

## MAE4110/UV9292 – Measurement models – Periodic evaluation – Spring 2019

### Course evaluation:

The course was offered for the first time in Spring 2019. The final number of participant students was 16, which 13 enrolled in the master's level course MAE4110 and 3 for in the UV9292. The course combined eight lectures, six computer labs and three seminars from February 11 to April 5.

The course contents were divided in five topics: 1. Overview of Latent Variable Models and Measurement Error; 2. Confirmatory Factor Analysis; 3. Exploratory Factor Analysis; 4. Multiple-Group Confirmatory Factor Analysis; 5. Higher-Order models. At the end of each topic, an informal evaluation was conducted anonymously via Nettskjema. In this evaluation, students had the opportunity to reflect about the course pace, difficulty level and resources. These forms had low response rates, varying from 6% to 31%. Appendix 1 presents students' responses for topics 1 to 3 with response rate above 18%.

Additional to the topic's evaluation, a midway assessment was conducted in March also via Nettskjema and consisted of four parts: *Course topic emphasis*, *Work load*, *Assignments* and *Overall*. The response rate was 75%. Appendix 1 also shows student's responses to this form.

The final evaluation consisted of an improved version of the midway questionnaire, including information about student's evaluation of the course exam. This evaluation was conducted in May before the exam results were given. The response rate was 43% and the results are presented in the Appendix 2.

### General comments:

- For the next year, this course will be changed from 5 to 10 ECTS and it will be merged with the MAE4111 (Structural Models) course.
- A more coordinated schedule of the courses' activities is planned at the faculty level to avoid overlap of assignments and exams across courses.

**Appendix 1:**  
**Topic and Midway**  
**Evaluations**

**Topic evaluation:**

I think the pace of the course's topic was:

	Much too fast	Too fast	Just right	Too slow	Much too slow
Topic 1	0 (0%)	3 (60%)	2 (40%)	0 (0%)	0 (0%)
Topic 2	0 (0%)	2 (40%)	3 (60%)	0 (0%)	0 (0%)
Topic 3	0 (0%)	1 (33%)	2 (67%)	0 (0%)	0 (0%)

I think the difficulty level of the topic was:

	Much too fast	Too fast	Just right	Too slow	Much too slow
Topic 1	0 (0%)	2 (40%)	3 (60%)	0 (0%)	0 (0%)
Topic 2	0 (0%)	2 (40%)	3 (60%)	0 (0%)	0 (0%)
Topic 3	0 (0%)	1 (33%)	2 (67%)	0 (0%)	0 (0%)

Tell us what you liked about the topic (lectures, reading list, resources on Canvas).

Comments	
Topic 1	resources on Canvas = excellent; lecturer very enthusiastic; good structure I can't pinpoint something specific yet. Everything seems fine.
Topic 2	It was helpful to find out more about the math behind CFA. resources on Canvas excellent, lecturer energetic and positive, labs good as focuses on interpretation more than R the evaluation of the model, the enthusiasm, the podcast, slide is informative. I think the book is clearly written and not difficult to read. Lectures are well prepared and the following materials are very useful.
Topic 3	Resources on Canvas, well structured lectures The lectures were divided into two lectures

Tell us what we need to improve about the topic (lectures, reading list, resources on Canvas)

Comments	
Topic 1	reading list a bit overwhelming, but good It could be a quite a bit to read every week, but the literature and the lectures are so good.
Topic 2	If the time allows, a separate session(s) on mathematical component could be beneficial. can you share the lecture slides just before the lecture starts more detailed on the interpretation, spend a good amount of time in here, making sure everybody are following is important. The pace is just slightly too fast. If there is no changes on the slide, it is preferable for me personally that the slide to be made available on canvas during the lecture, so if it is too fast we can still see them on our own screen. It really helps for me to follow your pace if I also have the slide on my computer. 5 assignments are great, but maybe should be divided in a smaller chunks. For 10 credits lecturers usually give 3 assignments, this one is 5 credit 5 assignments. So please, smaller chunks of work to compensate for the higher number of assignment. Thank you.

## Rapport fra «MAE4110/UV9292 - Measurement models: Course Midway-Evaluation»

Innhentede svar pr. 13. mars 2019 11:17

- Leverte svar: **12**
- Påbegynte svar: **0**
- Antall invitasjoner sendt: **33**

### Med fritekstsvaer

Students are an important source of information about the effectiveness of the course and its instructors. Please, respond candidly to the following questions. You are particularly encouraged to offer constructive suggestions that may help to improve the quality both of the course and the instruction.

To what extent do you agree with the following statements?

### Svar fordelt på antall

	Strongly agree	Agree	Disagree	Strongly disagree
The information provided on the UiO course page is sufficiently clear	2	9	1	0
The information provided on the CANVAS course page is sufficiently clear	4	8	0	0
The learning outcomes of the course have been met so far	5	6	1	0
The connections between the different course modules are clear	5	7	0	0
The instructor(s) explains the topics clearly	3	6	3	0
The instructor(s) demonstrates concern about whether I am learning	6	5	1	0
The instructor(s) inspires and motivates me and encouraged my interest in the course content	4	8	0	0
The speed at which the course proceeded is exactly right for me	2	2	5	3
The course is improving my critical thinking skills	1	9	2	0
The podcasts are contributing to my learning goals	3	6	3	0

### Svar fordelt på prosent

	Strongly agree	Agree	Disagree	Strongly disagree
The information provided on the UiO course page is sufficiently clear	16,7 %	75 %	8,3 %	0 %
The information provided on the CANVAS course page is sufficiently clear	33,3 %	66,7 %	0 %	0 %
The learning outcomes of the course have been met so far	41,7 %	50 %	8,3 %	0 %
The connections between the different course modules are clear	41,7 %	58,3 %	0 %	0 %
The instructor(s) explains the topics clearly	25 %	50 %	25 %	0 %
The instructor(s) demonstrates concern about whether I am learning	50 %	41,7 %	8,3 %	0 %
The instructor(s) inspires and motivates me and encouraged my interest in the course content	33,3 %	66,7 %	0 %	0 %
The speed at which the course proceeded is exactly right for me	16,7 %	16,7 %	41,7 %	25 %
The course is improving my critical thinking skills	8,3 %	75 %	16,7 %	0 %
The podcasts are contributing to my learning goals	25 %	50 %	25 %	0 %

### Comment space if you want to clarify your responses

- Too many information at the same time, not enough time to read the whole pensum, overwhelming formula, speed in presentation is a bit better, but still too fast contributing to some unclarities, sometimes it is good to pause and ask if we have any questions before continue.
- speed is affected by amount material (readings, assignments included)
- Did not make time for the podcasts yet but am planning on using them.
- It would be really helpful if the lecture and lab PDFs could be labeled numerically and titled, if possible. For example "Lecture 5 - EFA Part II - 12/3/2019" ... I know this is a very small detail but it would help tremendously when it comes to sorting through different files looking for a particular topic or date.
- The course content seems inappropriately large for a 5 credit course.
- The progress of the course is fast, but every topic is still explained carefully, so the speed is not problematic.
- The amount of assignments makes it harder to find time to read and study the literature that is part of this course. Especially because there is so many overlapping deadlines between courses these days. Hence, the speed of the course is hard to adapt to.
- Very dedicated teacher - must have spent a lot of time preparing. Excellently structured.

### Course Topics Emphasis

**Are there topics that would need to be de/emphasized or that you feel are missing from the course?**

- some of us need to learn the parameter calculation in a slower manner than others, it is really super scary in the beginning.
- Adjust the CFA topic based on what has been covered to focus more on what was not covered
- matrix calculating could get some extra time if it is needed.
- The course should either be reduced in scope or reclassified as a 10 credit course.
- I think the topics are presented in a reasonable manner and the labs are a good way to get hands-on experience with what we are taught in the lectures. I also like the professors enthusiasm for the subject.

**Work Load****How much time did you spend approximately per day/per week working for the course?**

- Approximately 40 hours a week (including weekend)
- 4 hours/day, sometimes more
- 20hrs
- now 20 hours per week. this will increase when studying for the exam.
- Approx 2 hours a day and approximately 10-15 hours on each assignment.
- Cannot specify the number of hours spent as a whole; weekly assignments do tend to take up a very long time.
- Approximately 35 hours a week are spent between doing assignments, reading course material, and preparing presentations. This is in addition to 6+ hours a week spent on lectures and seminars.
- Approximately 8-10 hours per week, I feel it is somewhat not sufficient but simply can't find more time to devote to this course because of the high workload in other courses.
- Approximately 5-10 hours per week. Including lectures and exercises.
- 15-20 hours/week

Note that 1 ECTS stands for approximately 25-30 hours. This course is listed as 5ECTS worth.

**Assignments**

Please comment on strength and weaknesses of the assignments you have received so far (e.g., difficulty, length, frequency, effectiveness)

**Weaknesses:**

- Too fast, too much workload
- The first assignment is a lot, the second one is better. Preferably shorter in length of sub-questions (abcde), so we can explore more on our answer. But not sure whether we should or not, or whether a short and concise answer is preferred by the lecturer. I did not get this from the instruction but I guess 2 pages limit says it all. The first assignment and presentation were a nerve-wrecking because we do not know what to expect from lecturer's reaction and evaluation. It is too frequent, no time to actually read the whole pensum and direct all energy to assignment, so exhausted. I am not sure how effective for us to do presentation every week. This is also a lot of work to put together. We have to meet half way where we really understand and learning at a good pace, plus good amount of assignment and deadlines that do not suffocate would be nice, and more coordination with other course's deadline.
- Number of assignments. Example given overlap with principles of measurement would have been more appropriate to collapse assignment 1 and 2.
- amount of introduced info is quite a lot. Waldirs seminar info on matrices was very welcome, but I would have preferred a little more time for it so it was not as rushed and I did not have enough time to actually look at the equations. The constant assignments keep the feeling of not having enough time
- Assignments, although very helpful to cement the material, tend so far to take considerably more time each week than could be expected. It may be appropriate to reconsider the number of assignments for a 5 credit course. Assignments for different subjects seem to overlap as well which creates a lot of anxiety.
- Unclear instructions. Additional assignment given as punishment for failing an assignment. No possible way to resubmit in order to get assignment approved.
- The length and frequency of the assignments can be a bit overwhelming when taking the course beside fulltime work (not as a master student). As they are not mandatory, it is not really a problem though.
- Assignment 1 and 2 should have been combined together. In my opinion this would give students more time to focus more extensively on the course as a whole. Furthermore, assignment 1 and 2 focused on the same datasets and by doubling the amount of page requirements (i.e from 2 pages of text to 4, and 3 tables and figures to 6) and giving students more than 1 week to work on the assignment, prepare presentation and presenting it could be beneficial.
- Time consuming (but strengths makes up for that)

**Strengths:**

- Steep learningcurve, i feel like im Learning a lot
- It helps to understand the material a bit better. The lab was good for training. The lecturer is very enthusiastic about the course, hope someday to match the level of enthusiasm, but it has been difficult, I think mostly because this is a rather uneasy topic and demanding assignments.
- Labs are well structured to understand concepts and prepare for assignments
- little pieces of extra background that make it easier to understand are good. very involved teacher. The labs are great! very structured, I like this way of working and also having time to discuss in groups
- A very structured format is a nice touch.
- Practice reinforcing what we do in labs.
- Aside from the time aspect, the assignments have been good so far. Very useful for practice and reflection even if not completing the report.
- The assignments provides a chance to learn how to use very useful analysis techniques for future research and gives a good impression of what is most needed to report on in a paper.
- Focus on content, not R. Enjoy the division between group work and individual work. Clearly defined tasks. Difficulty about right. Excellent with template for assignment so that it's easier to know what is expected. Learns a lot.

**OVERALL****Strengths and/or elements to retain**

- Many sorted out elements like seminars, presentation, podcasts of the course are helpful. But i have little time to read the Reading list, too busy to Catch up everything.
- lab/exercise style, the small information on the slide for fit indices.
- Slides are very clear and the pace of the labs very appropriate
- labs are good. it's interesting, and at a good pace to follow. Vibe from the teacher is also amazing! Assignment topics are very relevant, and easy to link to what we learned in the lectures. also nice that it is related to interesting and fun datasets to work with, because adding on to 1 specific topic like this is more interesting than different 'random' numbers.
- I am very thankful that so much effort is put into making resources available for us, such as the podcasts, Best Slides Ever, etc. Also, many of us have questions and we have not mastered the material, but we are more comfortable asking professors and assistant professors privately, instead of posting onto a

public forum like the discussion board. Just wanted to clarify that the lack of activity on discussion board isn't because we have mastered the material :)

- Labs are very informative and in my opinion, should be continued in the same format.
- The basic structure.
- There is a good mix of theory and hands-on work. Clear overview of each topic and the related literature. Having a highly engaged and positive instructor is very motivating. Good follow-up with additional content on canvas. The coloured notes for "voting" in class is a nice touch.
- The professors enthusiasm and ability to engage students in the classroom is great. I also appreciate the possibility to be able to ask about whatever I wonder about and getting clear answers back. This concerns the teacher assistants as well.
- Excellently structured. Plenty of resources in Canvas. Professor really cares about our progress and that we are all on the same page.

#### Suggestions for improvements

- 5 assignments for 5 credit are way too much. The workload is overwhelming. Maybe this course should be for 10 credit Points or spreaded out for a longer period through out the semester so that we can have time to read for ourselves and Digest the stuffs.
- Please give us some suggestion about how to master the reading materials, because time-wise it will be impossible to read them all. The language is clear, but the amount of pages are abundance, and sometimes it gets very technical too, and how to absorb everything at the same time.
- Either make it a 10 credits course or reduce material because amount of material covered is not reflective of a 5 credit course
- The way the assignments are given now does not match well with other course deadlines and gives a rushed feeling, even though I do find the topics very well related to the lectures and labs, and they are usefull! perhaps combining the assignments into 3 elements instead of 5. and giving a pass/fail per assignment, with a do-over, instead of waiting untill later and having to submit an extra assignment. This gives students more room to plan around other courses by themselves and removes some of the uncertainty that is there now.
- Perhaps this is not permitted or too big of a request, but if it's possible to record lectures and post those recordings this would be a really helpful resource. Sometimes the pace of lectures goes too fast and I cannot write down notes fast enough, and wish there was a way for me to go back and capture exactly what was said at a given moment. If this is not permitted for legal/logistical reasons, though, I completely understand.
- Reduce scope or change credit classification. Needs to have assignment deadlines which are better coordinated with other courses in the program. Assignment deadlines hurt the quality of work which students can do.
- I really appreciate all you are doing for this class, and I really like how you're so enthusiastic about the class as well. I am very happy with the class, and thus I decided write some more general comments - This is 5 credit course, and I get why it is a 5 credit course related to its topic. Normally, I appreciate opportunities where we can get feedback very often and have exercises we can do, but within this program with other courses going simultaneously, the workload is overwhelming. This is probably not just a comment for this course but more for the overall course, but I would sincerely ask of you to speak with other professors and revise the schedule. If students are asked to do assignments all the time without any proper break, or time to digest the information, or relax etc., then the whole purpose of education becomes pointless. If people are becoming more discouraged and losing interest in data science just because of the workload and how much this program is putting us through, then I fear that something is going very very wrong.
- Less assignments would be a substantial improvement. This amount is stressful and the worry of potentially having to do an additional sixth assignment if one of the five is incomplete is causing redundant amounts of stress for me and many peers. Why can't we just redo the assignment(s) that is incomplete (which has been the way to do it in Data Science, Principles of Measurement and Item Response Theory)?
- Maybe this course should have more ECTS?

Thank you for participating!

Se nylige endringer i Nettskjema (v571\_0rc1)

# **Appendix 2:**

# **Final Evaluation**

## Report from "MAE4110 / UV9292 - Measurement models: Course Evaluation"

### Obtained answers per May 10, 2019 13:32

- Delivered answers: **7**
- Started answer: **0**
- Number of invitations sent: **32**

### With free text response

Students are an important source of information about the effectiveness of the course and its instructors. Please, respond to the following questions. You are particularly encouraged to offer constructive suggestions that can help improve the quality of the course and the instruction.

To what extent do you agree with the following statements?

### Answer by number

	Strongly agree	Agree	disagree	Strongly disagree
The information provided on the UiO course page was sufficiently clear	1	6	0	0
The information provided on the CANVAS course page was sufficiently clear	1	5	1	0
The learning outcomes of the course were met	2	5	0	0
The connections between the different course modules were clear	3	4	0	0
The instructor (s) explained the topics clearly	0	2	5	0
The instructor (s) showed concern about whether I was learning	4	3	0	0
The instructor (s) inspired and motivated me and encouraged my interest in the course content	0	6	1	0
The speed at which the course proceeded was exactly right for me	0	3	3	1
The course improved my critical thinking skills	1	4	2	0
The podcasts contributed to my learning goals	1	4	1	1
I would recommend this course	1	6	0	0

### Answer by percent

	Strongly agree	Agree	disagree	Strongly disagree
The information provided on the UiO course page was sufficiently clear	14.3%	85.7%	0%	0%
The information provided on the CANVAS course page was sufficiently clear	14,3 %	71,4 %	14,3 %	0 %
The learning outcomes of the course were met	28,6 %	71,4 %	0 %	0 %
The connections between the different course modules were clear	42,9 %	57,1 %	0 %	0 %
The instructor(s) explained the topics clearly	0 %	28,6 %	71,4 %	0 %
The instructor(s) demonstrated concern about whether I was learning	57,1 %	42,9 %	0 %	0 %
The instructor(s) inspired and motivated me and encouraged my interest in the course content	0 %	85,7 %	14,3 %	0 %
The speed at which the course proceeded was exactly right for me	0 %	42,9 %	42,9 %	14,3 %
The course improved my critical thinking skills	14,3 %	57,1 %	28,6 %	0 %
The podcasts contributed to my learning goals	14,3 %	57,1 %	14,3 %	14,3 %
I would recommend this course	14,3 %	85,7 %	0 %	0 %

### Comment space if you want to clarify your responses

- "The speed at which the course proceeded was exactly right for me" Some sections of the course were explained in detail although they didn't seem to be of great importance. Other times, vital subjects didn't get sufficient explanation.
- I am very grateful for the fact that the instructor was cooperative regarding the amount and delegation of assignments. The content was useful and the course was interesting.

### Course Topics Emphasis

Are there topics that would need to be de/emphasized or that you feel are missing from the course?

- A "crash course" or extra sessions dealing with the mathematics and formulas would be very helpful for almost every student in class.

- Since the first two assignments were very similar in terms of topic and content, it could possibly benefit from being combined into one larger assignment after the whole topic of CFA has been covered.

## Work Load

How much time did you spend approximately per day/per week working for the course?

- 25/week
- 20-25 hours a week.
- 5 h + lectures
- 45 hours/week
- 23

Note that 1 ECTS stands for approximately 25-30 hours. This course is listed as 5ECTS worth.

## Assignments

Please comment on strength and weaknesses of the assignments (e.g., difficulty, length, frequency, effectiveness)

### Weaknesses:

- "Extra assignment" system where students who didn't do well enough on assignment had to do an additional assignment at the end of the semester seems more punitive than helpful. Especially since students weren't given the opportunity to redo assignments. Too many assignments as well. For a 5 credit course, the workload was too much.
- Assignment 1 and 2 could have combined as mentioned.
- Lecture, seminar, computer lab, assignment and presentation in a week were a bit too much digest thoroughly. I found it hard to follow up all the stuff with details. I lost the track of reading the literature, because of many due's.
- frequency was originally too much

### Strengths:

- The assignments dealt with important subjects in the course.
- Learnt a lot - both methodology, how to interpret and present results, and how to write a good paper/report
- Very applicable for further practice.
- I could practice writing skills in describing and analysing.
- traces back to content and what was done in labs, it helps to understand the course content

## EXAM

### Svar fordelt på antall

	Strongly agree	Agree	Disagree	Strongly disagree
There was sufficient time to prepare before the scheduled exam	1	2	2	1
There was sufficient a priori information given on the nature of the exam	1	1	3	1
The time to complete the exam was sufficient	3	2	1	0
The exam questions did not come as a surprise to me	1	2	3	0
The exam adequately covered the whole span of the course contents	1	4	1	0
The exam questions were clearly formulated	1	5	0	0
I feel I have a pretty good idea about how I will score on the exam	0	2	4	0

### Svar fordelt på prosent

	Strongly agree	Agree	Disagree	Strongly disagree
There was sufficient time to prepare before the scheduled exam	16,7 %	33,3 %	33,3 %	16,7 %
There was sufficient a priori information given on the nature of the exam	16,7 %	16,7 %	50 %	16,7 %
The time to complete the exam was sufficient	50 %	33,3 %	16,7 %	0 %
The exam questions did not come as a surprise to me	16,7 %	33,3 %	50 %	0 %
The exam adequately covered the whole span of the course contents	16,7 %	66,7 %	16,7 %	0 %
The exam questions were clearly formulated	16,7 %	83,3 %	0 %	0 %
I feel I have a pretty good idea about how I will score on the exam	0 %	33,3 %	66,7 %	0 %

### Comment space if you want to clarify your responses

- "There was sufficient time to prepare before the scheduled exam" The scheduling of exams and assignments across courses was very poorly done. The Measurement models exam was followed by an exam paper in another class and a different assignment for a third class which were due 4 days later. There was seemingly no communication between courses on deadlines. The scheduling of these events may have played a bigger role in how well students did on them than students' ability to learn the subjects.
- Excellent exam - good items, story throughout, covered curriculum in a good way, allowed to have a sheet of formulas
- Three exams clash in one periode could be avoided.
- no code writing expected. Rstudio has a different way that is not possible to recreate in exam setting

## OVERALL

### Strengths and/or elements to retain

- Instructor was clearly enthusiastic and wanted to do a good job.
- Excellently structured course and plenty of extra resources (e.g. PodCasts, calculations). Very enthusiastic lecturer that cared about the students.
- Wrighting 2 page documents for assignments for each topic was Nice to practice.
- enthusiasm!! love the teaching

**Suggestions for improvements**

- Greater coordination on deadlines across courses.
- Help for understanding basic Mathematical/Statistical concepts for build up the course in Whole. At least a guideline where we can start look at first/expected to know regarding this, if it was meant for us to gain this knowledge independently. More detailed explanation and examples of interpretation of results on the PowerPoint slides/lecture materials would be helpful.
- more structure on the slides for rereading it afterwards

Thank you for participating!

[View Recent Changes in Schedule \(v617\\_2rc1\)](#)