

Course analysis MATM38 Spring 2021

Lecturer: Jan-Fredrik Olsen

Teaching assistants: None

Number of registered students: 20

Course results (results from previous edition of course in parenthesis):

- Examination (May and August): Out of **14** students, there were **3 U, 3 G, 8 VG**
- For comparison, the total number from VT20 were: 1 U, 4 G, 5 VG.

Explanation of grading scheme: Students could obtain points during the course as follows:

- Attendance in problem seminars (non-compulsory): up to 1 point/seminar (5 in total)
- Written homework assignments (non-compulsory): up to 2.5 points/homework (2 in total)
- Written exam (compulsory): up to 30 points.
- Oral exam (compulsory): Up to 15 points.

For the grade G, the students needed to obtain at least 15 points on the written exam, 7.5 points on the oral exam, and a total score of at least 25 points.

For the grade G, the students needed to obtain at least 15 points on the written exam, 7.5 points on the oral exam, and a total score of at least 40 points.

Summary of students answers to the course evaluation: 9 students answered the course survey. Here is a breakdown of the scores for the individual questions:

1. My prior knowledge has been sufficient to assimilate the contents of this course: 4.8
2. I have participated actively in the course: 3.3
3. Average number of hours spent in total on the course per week: 11.2
4. The way the course was taught and organized suited me: 4.1
5. The number of teacher led activities has been satisfactory: 5.0
6. The lectures (live) were valuable for my learning: 3.8
7. The lectures (recorded) were valuable for my learning: 4.3
8. The seminars were valuable for my learning: 3.9
9. The written assignments were valuable for my learning: 4.1
10. Studying on my own was valuable for my learning: 4.8
11. The course literature/material was a valuable learning resource: 4.4
12. The information I received before the course start was satisfactory: 4.2
13. The communication with the teaching staff during the course was good: 4.7
14. It was clear throughout the course what was expected of me: 4.6
15. I have received valuable feedback from my teacher during the course: 4.6
16. The course had a reasonable workload: 4.1
17. The workload was evenly distributed throughout the course: 4.4
18. The examination matched the contents and level of the course: 4.4
19. Overall, I am satisfied with the course: 4.6

20. The course increased my ability to read a mathematical text: 3.3
21. The course has increased my ability to communicate the subject in writing: 3.6
22. The course has increased my ability to communicate the subject orally: 3.4
23. The course has increased my ability to cooperate: 3.4
24. The course has increased my ability to search and process information: 3.1
25. The course has increased my ability to analyze and solve problems: 3.8
26. As a result of this course, I feel confident about tackling unfamiliar problems: 3.6

See the attach survey (below) for the free-text answers.

Teacher's commentary: The course was given online, with both lectures and problem seminars given via Zoom. This has the advantage that lectures can be recorded, however, it has the disadvantage that it becomes harder for students and teachers to interact. In particular, the question "I have participated actively in the course" is one of the lowest scoring ones in the course survey (however, the questions "The way the course was taught and organized suited me" and "Overall, I am satisfied with the course" gets the scores 4.1 and 4.6, respectively, which we consider satisfactory).

In the free-text answers, the students seem positive with respect to how the course was taught. In particular, the students seemed to appreciate the teaching material and the fact that the lectures were recorded. The students also seemed to appreciate the occasional "5 minutes on my research".

In terms of what should be improved, some students note that the course material needs to be streamlined, and that they found the written exam stressful.

Teacher's suggestions for changes in the next edition of this course:

- The textbook of the course (Stein and Shakarchi) assumes no previous knowledge of Fourier analysis, nor does it use Lebesgue integration. This may not be entirely appropriate as the course in Linear Analysis, which does cover significant parts of Fourier analysis, is a pre-requisite. This term, some additional material was added to take this into account. This material needs to be streamlined, and the choice of textbook should be re-considered. Also, the question of whether or not to include some aspects of the Lebesgue integral should be discussed.

Teacher's evaluation of changes since previous edition of course:

- In the previous course evaluation, a students noted that the first part of the course "felt a bit slow" (probably due to overlap with the linear analysis course. As a result of this, a small poll was conducted at the start of the course to increase the lecturers knowledge of the background of the students. This led to a the material leading up to the L2 convergence of Fourier series to be covered in less time than in previous years. In this course evaluation, the question "My prior knowledge has been sufficient to assimilate the contents of this course" got the score 4.8, which indicates that this was a reasonable adjustment of the course.

Student representative's comments: As remarked by the students in the survey, the student representative would first like to congratulate and thank the teacher for the quality of his

lectures, the structure of the course and the feedback given to the students. Notably, a lot of them agreed to the importance of the online discussion service Piazza, that helped to ask questions and suggest comments on both lectures and exercises.

The student representative received several comments about the accessibility of lecture recordings. During the first half of the course, the recordings were only made public during a few days, and were taken down once the next lecture was available. After a request from some students, the availability period increased during the second half of the course to one week, with two lectures public at the same time. All recordings have been made available during Easter weekend, and after May 15th, by popular request. The student representative acknowledges the difficulty of maintaining focus in live lectures during the pandemic, and therefore wants here to thank the teacher for his cooperation.

The student representative also wants to notice that, even though he personally did not take Linear Analysis—following the course as a stand alone course—he barely ever lacked previous knowledge from that course. This is in line with a student's comment to the student representative, and has been raised by students and the teacher during a lecture, noting that there might have been a lot of redundancies between the Linear Analysis and Fourier Analysis courses.

Several students also noted that using Riemann theory in that course added some complexity to the lectures, because of missing keys from Lebesgue theory which had to be circumvented with some extensive and technical results. While some students might not have taken Integration Theory before, introducing some Lebesgue theory to the course might be a good idea to avoid these technicalities—which become trivial with Lebesgue theory.

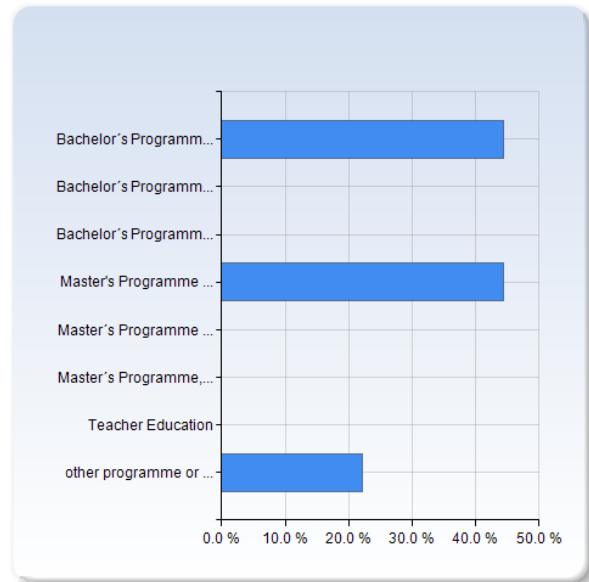
Finally, the student representative wants to address the disparition of the last chapter (about Fourier analysis on \mathbb{R}^d or Dirichlet's theorem), which has not been covered due to a lack of time. On the online forum Piazza, some students pointed out they would have wanted to see the use of Fourier analysis to prove Dirichlet's theorem—something which was reported to be seen in Analytic number theory. The student representative thinks the amount of time spent on the chapters was sufficient—even though there have been a lot of redundancies when the teacher repeated the content of the previous lecture during the first part of each lecture. While these rehearsals have been appreciated by students, the amount of time spent on these could have been used to cover the last chapter—or at least to give an overview on it.

MATM38 Fourier Analysis Spring 2021 (version 2)

Answer Count: 9

I have studied this course as part of

I have studied this course as part of	Number of Responses
Bachelor's Programme in Mathematics	4 (44.4%)
Bachelor's Programme in Physics, Theoretical Physics, Astronomy	0 (0.0%)
Bachelor's Programme, other specialization	0 (0.0%)
Master's Programme in Mathematics	4 (44.4%)
Master's Programme in Mathematical Statistics	0 (0.0%)
Master's Programme, other specialization	0 (0.0%)
Teacher Education	0 (0.0%)
other programme or as stand alone course	2 (22.2%)
Total	10 (111.1%)

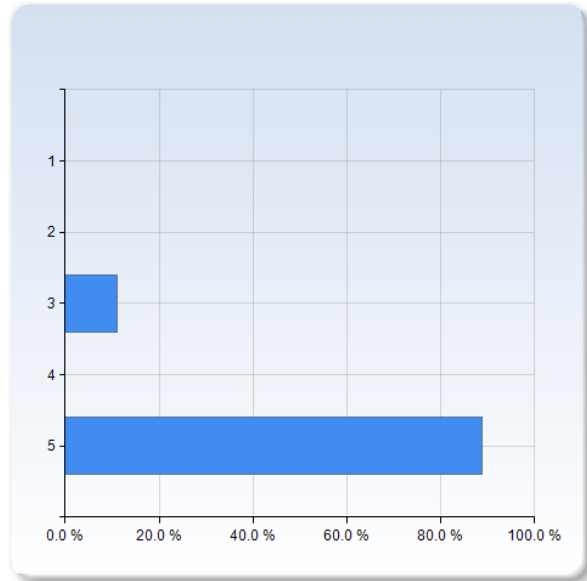


I have studied this course as part of	Mean	Standard Deviation
	3.6	2.7

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.

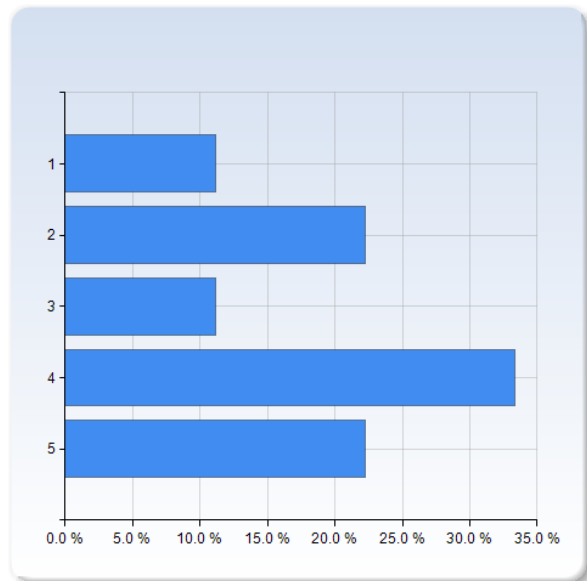
2. My prior knowledge has been sufficient to assimilate the contents of this course.	Number of Responses
1	0 (0.0%)
2	0 (0.0%)
3	1 (11.1%)
4	0 (0.0%)
5	8 (88.9%)
Total	9 (100.0%)



	Mean	Standard Deviation
2. My prior knowledge has been sufficient to assimilate the contents of this course.	4.8	0.7

3. I have participated actively in the course.

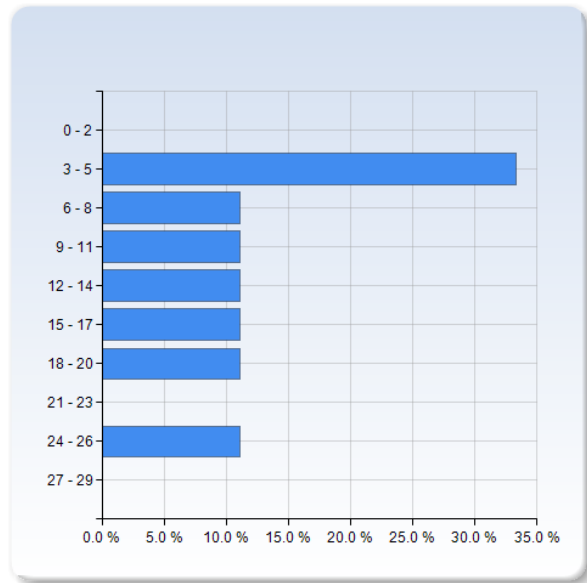
3. I have participated actively in the course.	Number of Responses
1	1 (11.1%)
2	2 (22.2%)
3	1 (11.1%)
4	3 (33.3%)
5	2 (22.2%)
Total	9 (100.0%)



	Mean	Standard Deviation
3. I have participated actively in the course.	3.3	1.4

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
0 - 2	0 (0.0%)
3 - 5	3 (33.3%)
6 - 8	1 (11.1%)
9 - 11	1 (11.1%)
12 - 14	1 (11.1%)
15 - 17	1 (11.1%)
18 - 20	1 (11.1%)
21 - 23	0 (0.0%)
24 - 26	1 (11.1%)
27 - 29	0 (0.0%)
Total	9 (100.0%)



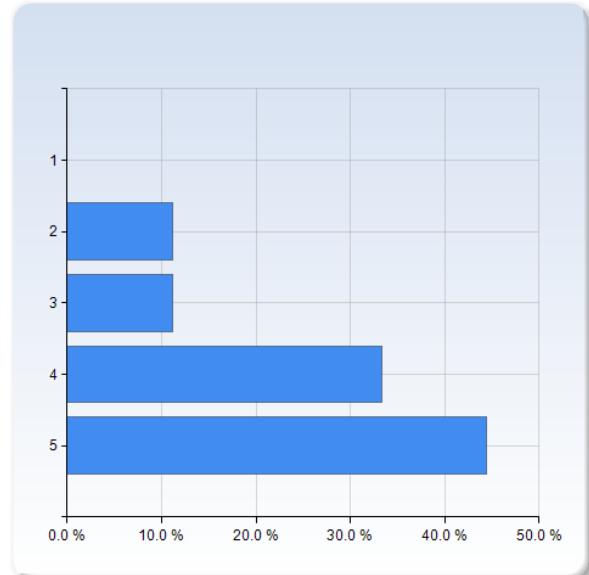
Average number of hours spent in total on the course per week (including scheduled activities):	Mean	Standard Deviation
	11.2	7.1

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.

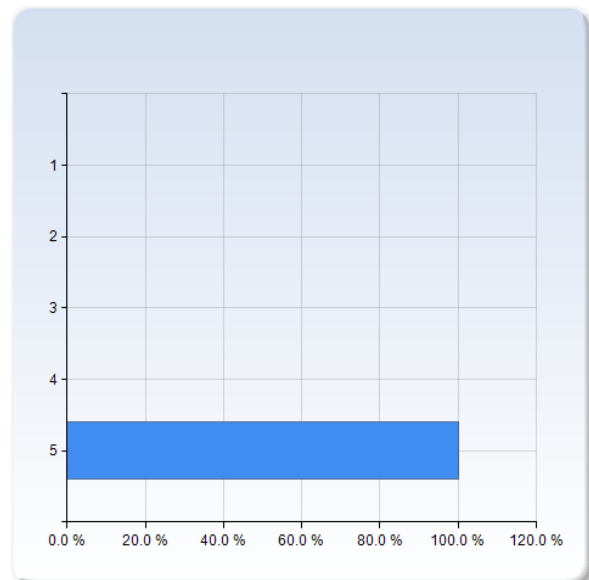
The way the course was taught and organised suited me.	Number of Responses
1	0 (0.0%)
2	1 (11.1%)
3	1 (11.1%)
4	3 (33.3%)
5	4 (44.4%)
Total	9 (100.0%)



	Mean	Standard Deviation
The way the course was taught and organised suited me.	4.1	1.1

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

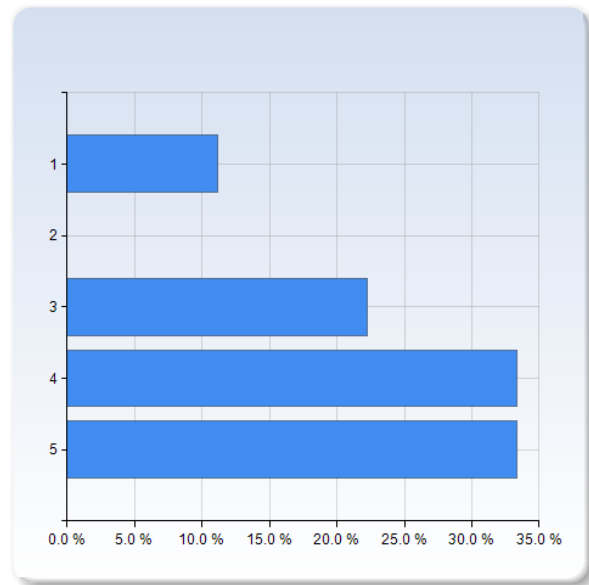
The number of teacher lead activities (lectures, seminars etc.) has been satisfactory.	Number of Responses
1	0 (0.0%)
2	0 (0.0%)
3	0 (0.0%)
4	0 (0.0%)
5	9 (100.0%)
Total	9 (100.0%)



	Mean	Standard Deviation
The number of teacher lead activities (lectures, seminars etc.) has been satisfactory.	5.0	0.0

The lectures (live) were valuable for my learning.

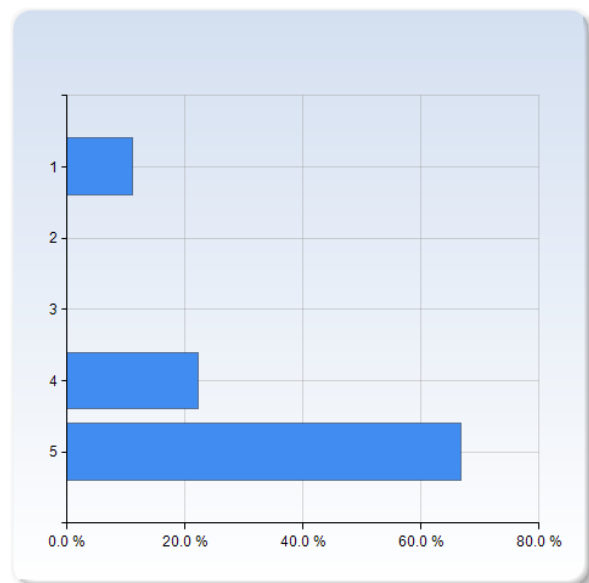
The lectures (live) were valuable for my learning.	Number of Responses
1	1 (11.1%)
2	0 (0.0%)
3	2 (22.2%)
4	3 (33.3%)
5	3 (33.3%)
Total	9 (100.0%)



The lectures (live) were valuable for my learning.	Mean	Standard Deviation
	3.8	1.3

The lectures (recorded) were valuable for my learning.

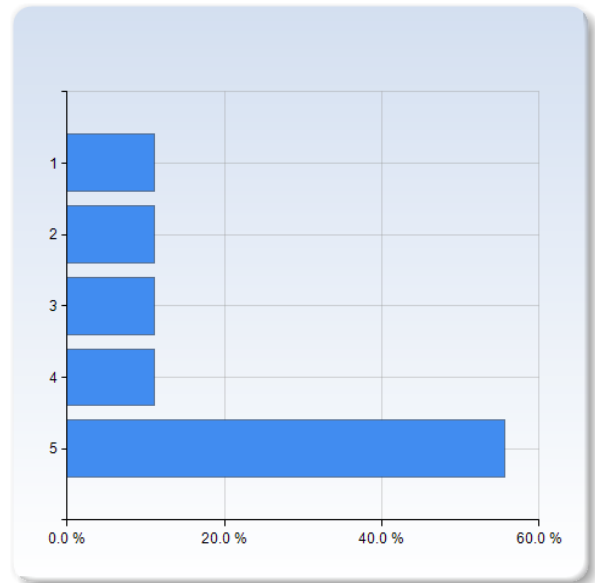
The lectures (recorded) were valuable for my learning.	Number of Responses
1	1 (11.1%)
2	0 (0.0%)
3	0 (0.0%)
4	2 (22.2%)
5	6 (66.7%)
Total	9 (100.0%)



	Mean	Standard Deviation
The lectures (recorded) were valuable for my learning.	4.3	1.3

The seminars were valuable for my learning.

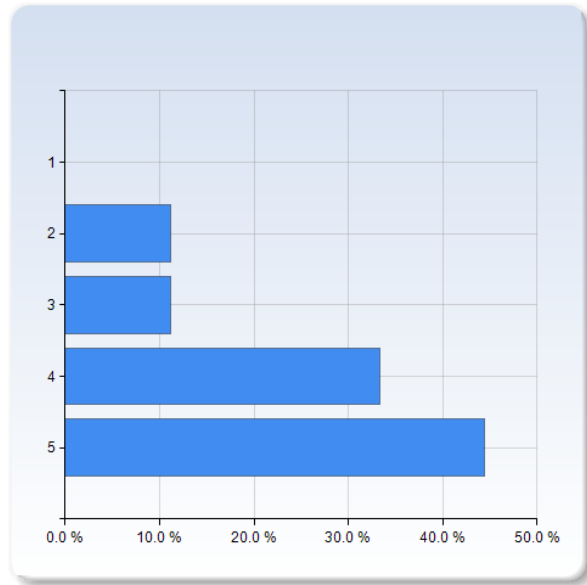
The seminars were valuable for my learning.	Number of Responses
1	1 (11.1%)
2	1 (11.1%)
3	1 (11.1%)
4	1 (11.1%)
5	5 (55.6%)
Total	9 (100.0%)



	Mean	Standard Deviation
The seminars were valuable for my learning.	3.9	1.5

The written assignments were valuable for my learning.

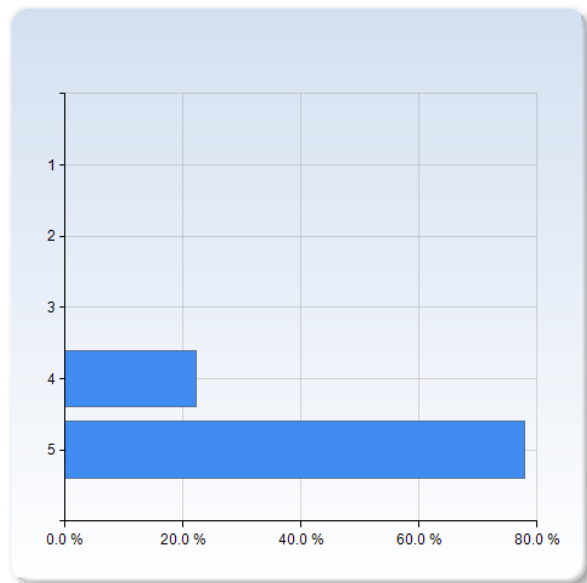
The written assignments were valuable for my learning.	Number of Responses
1	0 (0.0%)
2	1 (11.1%)
3	1 (11.1%)
4	3 (33.3%)
5	4 (44.4%)
Total	9 (100.0%)



The written assignments were valuable for my learning.	Mean	Standard Deviation
	4.1	1.1

Studying on my own was valuable for my learning.

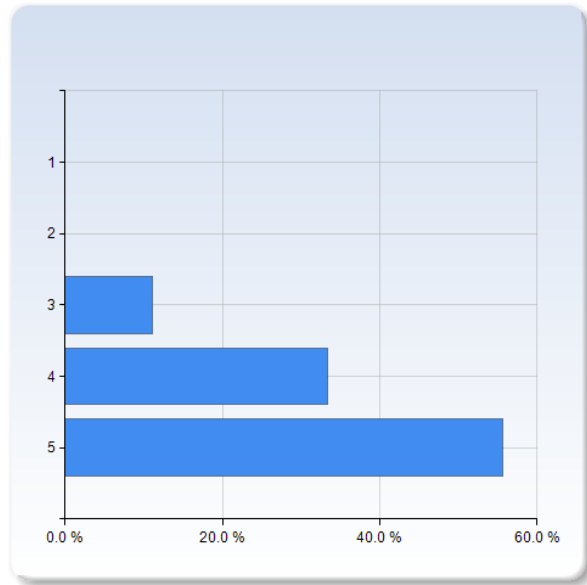
Studying on my own was valuable for my learning.	Number of Responses
1	0 (0.0%)
2	0 (0.0%)
3	0 (0.0%)
4	2 (22.2%)
5	7 (77.8%)
Total	9 (100.0%)



Studying on my own was valuable for my learning.	Mean	Standard Deviation
	4.8	0.4

The course literature/material was a valuable learning resource.

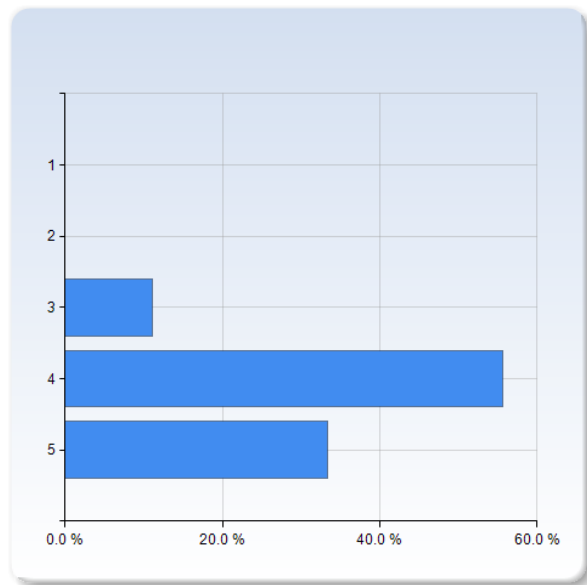
The course literature/material was a valuable learning resource.	Number of Responses
1	0 (0.0%)
2	0 (0.0%)
3	1 (11.1%)
4	3 (33.3%)
5	5 (55.6%)
Total	9 (100.0%)



The course literature/material was a valuable learning resource.	Mean	Standard Deviation
	4.4	0.7

The information I received before the course start was satisfactory.

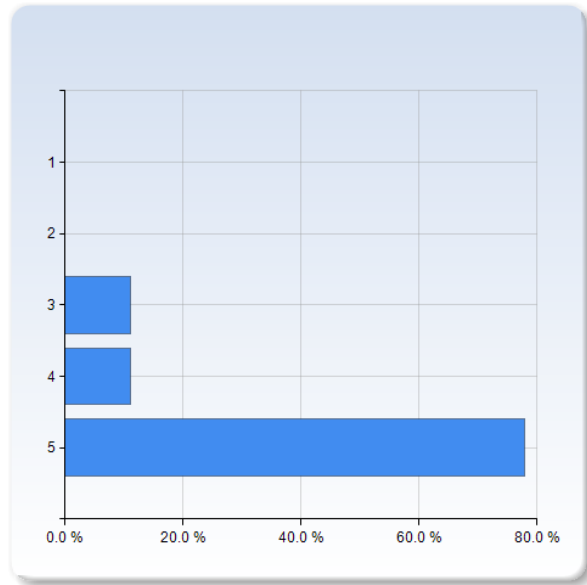
The information I received before the course start was satisfactory.	Number of Responses
1	0 (0.0%)
2	0 (0.0%)
3	1 (11.1%)
4	5 (55.6%)
5	3 (33.3%)
Total	9 (100.0%)



The information I received before the course start was satisfactory.	Mean	Standard Deviation
	4.2	0.7

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

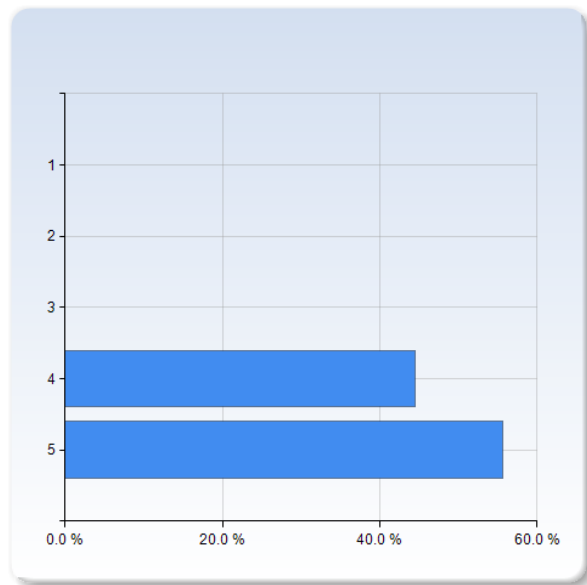
The communication with the teaching staff during the course was good.	Number of Responses
1	0 (0.0%)
2	0 (0.0%)
3	1 (11.1%)
4	1 (11.1%)
5	7 (77.8%)
Total	9 (100.0%)



The communication with the teaching staff during the course was good.	Mean	Standard Deviation
	4.7	0.7

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

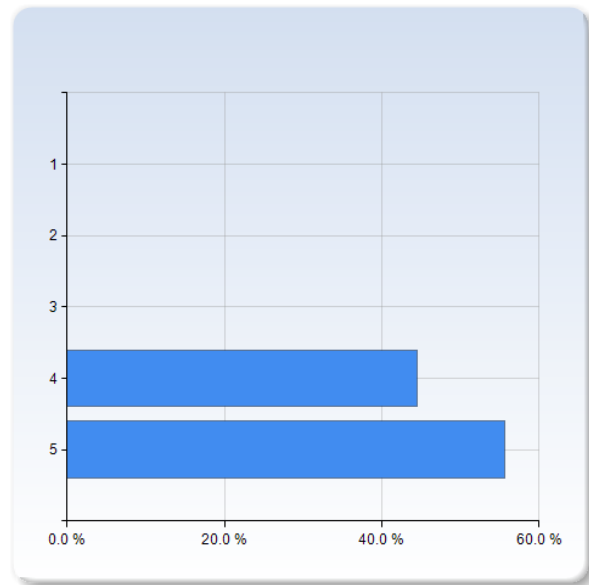
It was clear throughout the course what was expected of me.	Number of Responses
1	0 (0.0%)
2	0 (0.0%)
3	0 (0.0%)
4	4 (44.4%)
5	5 (55.6%)
Total	9 (100.0%)



It was clear throughout the course what was expected of me.	Mean	Standard Deviation
	4.6	0.5

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

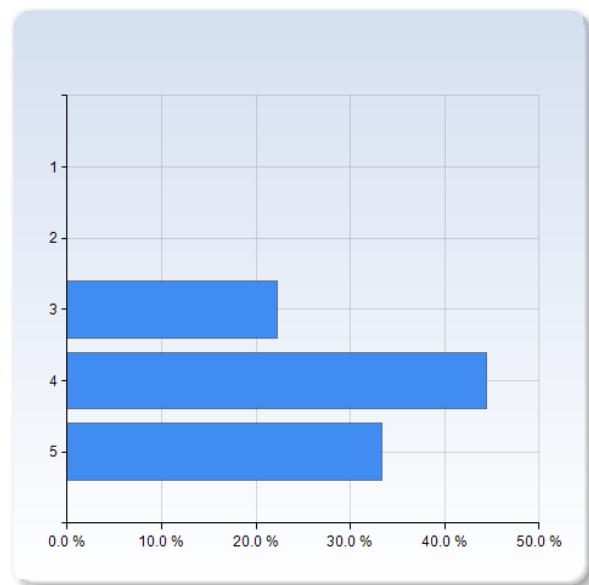
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I have received valuable feedback from my teacher/teachers during the course.	Mean	Standard Deviation
	4.6	0.5

The course had a reasonable workload.

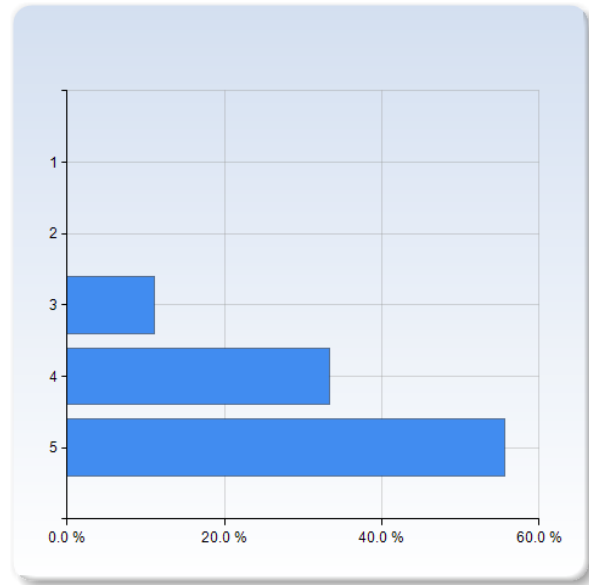
The course had a reasonable workload.	Number of Responses
1	0 (0.0%)
2	0 (0.0%)
3	2 (22.2%)
4	4 (44.4%)
5	3 (33.3%)
Total	9 (100.0%)



The course had a reasonable workload.	Mean	Standard Deviation
	4.1	0.8

The workload was evenly distributed throughout the course.

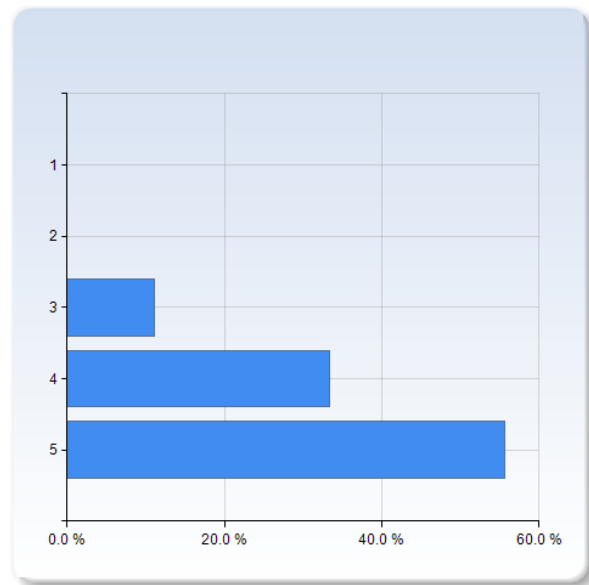
The workload was evenly distributed throughout the course.	Number of Responses
1	0 (0.0%)
2	0 (0.0%)
3	1 (11.1%)
4	3 (33.3%)
5	5 (55.6%)
Total	9 (100.0%)



	Mean	Standard Deviation
The workload was evenly distributed throughout the course.	4.4	0.7

The examination matched the contents and level of the course.

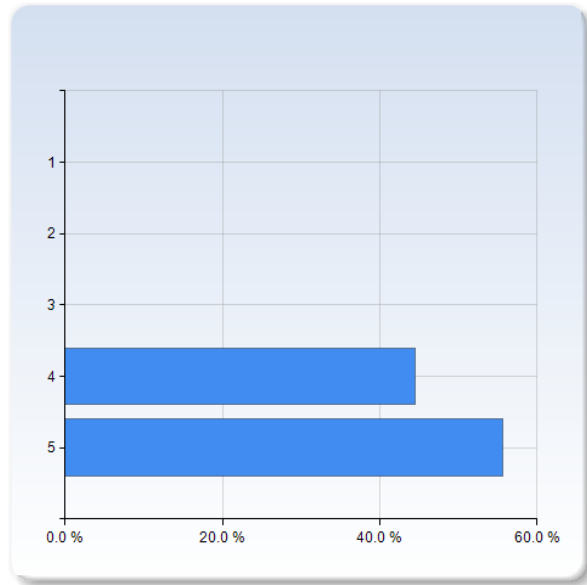
The examination matched the contents and level of the course.	Number of Responses
1	0 (0.0%)
2	0 (0.0%)
3	1 (11.1%)
4	3 (33.3%)
5	5 (55.6%)
Total	9 (100.0%)



	Mean	Standard Deviation
The examination matched the contents and level of the course.	4.4	0.7

Overall, I am satisfied with the course.

Overall, I am satisfied with the course.	Number of Responses
1	0 (0.0%)
2	0 (0.0%)
3	0 (0.0%)
4	4 (44.4%)
5	5 (55.6%)
Total	9 (100.0%)

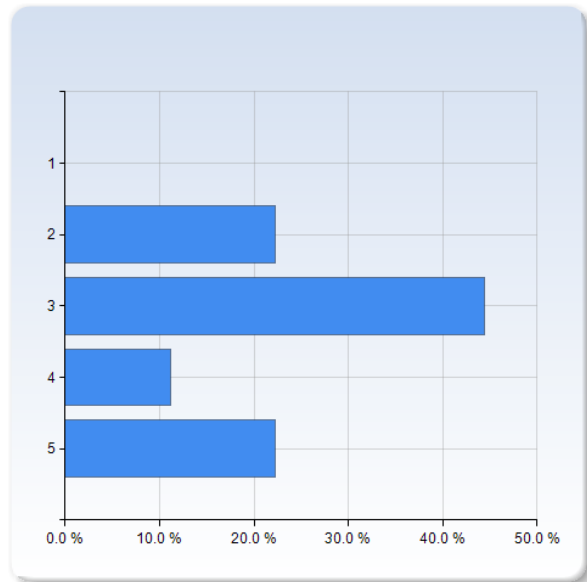


	Mean	Standard Deviation
Overall, I am satisfied with the course.	4.6	0.5

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.

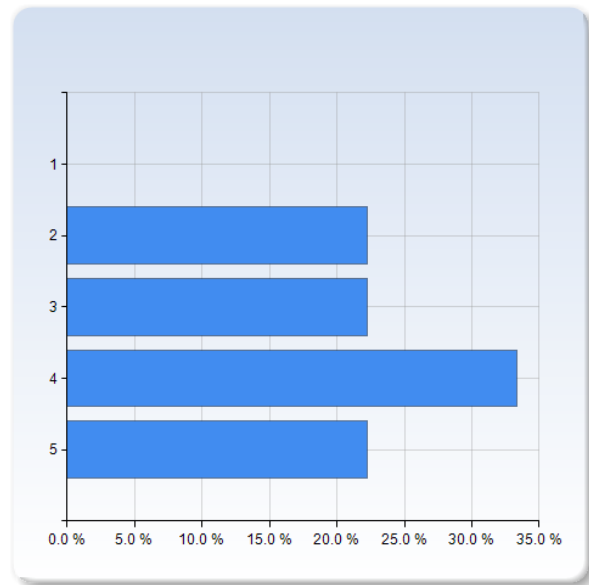
The course has increased my ability to read a mathematical text.	Number of Responses
1	0 (0.0%)
2	2 (22.2%)
3	4 (44.4%)
4	1 (11.1%)
5	2 (22.2%)
Total	9 (100.0%)



	Mean	Standard Deviation
The course has increased my ability to read a mathematical text.	3.3	1.1

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

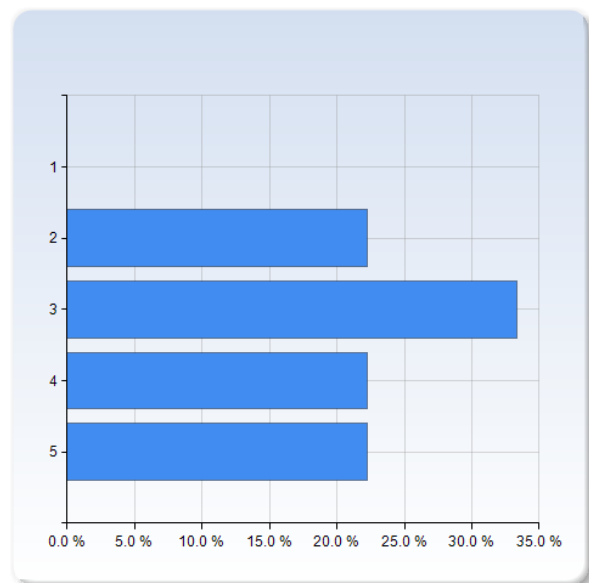
The course has increased my ability to communicate the subject in writing.	Number of Responses
1	0 (0.0%)
2	2 (22.2%)
3	2 (22.2%)
4	3 (33.3%)
5	2 (22.2%)
Total	9 (100.0%)



	Mean	Standard Deviation
The course has increased my ability to communicate the subject in writing.	3.6	1.1

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

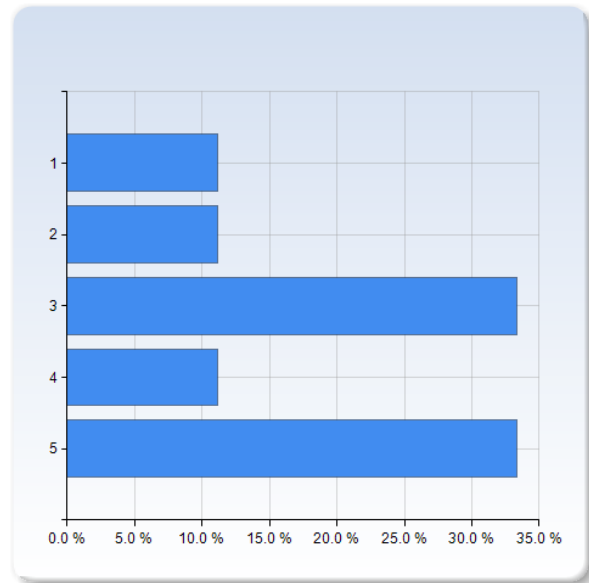
The course has increased my ability to communicate the subject orally.	Number of Responses
1	0 (0.0%)
2	2 (22.2%)
3	3 (33.3%)
4	2 (22.2%)
5	2 (22.2%)
Total	9 (100.0%)



	Mean	Standard Deviation
The course has increased my ability to communicate the subject orally.	3.4	1.1

The course has increased my ability to cooperate.

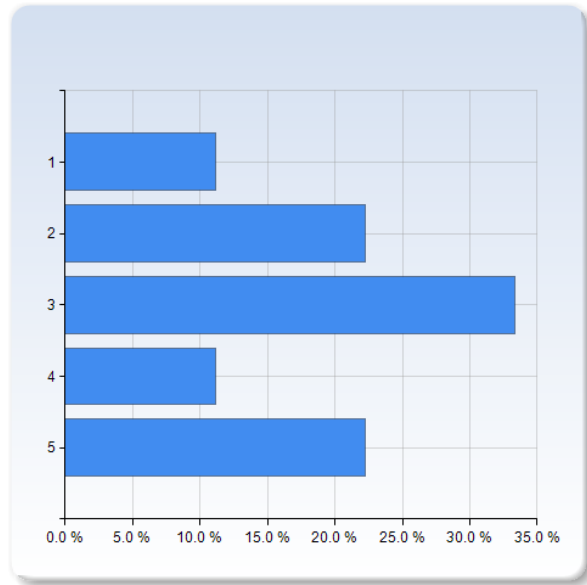
The course has increased my ability to cooperate.	Number of Responses
1	1 (11.1%)
2	1 (11.1%)
3	3 (33.3%)
4	1 (11.1%)
5	3 (33.3%)
Total	9 (100.0%)



	Mean	Standard Deviation
The course has increased my ability to cooperate.	3.4	1.4

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

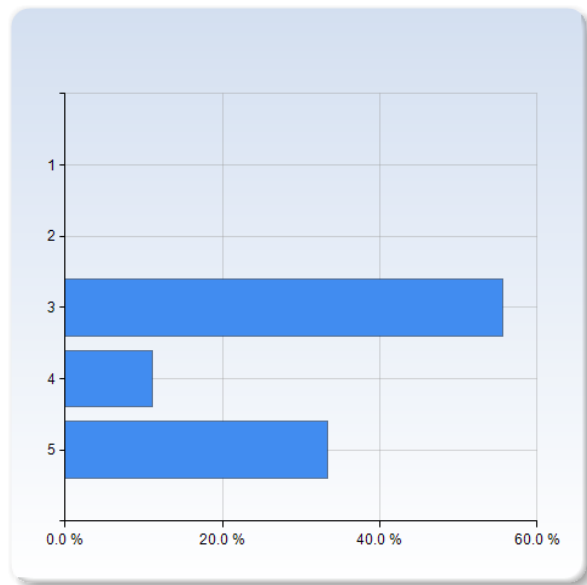
The course has increased my ability to search and process information.	Number of Responses
1	1 (11.1%)
2	2 (22.2%)
3	3 (33.3%)
4	1 (11.1%)
5	2 (22.2%)
Total	9 (100.0%)



The course has increased my ability to search and process information.	Mean	Standard Deviation
	3.1	1.4

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

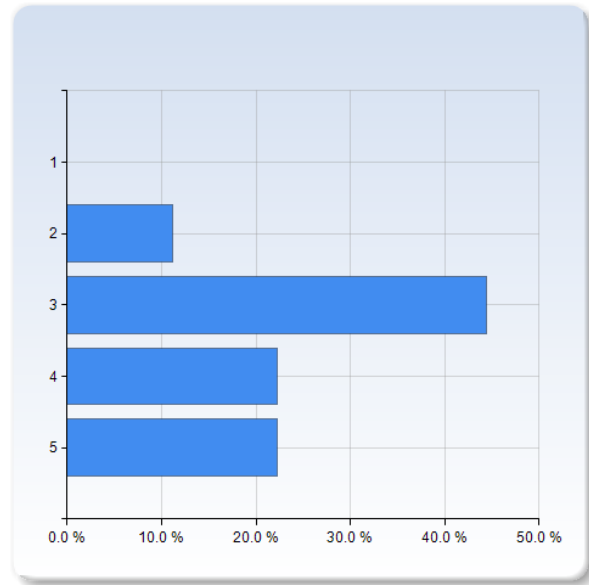
The course has increased my ability to analyze and solve problems.	Number of Responses
1	0 (0.0%)
2	0 (0.0%)
3	5 (55.6%)
4	1 (11.1%)
5	3 (33.3%)
Total	9 (100.0%)



The course has increased my ability to analyze and solve problems.	Mean	Standard Deviation
	3.8	1.0

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	1 (11.1%)
3	4 (44.4%)
4	2 (22.2%)
5	2 (22.2%)
Total	9 (100.0%)



	Mean	Standard Deviation
As a result of this course, I feel confident about tackling unfamiliar problems.	3.6	1.0

What did you appreciate most with the course?

What did you appreciate most with the course?

Everything

Review of previous lecture.

I liked that we had the option of asking questions on Piazza.

The course was fantastically structured on canvas, given the covid environment it was taught in. JFO is one of the best lecturer at the faculty and very knowledgeable about the subject.

The teacher was actively involved in giving us feedback and help. The lectures were also well-structured and he explained the material well.

The abundance educational resources: the recorded lectures (when they were all made public), books, course notes/commentary on book, etc.

The lectures are very interesting and I learnt a lot from them. Talking about research related to the course material is something I wish more teachers would do.

What do you think should be improved?

What do you think should be improved?

Hopefully we won't be online next year anyway

Riemann integral -> Lebesgue integral

I wish we had "hand written" course literature like in one variable calculus or any of Kjells courses. The lecture notes were great and if all material was presented that way it would have been awesome.

This was the first time it was taught in a new version. Make it more clear the "path" one wants to go (working with M or M1 M2 or maybe even L1 L2). Was a little bit unclear in the beginning. I am convinced this will be improved if JFO teaches this course again.

The recorded lectures were made private right before the new lectures. If the teacher decides to do the same in the future, I think it would be better if two lectures or so at a time were kept open. I sometimes would have liked to be able to rewatch the lectures we had during the week during the weekend.

The sole issue with the course was a slight lack of direction in the structure of the curriculum, notably business with "omitting" Lebesgue integration; additionally the course chapters were also presented a little impromptu, such as the sudden disappearance of Fourier analysis on \mathbb{R}^n and Dirichlet's Theorem (not that this was in any way a big issue but I think it was somewhat indicative of this being the first time the course was done in the current incarnation). Finally, the fact that the (lecture/lecture notes) treated things somewhat differently than the book was also a minor inconvenience as it was a little unpleasant to constantly alternate between say "moderate decrease" and "M1, M2", and for instance the differing emphasis put on convolutions in the course versus in the book when considering Fourier analysis on the real line. (Although this mostly only applies to the Fourier Analysis on \mathbb{R} chapter).

The written exam was far too stressful: at several points I nearly gave up so I could do the retake in August which would hopefully have a more reasonable workload. I understand that this is to prevent collaboration, but this took it too far in my experience and the same result could have been achieved with a bit more reasonable workload or in some other way. No other course take this approach as far as I know. Some of the most important parts of doing mathematics are being careful and precise and checking your work, but there was no time for that. Don't throw the baby out with the bathwater.

Have you during this course experienced course literature, staff or teaching methods to be discriminatory in any way (gender, ethnicity, etc.)?

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