# Course analysis SF2493 VT21

## Compiled by

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## Analysis based on

- Course evaluation after the course.
- Results on quizzes, project, and exam.

Students were invited to form a course committee for the course but no students volunteered to do so.

## Course design

The course was given during period 4 in VT21. Due to the ongoing covid-19 pandemic, all aspects of the course were carried out online. Lectures and problem sessions were performed via videoconference, with students able to ask questions in the chat. To allow for self-study, all lectures were also recorded and uploaded to Canvas. Outside of these lectures and problem sessions, students had the ability to ask questions in the online discussion forum on Canvas.

The course consisted of 13 lectures and 8 problem sessions. During the former, an overview of the theory and methods pertaining to a particular subject in the course was given while in the latter, a teaching assistant (Viktor Nilsson) solved problems. Notes from each lecture and problem session was uploaded to the course page as well as relevant notebooks or R scripts.

Each week, the students were also given an online quiz that they could take at a time of their choosing. Each quiz consisted of three multiple-choice problems and the students had fifteen minutes to solve them. Problems were randomized for each quiz in order to deter cheating. Quizzes were well attended, with most of the students taking all six quizzes. Based on their performance, the quizzes then gave bonus points on the final exam.

In addition to the exam, students were also required to complete a two-part project assignment. The first part involved examination and analysis of a time series of their choosing. The second part entailed reading and analyzing a research paper. Both parts of the project were written up into a report and the first part also included an oral presentation in class. As the project assignment was required to pass the course, a majority of students participated in this.

The exam was given online at the end of the period and consisted of two parts, each worth the same number of points. The first part consisted of ten multiple-choice questions (again randomized to deter cheating) while the second part consisted of three problems where the students were asked to provide full solutions. One of these three questions was more theoretical in nature and drew from a list of topics given to the students prior to the exam.

## Course development

- Rewriting of course notes.
- New quiz problems.
- R scripts and notebooks to complement lecture notes.
- Updated references to course textbook.
- Pointers to more advanced topics for motivated students.

## Course results after exam

Percentages are with respect to the number of students who turned in their exams.

| A | B | C | D | E | Fx | F |
|---|---|---|---|---|---|---|
| 13 (15.3%) | 5 (5.9%) | 16 (18.8%) | 12 (14.1%) | 19 (22.4%) | 6 (7.1%) | 14 (16.5%) |

Number of registered students: 123. Number registered for the exam: 112. Number who turned in exam: 85. Total number of passing students: 65 (76.5%).

## Summary of student feedback

After the conclusion of the course, a survey went out to the students. Unfortunately, only 7 students chose to respond (possibly because the course ended before the summer break and therefore many students were not necessarily available to take the survey).

In this survey, however, students indicated that they did not put a significant amount of time into the course, with most spending 3 to 5 hours per week. This is well below what is expected for a 7.5 ECTS course, so if this holds more generally, it would indicate that the course material is not challenging enough for this group of students.

Due to the small sample size and the spread of opinions, it is hard to draw specific conclusions from the survey, but some aspects that students seemed to agree on were: understanding of key concepts was prioritized, course activities aligned with learning outcomes, assessment was fair and honest, background knowledge was sufficient, and students were able to learn by collaborating with others.

Some of the free-form answers indicated disappointment with the style of the lectures and its emphasis on theory, rather than practice. On the other hand, the project portion was very much appreciated for the same reason, in that it allowed the students to test concepts they had learned about and apply them to a topic of their choosing. The students were also appreciative of the lecture videos being made available.

## Summary of course committee meetings

As mentioned above, no students volunteered for these meetings, so none were held.

## Examiner's evaluation

This was the first time the course was given with the current examiner and course responsible, so a signficant amount of work went into understanding the subject and developing the course material (course notes, lecture, problem sessions, etc.). As a result, the lectures and notes were not as polished as they could have been for a more seasoned lecturer in the topic. However, signficant care was still taken to formulate and better convey the intuition of various concepts in the coures. Another drawback of the course was its online format, which proved unrewarding to both teacher and students. The exception to this was the project presentations, where more interaction resulted in an improved learning experience. Finally, the course textbook used in the course is unfortunately of low quality and often adds more confusion in parts of its exposition.

The course can be improved either by more detailed lecture notes which can replace a lot of the textbook material or by choosing another textbook (several options are available here, notably, Shumway & Stoffer, *Time series analysis and its applications*). It is also important to update the core material. Currently, the course focuses on very basic methods (ARMA models, simple inference for AR models, linear prediction, etc.). In many cases, the tasks performed by these methods (prediction) can often be performed by neural network models such as recurrent neural networks (RNNs). It is therefore important to either: motivate the use of these simpler models somehow (limited data, inference as oppposed to prediction, etc.) or to include some of these non-parametric, data-hungry methods into the course. Otherwise, the course risks losing its relevance to the students.