# Course Analysis for NUMN32 Numerical Methods for Differential Equations, Autumn 2024

## Course Information

**Lecturer: Tony Stillfjord**
**Teaching assistants: Marvin Jans, Niklas Kotarsky, Jaime Manriquez, Måns Williamson**
**Number of students:**
30 registered students.
16 students answered the course evaluation survey, 7 of them from a Bachelor programmes, 6 from a Master's programme, and 3 from an "Other" programme, i.e. likely exchange students. Note that the number of survey respondents is listed as 178 because it was sent out also to the LTH students by mistake.

## Examination

**Computer projects:** 29 students passed.
**Written examination:** 16 students passed.

- Ordinary examination 2024-01-05: 24 students participated and 16 of them passed.
- First re-exam 2024-04-01: not yet held at the time of writing.

**Final grades**
In all, 16 students, have got their final grade.
6 passed with distinction.
10 passed.

## Course Evaluation

**Summary of student's answers:**
The course is a shared course between NF and LTH where the majority of students come from LTH. Separate course evaluations are done for the LTH and NF students. The NF version was sent out on Jan. 19 and was open until Feb. 09. Overall, the students seem happy with the course, though they wish the course literature was better.

**Changes from the previous course realization:**

- The course book was changed from Iserles to Salgado & Wise.
- Further, complete solutions to all the study questions were provided from day one rather than with a slight delay.

**Teachers' comments:** The course contains three lectures a week plus an extra lecture in the first week where the course content and some organizational aspects are explained. All teaching took place on campus. After three years

with two lecturers, there was only one this year. This will likely continue to be the case for a few years.

A major change from last year is the change of course book, from Iserles to Salgado & Wise. This was prompted by the fact that while Iserles's book covers much of the course contents, his setup is not fully aligned with mine. There have also been continued complaints that it is hard to read. The new course book is better aligned with the course and easier to read. In addition, it also covers many other numerical analysis topics in depth which are very important but which the engineering students in particular have not properly encountered. With Salgado & Wise it was possible to decrease the time spent during lectures on teaching these topics and instead allocate this time to further discuss how to use them for what we really want to do.

There is still no one-to-one mapping between the course book and the course contents, and the lecture notes are still the main course literature. Judging from the survey responses, this could be communicated even more clearly next year.

In contrast to previous years, there were no negative comments regarding the study questions, and in fact no comments about them at all in the survey free text answers. While this is good, I still argue that the very "streamlined" setup with complete solutions is detrimental to the students' learning processes even if they don't recognize this. Various ways to increase active engagement with the material should be investigated.

The course contains three mandatory computer projects. In the projects, the students have to implement the introduced methods, apply them to simple problems and interpret the results. We provide a Matlab repetition in the first week and one to two exercise sessions every week where the students can ask the teaching assistants for help with their code. These projects are then presented to a teaching assistant who provides some feedback and a pass/fail grade. In the case of a fail, they get the opportunity to update their project and hand in a revised version. This year, like most years, many students passed every project at the first opportunity and almost everyone had passed all the projects at the end of the course.

67% of the NF students who took the exam passed, which is consistent with last year. Judging from previous years, this will certainly increase after the first re-exam in April and is therefore no cause for concern. However, it is interesting that the first-time success rate among the NF students is lower than for the LTH students, which was about 90% both this and last year. It is unclear why this discrepancy exists, but the fact that the NF students have a much more varied background than the LTH students likely plays a role.

Overall, the course seems to work quite well at the moment.

**Suggestions for the next course realisation:**

- Work on better integrating the new course literature into the course will continue.
- The computer project instructions will be revised such that Python is

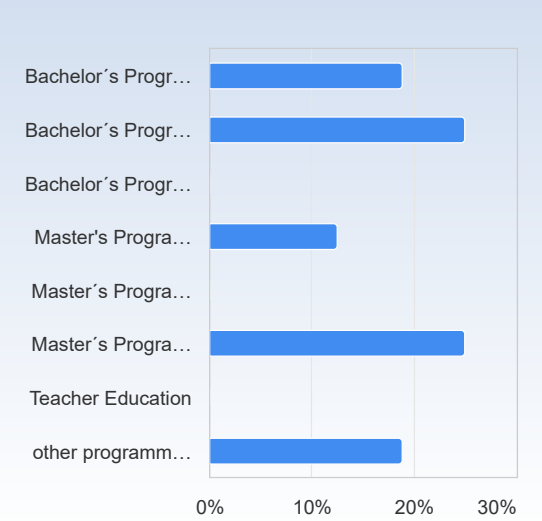
the “first” programming language, with Matlab being the second option, rather than the current opposite approach. This is due to a change in the basic programming course for the Pi and F programmes at LTH.

# NUMN32HT24 Numerical Methods for Differential Equations

Respondents: 178
Answer Count: 16
Answer Frequency: 8.99%

## I have studied this course as part of

| I have studied this course as part of | Number of responses |
|---|---|
| Bachelor´s Programme in Mathematics | 3 (18.8%) |
| Bachelor´s Programme in Physics, Theoretical Physics, Astronomy | 4 (25.0%) |
| Bachelor´s Programme, other specialization | 0 (0.0%) |
| Master's Programme in Mathematics | 2 (12.5%) |
| Master´s Programme in Mathematical Statistics | 0 (0.0%) |
| Master´s Programme, other specialization | 4 (25.0%) |
| Teacher Education | 0 (0.0%) |
| other programme or as stand alone course | 3 (18.8%) |
| Total | 16 (100.0%) |

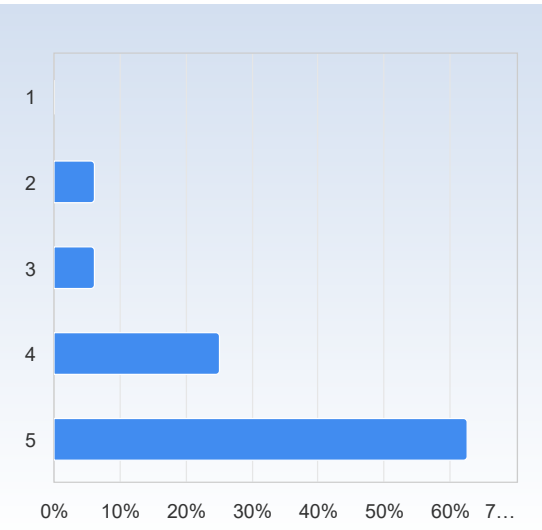



| | Mean | Standard Deviation |
|---|---|---|
| I have studied this course as part of | 4.2 | 2.7 |

## On the scale 1-5 select the option that best matches your opinion: 1= disagree completely → 3= partly agree → 5= agree completely

### 2. My prior knowledge has been sufficient to assimilate the contents of this course.

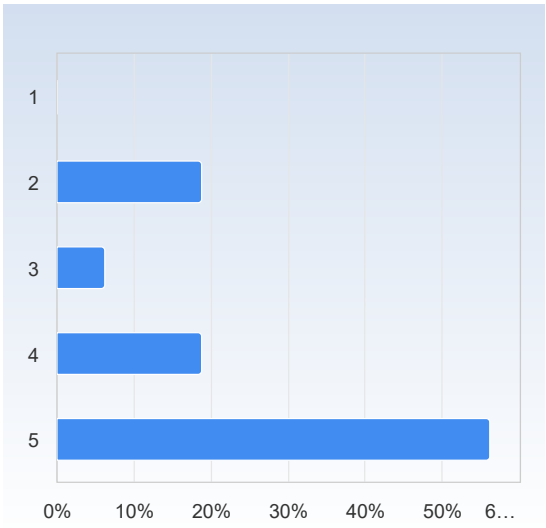
| 2. My prior knowledge has been sufficient to assimilate the contents of this course. | Number of responses |
|---|---|
| 1 | 0 (0.0%) |
| 2 | 1 (6.2%) |
| 3 | 1 (6.2%) |
| 4 | 4 (25.0%) |
| 5 | 10 (62.5%) |
| Total | 16 (100.0%) |



| | Mean | Standard Deviation |
|---|---|---|
| 2.My prior knowledge has been sufficient to assimilate the contents of this course. | 4.4 | 0.9 |

### 3.I have participated actively in the course.

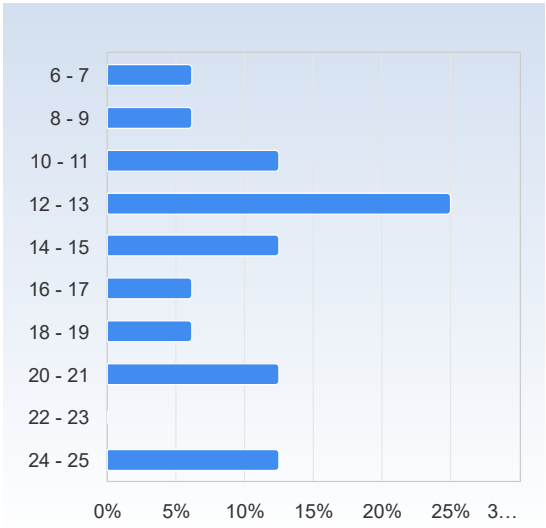
| 3.I have participated actively in the course. | Number of responses |
|---|---|
| 1 | 0 (0.0%) |
| 2 | 3 (18.8%) |
| 3 | 1 (6.2%) |
| 4 | 3 (18.8%) |
| 5 | 9 (56.2%) |
| Total | 16 (100.0%) |




| | Mean | Standard Deviation |
|---|---|---|
| 3.I have participated actively in the course. | 4.1 | 1.2 |

### Average number of hours spent in total on the course per week (including scheduled activities):

| Average number of hours spent in total on the course per week (including scheduled activities): | Number of responses |
|---|---|
| 6 - 7 | 1 (6.2%) |
| 8 - 9 | 1 (6.2%) |
| 10 - 11 | 2 (12.5%) |
| 12 - 13 | 4 (25.0%) |
| 14 - 15 | 2 (12.5%) |
| 16 - 17 | 1 (6.2%) |
| 18 - 19 | 1 (6.2%) |
| 20 - 21 | 2 (12.5%) |
| 22 - 23 | 0 (0.0%) |
| 24 - 25 | 2 (12.5%) |
| Total | 16 (100.0%) |



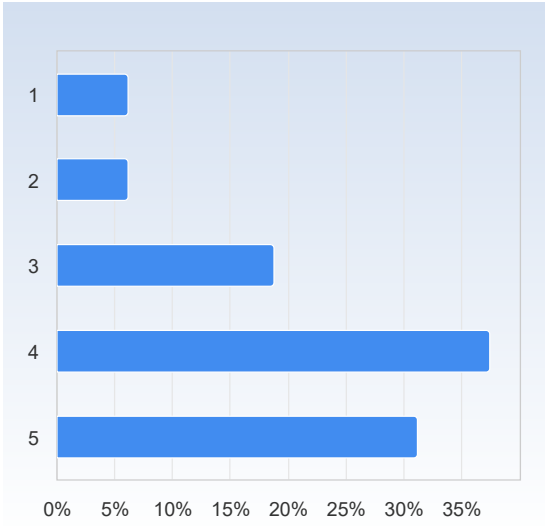

| | Mean | Standard Deviation |
|---|---|---|
| Average number of hours spent in total on the course per week (including scheduled activities): | 14.9 | 5.5 |

## The course in general

### On the scale 1-5 select the option that best matches your opinion: 1= disagree completely → 3= partly agree → 5= agree completely

#### The way the course was taught and organised suited me.

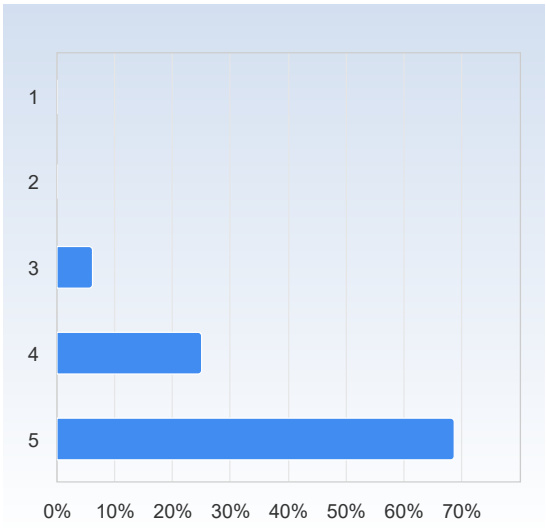
| The way the course was taught and organised suited me. | Number of responses |
|---|---|
| 1 | 1 (6.2%) |
| 2 | 1 (6.2%) |
| 3 | 3 (18.8%) |
| 4 | 6 (37.5%) |
| 5 | 5 (31.2%) |
| Total | 16 (100.0%) |




| | Mean | Standard Deviation |
|---|---|---|
| The way the course was taught and organised suited me. | 3.8 | 1.2 |

#### The number of teacher lead activities (lectures, seminars etc.) has been satisfactory.

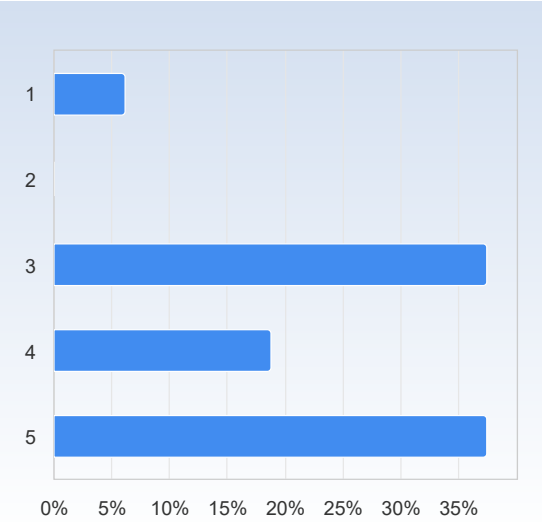
| The number of teacher lead activities (lectures, seminars etc.) has been satisfactory. | Number of responses |
|---|---|
| 1 | 0 (0.0%) |
| 2 | 0 (0.0%) |
| 3 | 1 (6.2%) |
| 4 | 4 (25.0%) |
| 5 | 11 (68.8%) |
| Total | 16 (100.0%) |




| | Mean | Standard Deviation |
|---|---|---|
| The number of teacher lead activities (lectures, seminars etc.) has been satisfactory. | 4.6 | 0.6 |

## The lectures were valuable for my learning.

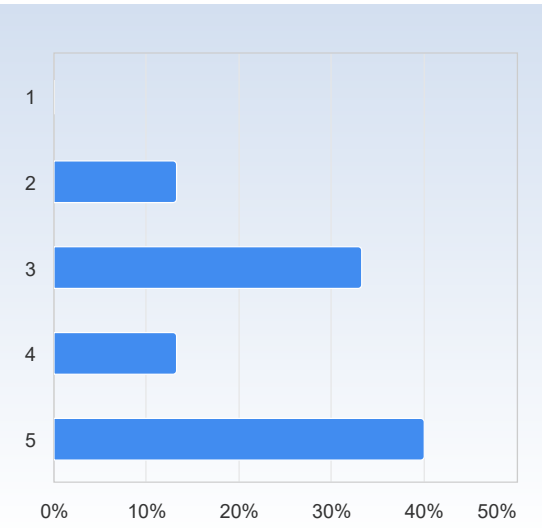
| The lectures were valuable for my learning. | Number of responses |
|---|---|
| 1 | 1 (6.2%) |
| 2 | 0 (0.0%) |
| 3 | 6 (37.5%) |
| 4 | 3 (18.8%) |
| 5 | 6 (37.5%) |
| Total | 16 (100.0%) |




| | Mean | Standard Deviation |
|---|---|---|
| The lectures were valuable for my learning. | 3.8 | 1.2 |

## The seminars were valuable for my learning.

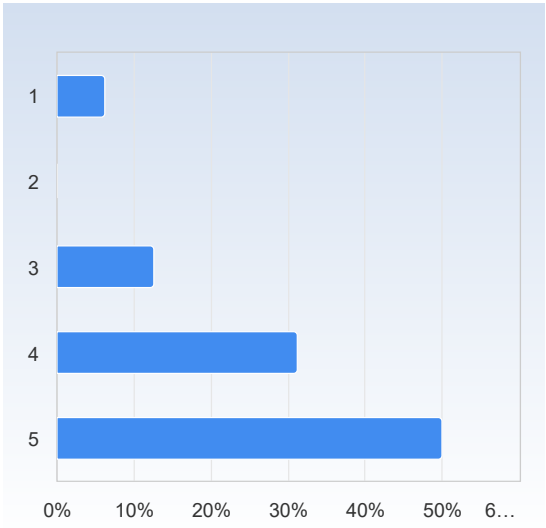
| The seminars were valuable for my learning. | Number of responses |
|---|---|
| 1 | 0 (0.0%) |
| 2 | 2 (13.3%) |
| 3 | 5 (33.3%) |
| 4 | 2 (13.3%) |
| 5 | 6 (40.0%) |
| Total | 15 (100.0%) |




| | Mean | Standard Deviation |
|---|---|---|
| The seminars were valuable for my learning. | 3.8 | 1.1 |

### Studying on my own was valuable for my learning.

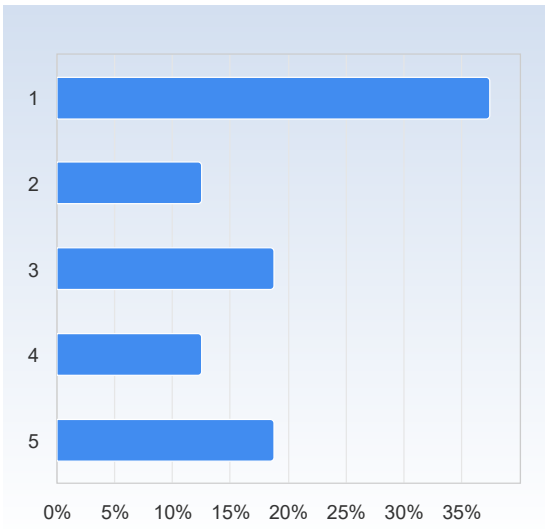
| Studying on my own was valuable for my learning. | Number of responses |
|---|---|
| 1 | 1 (6.2%) |
| 2 | 0 (0.0%) |
| 3 | 2 (12.5%) |
| 4 | 5 (31.2%) |
| 5 | 8 (50.0%) |
| Total | 16 (100.0%) |




| | Mean | Standard Deviation |
|---|---|---|
| Studying on my own was valuable for my learning. | 4.2 | 1.1 |

### The course literature/material was a valuable learning resource.

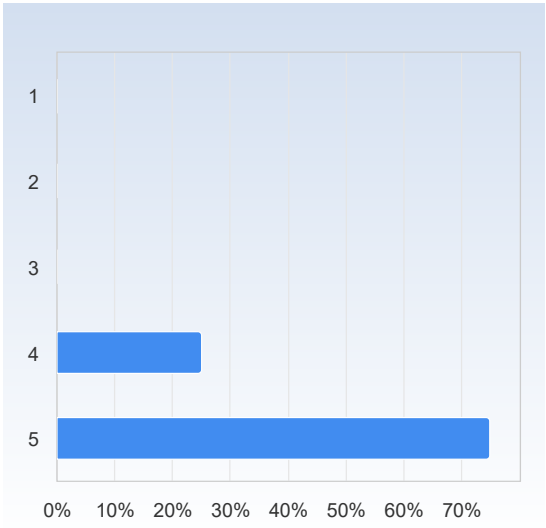
| The course literature/material was a valuable learning resource. | Number of responses |
|---|---|
| 1 | 6 (37.5%) |
| 2 | 2 (12.5%) |
| 3 | 3 (18.8%) |
| 4 | 2 (12.5%) |
| 5 | 3 (18.8%) |
| Total | 16 (100.0%) |




| | Mean | Standard Deviation |
|---|---|---|
| The course literature/material was a valuable learning resource. | 2.6 | 1.6 |

### The information I received before the course start was satisfactory.

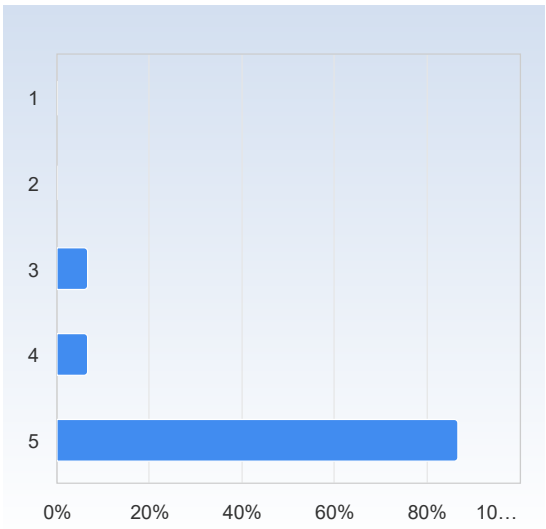
| The information I received before the course start was satisfactory. | Number of responses |
|---|---|
| 1 | 0 (0.0%) |
| 2 | 0 (0.0%) |
| 3 | 0 (0.0%) |
| 4 | 4 (25.0%) |
| 5 | 12 (75.0%) |
| Total | 16 (100.0%) |




| | Mean | Standard Deviation |
|---|---|---|
| The information I received before the course start was satisfactory. | 4.8 | 0.4 |

### The communication with the teaching staff during the course was good.

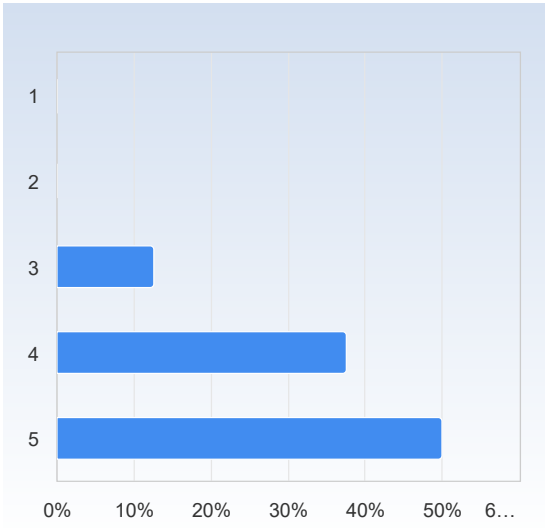
| The communication with the teaching staff during the course was good. | Number of responses |
|---|---|
| 1 | 0 (0.0%) |
| 2 | 0 (0.0%) |
| 3 | 1 (6.7%) |
| 4 | 1 (6.7%) |
| 5 | 13 (86.7%) |
| Total | 15 (100.0%) |




| | Mean | Standard Deviation |
|---|---|---|
| The communication with the teaching staff during the course was good. | 4.8 | 0.6 |

### It was clear throughout the course what was expected of me.

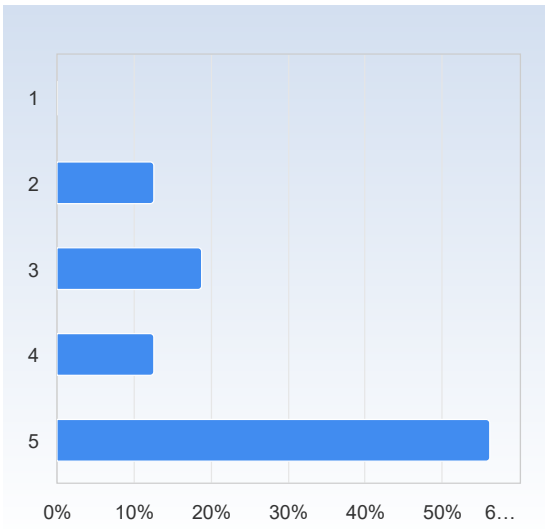
| It was clear throughout the course what was expected of me. | Number of responses |
|---|---|
| 1 | 0 (0.0%) |
| 2 | 0 (0.0%) |
| 3 | 2 (12.5%) |
| 4 | 6 (37.5%) |
| 5 | 8 (50.0%) |
| Total | 16 (100.0%) |




| | Mean | Standard Deviation |
|---|---|---|
| It was clear throughout the course what was expected of me. | 4.4 | 0.7 |

### I have received valuable feedback from my teacher/teachers during the course.

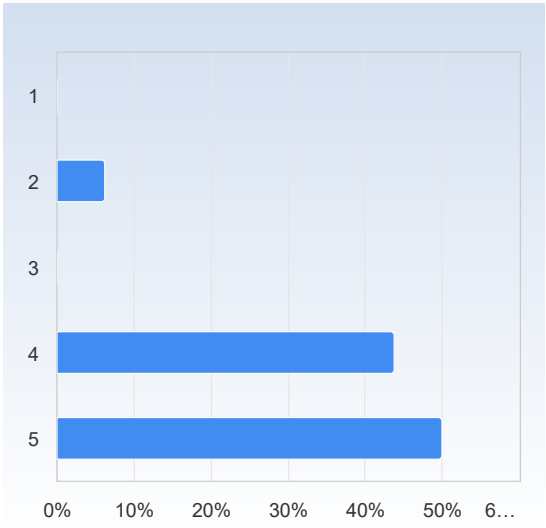
| I have received valuable feedback from my teacher /teachers during the course. | Number of responses |
|---|---|
| 1 | 0 (0.0%) |
| 2 | 2 (12.5%) |
| 3 | 3 (18.8%) |
| 4 | 2 (12.5%) |
| 5 | 9 (56.2%) |
| Total | 16 (100.0%) |




| | Mean | Standard Deviation |
|---|---|---|
| I have received valuable feedback from my teacher/teachers during the course. | 4.1 | 1.1 |

### The course had a reasonable workload.

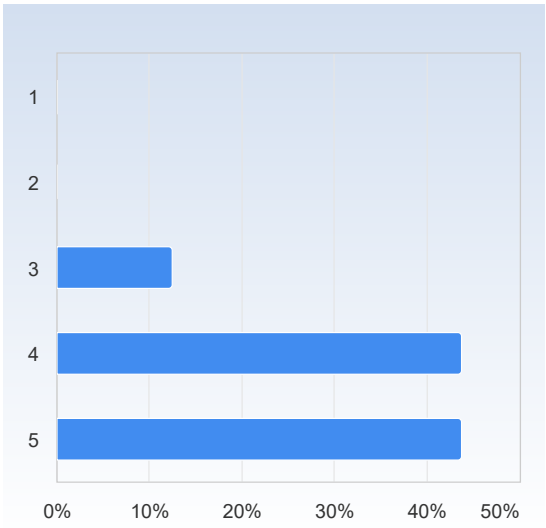
| The course had a reasonable workload. | Number of responses |
|---|---|
| 1 | 0 (0.0%) |
| 2 | 1 (6.2%) |
| 3 | 0 (0.0%) |
| 4 | 7 (43.8%) |
| 5 | 8 (50.0%) |
| Total | 16 (100.0%) |




| | Mean | Standard Deviation |
|---|---|---|
| The course had a reasonable workload. | 4.4 | 0.8 |

### The workload was evenly distributed throughout the course.

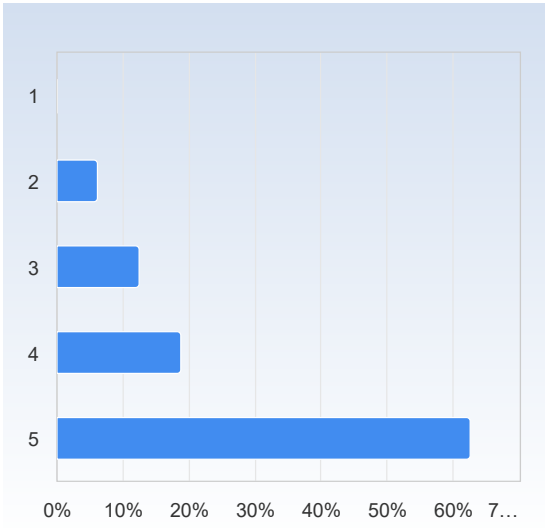
| The workload was evenly distributed throughout the course. | Number of responses |
|---|---|
| 1 | 0 (0.0%) |
| 2 | 0 (0.0%) |
| 3 | 2 (12.5%) |
| 4 | 7 (43.8%) |
| 5 | 7 (43.8%) |
| Total | 16 (100.0%) |




| | Mean | Standard Deviation |
|---|---|---|
| The workload was evenly distributed throughout the course. | 4.3 | 0.7 |

### The examination matched the contents and level of the course.

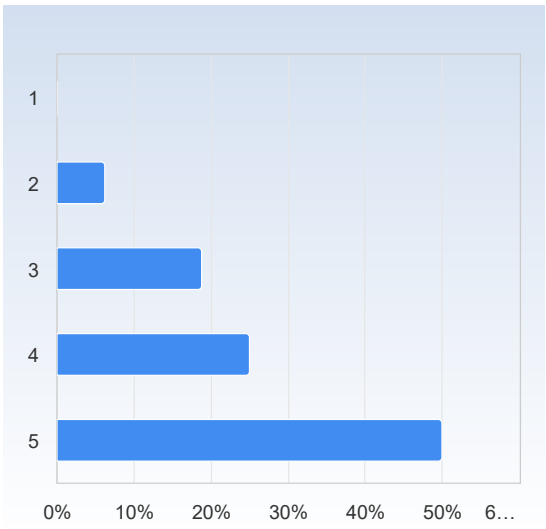
| The examination matched the contents and level of the course. | Number of responses |
|---|---|
| 1 | 0 (0.0%) |
| 2 | 1 (6.2%) |
| 3 | 2 (12.5%) |
| 4 | 3 (18.8%) |
| 5 | 10 (62.5%) |
| Total | 16 (100.0%) |




| | Mean | Standard Deviation |
|---|---|---|
| The examination matched the contents and level of the course. | 4.4 | 1.0 |

### Overall, I am satisfied with the course.

| Overall, I am satisfied with the course. | Number of responses |
|---|---|
| 1 | 0 (0.0%) |
| 2 | 1 (6.2%) |
| 3 | 3 (18.8%) |
| 4 | 4 (25.0%) |
| 5 | 8 (50.0%) |
| Total | 16 (100.0%) |



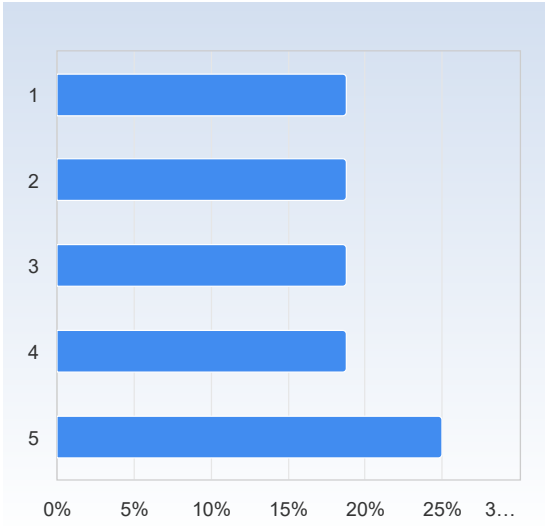

| | Mean | Standard Deviation |
|---|---|---|
| Overall, I am satisfied with the course. | 4.2 | 1.0 |

## On the development of generic skills

## On a scale 1-5 select the option that best matches your opinion: 1= disagree completely → 3= partly agree → 5= agree completely

### The course has increased my ability to read a mathematical text.

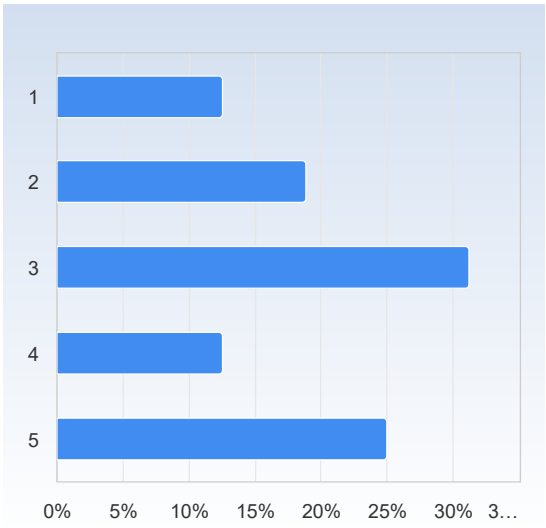
| The course has increased my ability to read a mathematical text. | Number of responses |
|---|---|
| 1 | 3 (18.8%) |
| 2 | 3 (18.8%) |
| 3 | 3 (18.8%) |
| 4 | 3 (18.8%) |
| 5 | 4 (25.0%) |
| Total | 16 (100.0%) |




| | Mean | Standard Deviation |
|---|---|---|
| The course has increased my ability to read a mathematical text. | 3.1 | 1.5 |

### The course has increased my ability to communicate the subject in writing.

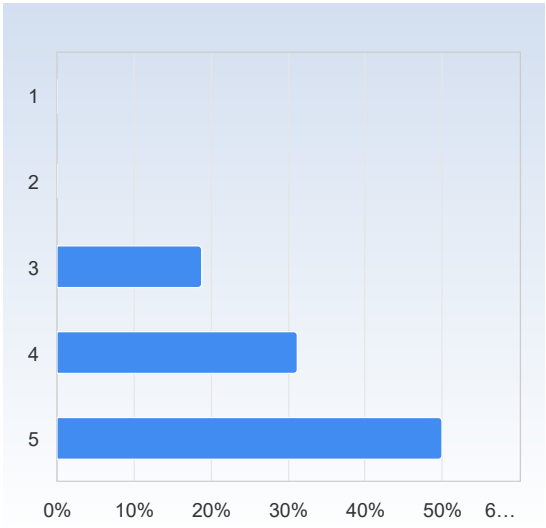
| The course has increased my ability to communicate the subject in writing. | Number of responses |
|---|---|
| 1 | 2 (12.5%) |
| 2 | 3 (18.8%) |
| 3 | 5 (31.2%) |
| 4 | 2 (12.5%) |
| 5 | 4 (25.0%) |
| Total | 16 (100.0%) |




| | Mean | Standard Deviation |
|---|---|---|
| The course has increased my ability to communicate the subject in writing. | 3.2 | 1.4 |

### The course has increased my ability to communicate the subject orally.

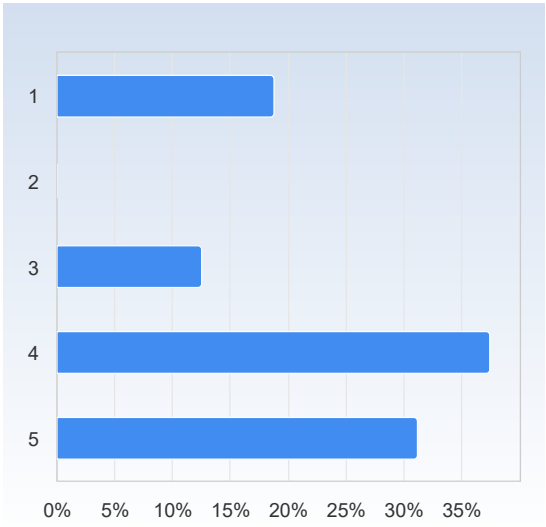
| The course has increased my ability to communicate the subject orally. | Number of responses |
|---|---|
| 1 | 0 (0.0%) |
| 2 | 0 (0.0%) |
| 3 | 3 (18.8%) |
| 4 | 5 (31.2%) |
| 5 | 8 (50.0%) |
| Total | 16 (100.0%) |




| | Mean | Standard Deviation |
|---|---|---|
| The course has increased my ability to communicate the subject orally. | 4.3 | 0.8 |

### The course has increased my ability to cooperate.

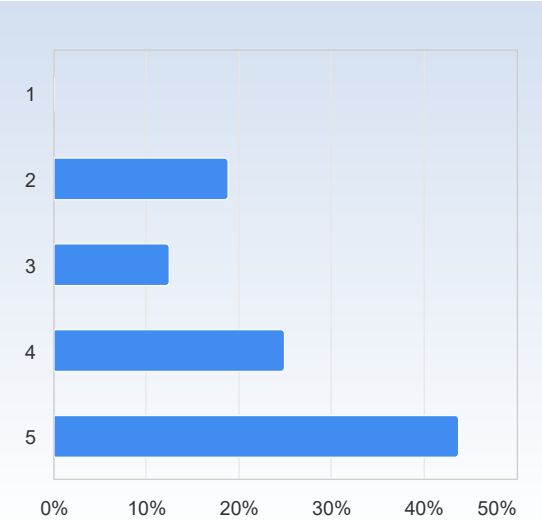
| The course has increased my ability to cooperate. | Number of responses |
|---|---|
| 1 | 3 (18.8%) |
| 2 | 0 (0.0%) |
| 3 | 2 (12.5%) |
| 4 | 6 (37.5%) |
| 5 | 5 (31.2%) |
| Total | 16 (100.0%) |




| | Mean | Standard Deviation |
|---|---|---|
| The course has increased my ability to cooperate. | 3.6 | 1.5 |

### The course has increased my ability to search and process information.

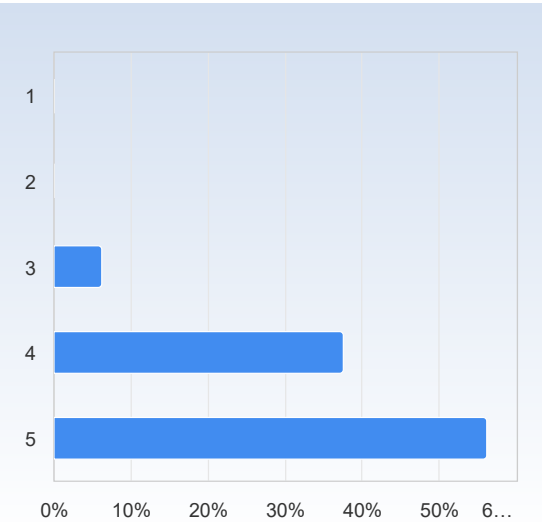
| The course has increased my ability to search and process information. | Number of responses |
|---|---|
| 1 | 0 (0.0%) |
| 2 | 3 (18.8%) |
| 3 | 2 (12.5%) |
| 4 | 4 (25.0%) |
| 5 | 7 (43.8%) |
| Total | 16 (100.0%) |




| | Mean | Standard Deviation |
|---|---|---|
| The course has increased my ability to search and process information. | 3.9 | 1.2 |

### The course has increased my ability to analyze and solve problems.

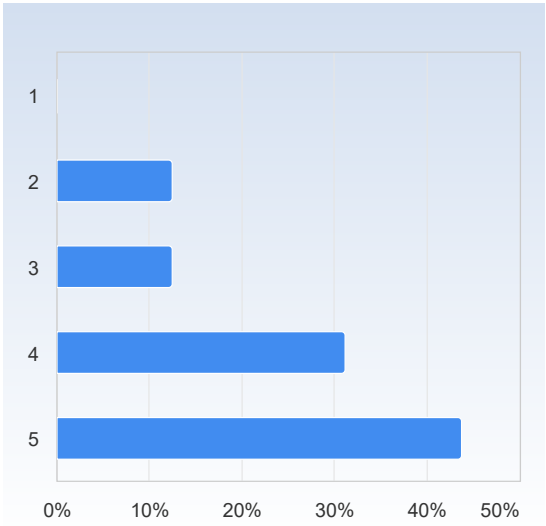
| The course has increased my ability to analyze and solve problems. | Number of responses |
|---|---|
| 1 | 0 (0.0%) |
| 2 | 0 (0.0%) |
| 3 | 1 (6.2%) |
| 4 | 6 (37.5%) |
| 5 | 9 (56.2%) |
| Total | 16 (100.0%) |




| | Mean | Standard Deviation |
|---|---|---|
| The course has increased my ability to analyze and solve problems. | 4.5 | 0.6 |

**As a result of this course, I feel confident about tackling unfamiliar problems.**

| As a result of this course, I feel confident about tackling unfamiliar problems. | Number of responses |
|---|---|
| 1 | 0 (0.0%) |
| 2 | 2 (12.5%) |
| 3 | 2 (12.5%) |
| 4 | 5 (31.2%) |
| 5 | 7 (43.8%) |
| Total | 16 (100.0%) |




| | Mean | Standard Deviation |
|---|---|---|
| As a result of this course, I feel confident about tackling unfamiliar problems. | 4.1 | 1.1 |