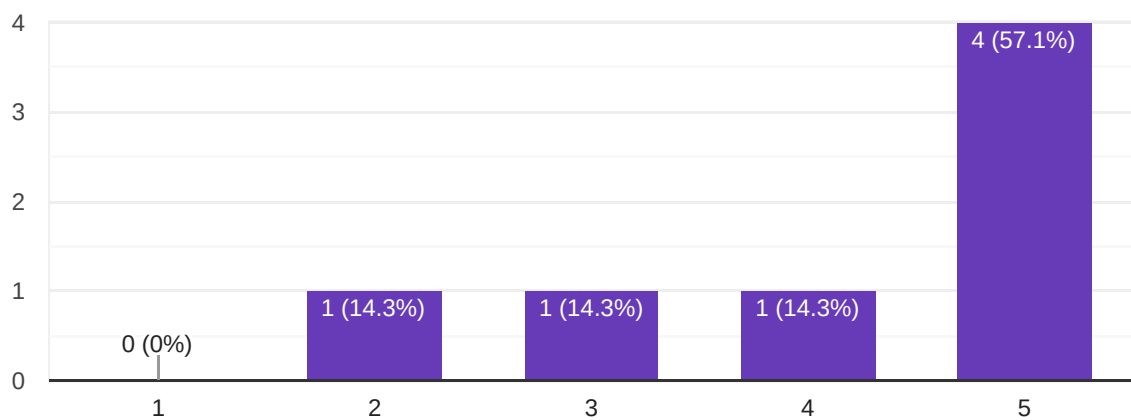## I spent a significant amount of time learning/understanding functional programming
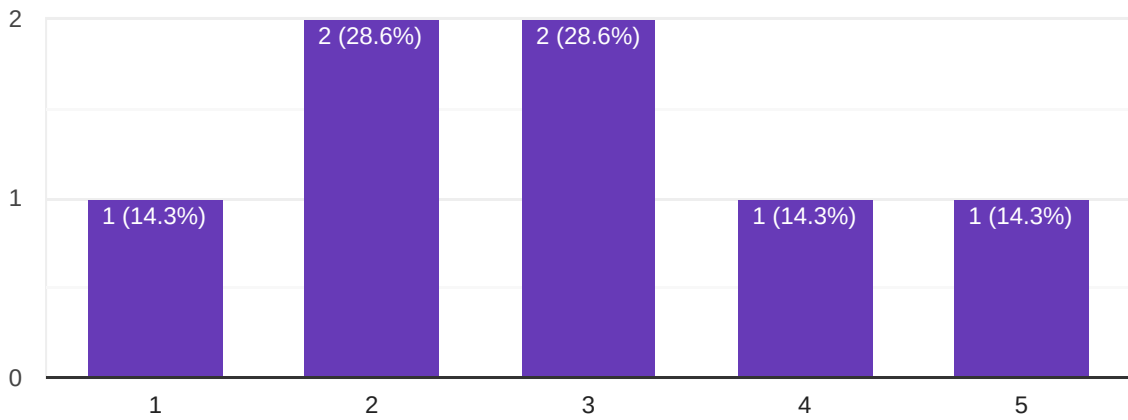
7 responses

I spent a significant amount of time learning/understanding how to structure proofs
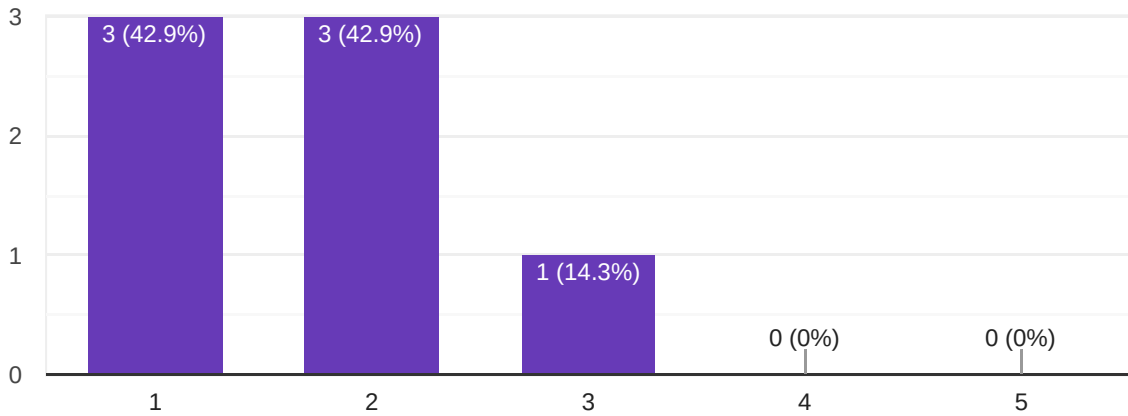
7 responses

I spent a significant amount of time learning/understanding how to use Emacs and/or HOL mode

7 responses

I spent a significant amount of time installing HOL4 and PolyML
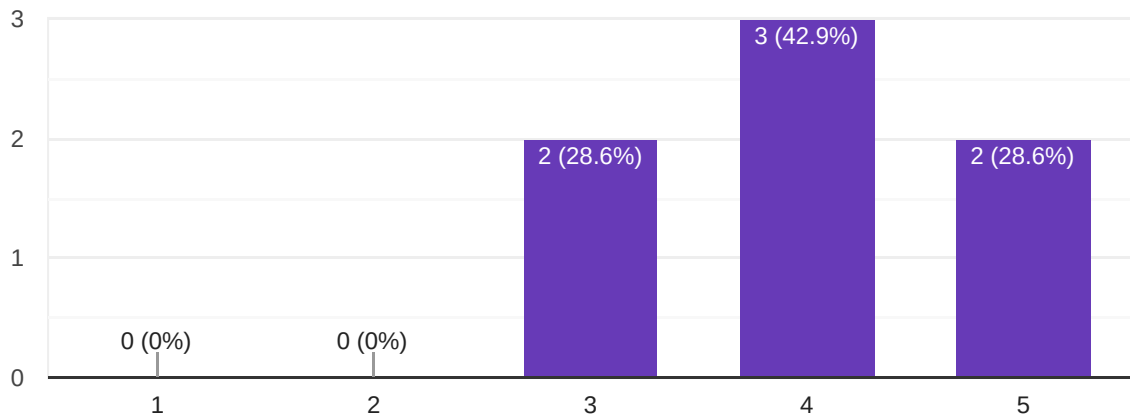
7 responses

Working environment

The organization, content and teaching of this course have been designed
and executed so that everyone can feel included, welcome and seen

7 responses

How has the interaction between students and teachers worked in this course?

4 responses

Decently. Good in lectures. Over e-mail, teachers have been very helpful, but it sometimes
takes several weeks to get an answer.

I think the help section on Monday afternoon is good.
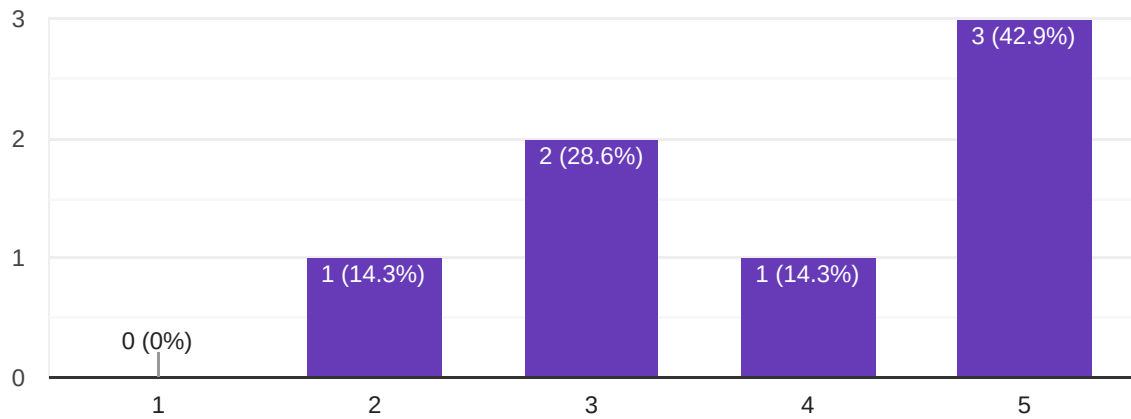
Good but better before the lessons were online

The teachers were very positive and supportive.

Overall impression

What is your overall impression of the course?

7 responses

Value	Count
1	0 (0%)
2	1 (14.3%)
3	2 (28.6%)
4	1 (14.3%)
5	3 (42.9%)

Suggestions

What should be kept for the next round of this course?

3 responses

Most homeworks and and the project are interesting and work well for teaching the content (except for how time-consuming they are).

Examples of proofs

Lectures and project

Is there anything that should be changed for the next round of this course, and if so: how?

4 responses

The amount of work per credit needs to be drastically recalibrated (lowered).

While the material contained in the lectures are generally good, they don't seem that well structured, and often feel a bit all over the place, making it hard to follow.

The lectures needs to be synced better with the homeworks. A few times we were supposed to apply knowledge in a homework that isn't taught until 1 or 2 weeks after the homework.

The lectures need to teach (and emphasize) things that are needed for certain tasks but not included in any documentation (or in a few cases included but erroneous).

Yes, maybe less homework.

The homeworks could be changed to be more equal in workload

In my opinion, this course was too ambitious in the amount of content the students were expected to learn for 7.5 credits. This was by far the most time consuming course I've taken in my life, and much of that time was spent searching for examples

Any other comments or thoughts?

3 responses

Since this is a PhD level course I expected it to include more theory of ITP, but it was more of a practical course on how to use one specific tool (HOL4).

None

The teachers were friendly and helpful; my comments only refer to the course structure and HOL4's inadequate documentation.

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