Course analysis
Neuroscience DD2401/3401

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No. of students registered: ~77

The course provides a broad introduction to neuroscience. The aim of the course is to familiarize students with general concepts, key experiments, and computational/theoretical interpretation of experimental data. The course is offered to all MSc students at KTH. Some PhD students also join the course. The key difference between MSc and PhD students is that the latter have to write a long essay on an advanced topic not covered in the course lectures.

Key Challenge

Challenge	Our approach
Selection of topics: Neuroscience is a broad topic, and a typical KTH student has no background in biology. So, students find it daunting to learn a whole new vocabulary. But we do not intend to make our course an exercise in memory and recall. Our main challenge is to select topics which involve a fair bit of conceptual and analytical ideas.	Depending on the response of the students in the previous years we have revised the contents and removed/added new topics. Moreover, in most cases each lecture is combined with some theoretical or computational idea or approach. Each year we update the lecture topics keeping in mind the recent research advances.
Course material: Given the breadth of topics and that we modify course contents regularly, it is rather difficult to find a single course book. I personally think that this is fine for a MSc level course, but I understand that students may struggle to find contents in books.	First, we ensure that all exams. questions are based on lecture slides. This indeed restricts us in setting up the exam. Second, we provide specific chapters from selected books. Third, we provide lecture notes for some of the lectures. And tutorials help a lot in this regard.

Student engagement in the course: I think students come to the course assuming that brain science will inspire machine learning. And they are quickly disillusioned. Therefore usually ~20% of students never take the exam. Among those who stay, only a handful interact with us during lectures.	We have introduced tutorial notebooks. Students can now get to explore a few topics in hands-on tutorial which involve simulation of neurons and networks. These notebooks can be run online without any specific installation locally. We have introduced lectures on topics such as Brain and AI, Neurorobotics. This has attracted many students and it has resulted in students doing their internships or MSc thesis in the field of neuroscience either at KTH or KI We have offer a weekly neuroscience hangout but unfortunately no one joined ever.
Examination: We have been doing an open book/notes examination since 2020. Students however must write their answers in their own handwriting. Moreover, due to the open book nature of the exam, some of the questions are very subjective so it is possible that sometimes grading is not uniform. In addition, grading takes a long time. But students complain that there are too many topics and often the exam time is not sufficient. My experience that they spend too much time searching for the answers.	I remind them of the exam format during the lectures to prepare them that open exams require different kind of preparations. To reduce the workload during exam preparation we publish elective topics for the exams. So students only have to prepare about 80% of the syllabus.

I have not added the course feedback because I think that the feedback is useless. First, only a handful of students respond, and they are usually not the representative samples. I once received rather harsh feedback from a student (as a comment to LEQ) and I discussed it with my colleagues, and they simply advised me to ignore that. Second, the questions that we have in the standard LEQ are pretty much meaningless. I would like to revise that but to hope that same questionnaire can apply to every course is a fallacy. I take feedback from students who are regular in the course, and they do provide useful feedback which reflects in our teaching on lecture-by-lecture basis.

What will be different in 2025

- The course is delivered by experts from KTH, KI and some colleagues from Germany, France, and Japan. This is in some sense the strength of the course. While colleagues from abroad do the lecture pro bono, we must pay to the colleagues from KI. We have been

asked to cut that expense. So in the next year will have more lectures from KTH professors. We hope that this will create some more homogeneity in the course material.

- To have a regular assessment of the students' progress we will introduce quizzes in the class which will give them bonus points for the final exam (but only if they get an E in the written exam.)
- We are also thinking if the exam can be shortened and make it closed book again. But this is still under consideration.

Student performance

Overall, I have been satisfactory with the exam performance (see figure below). But of course we aspire to reduce number of D grades. This year surprisingly only 15 students did not take the exam despite registering.