

# COURSE ANALYSIS, postgraduate course

Third cycle courses, EECS School, KTH, from 2018

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An asterix (\*) denotes non-compulsory data.

## Course data

Course name: Music informatics

Course ID: DT2470

Credits: 7.5

Credits per module: 7.5

Time period for course: HT2024

Teachers: Bob L. T. Sturm and André Holzapfel

Examiner: Sten Ternström

Classroom hours: Almost twice a week for 2 hours

Nr of registered students: 92

Examination rate, in %: 100

## Goals

After passing the course, the student shall be able to

- account for how feature extraction works and explain why it is needed
- recommend methods for comparing and modelling of music data
- design, implement and evaluate own methods for modelling of music data

in order to

- be able to describe how information at different levels of abstraction can be extracted from music data (acoustic as well as symbolic) and be used in many applications (e.g., search, retrieval, synthesis)
- be able to design algorithms for handling and modelling of music data as well as evaluate their performance.

How the course design helps to fulfill these goals: Lectures, weekly quizzes, labs, project and written report

## Pedagogical development - I

Changes made since previous time course was given: None

## Course evaluation; comments from students

Based on the anonymous questionnaire.

Evaluation response rate: 16.3% (15 of 92)

### Overall student view\*

"I felt like the workload was manageable, which gave more opportunity to learn the material and not just stress through it. On the labs we spend about 8 hours per lab, then on the project we spent a lot more time."

"Quite okay load, listening in class is enough to succeed. Labs take much more time than indicated, which is fine given the context."

"Very entertaining lectures, especially the ones that we're live and not on Zoom. I like that the lectures are an introduction to subjects and that labs and the literature was used to actually use ideas and concepts that we're discussed."

"This is probably the most well-designed, balanced course I have taken at KTH. Nothing felt rushed, I felt I received enough information as required. Really interesting to also meet so many interesting people!"

"The most enjoyable course I have taken at KTH (though my interest in music likely colours this assessment)"

**Negative comments:**

"The workload is relatively low."

"I would recommend more connection with the music itself. It appears more like a signal processing course for me, as a student with engineering background."

"I had a lot of trouble understanding the prof because he has an accent I wasn't used to and he speak too fast for me. In that case I was almost not able to understand any of the classes and then it was too hard to follow correctly the course."

**Pre-knowledge, comments\***

"It looks like as a little bit challenging task for some students who have not contacted the area of ML, signal, and musical knowledge before"

"Could be an idea to maybe switch over the MATLAB if there are similar packages there. But for computer science students, maybe this isn't a problem (I'm from mechanics)."

**Course design, comments\***

"I like the open project, where we can explore the interesting topics."

"Have all lectures live is my preference. Hard to follow on Zoom in general especially if the topic is advanced."

"Maybe include more up to date, more advanced topics and ways to solve them."

**Literature, comments:**

"This is not possible to read 60 pages of a very complicated book before every class. This is stressful because you cannot manage to do it."

**Examination, comments:**

"[You need to] Explain the grading system of the course."

## Course teacher's impressions from the evaluation

**Comments:** The student observations align with my own as to what changes should be made in the next edition.

## Course teacher's summary

**Overall view:** There were far too many in the course! Despite this, the course ran smoothly, and pretty much followed the course book. We need three teaching assistants if this course is attending by this many.

**Positive comments:** Attendance was ok throughout the course, taught in a hybrid way. The diversity of projects was good.

**Negative comments:** The grading of the labs needs to be rethought. Also having four students per project group is too many to fairly grade all.

**View on pre-knowledge\*:** Fine

**View on course design\*:** Fine.

**View on course material:** The material is timely and appropriate for the learning objectives. The labs provided hands-on experience.

**View on examination:** Projects provide a good way to gauge mastery.

## Pedagogical development - II

**Outcome of course changes made since last time course was given:**

- **Changes made since previous time course was given:** None

**Changes to be made before next time course is given:**

1. The quizzes need to be made more difficult.
2. Grading will be clearly described at the beginning of the course.
- 3.

## **Other**

**Comments\***

## DT2470 - 2024-10-28

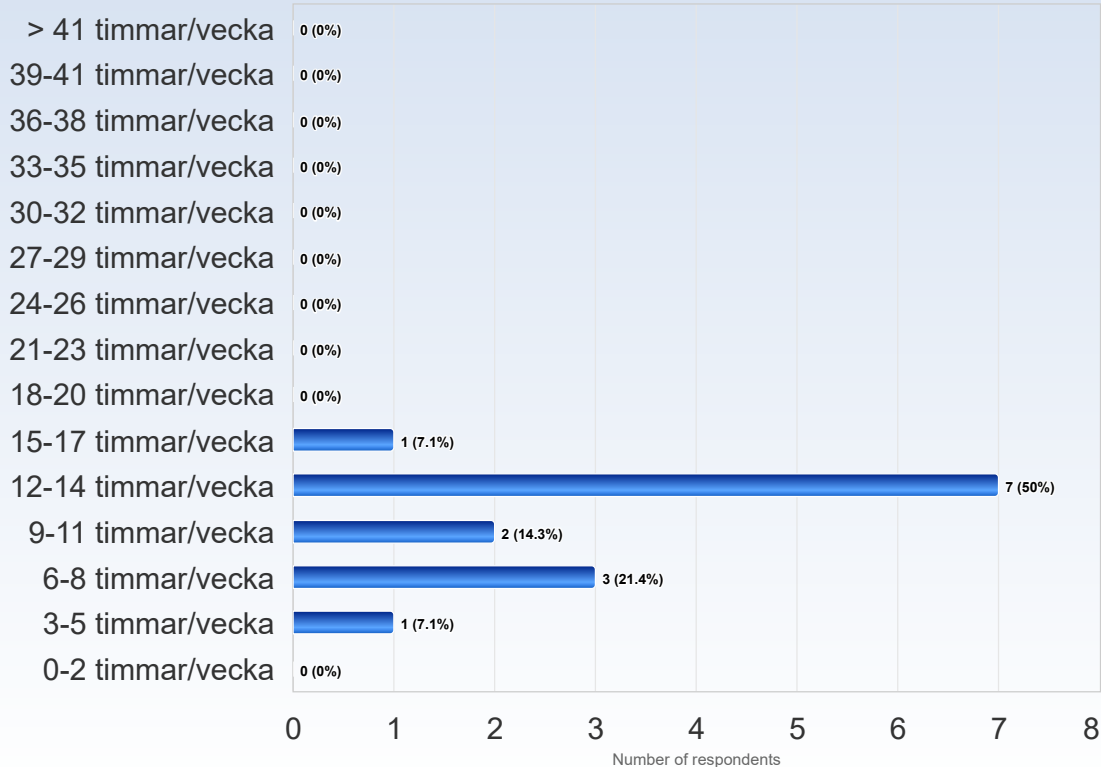
Antal respondenter: 92

Antal svar: 15

Svarsfrekvens: 16,30 %

### ESTIMATED WORKLOAD

On average, how many hours/week did you work with the course (including scheduled hours)?



#### Comments

Comments (I worked: 3-5 timmar/vecka)

The workload is relatively low. Good.

Comments (I worked: 6-8 timmar/vecka)

I have background in machine learning and signal processing. So this course does not require me extra time to study.

Comments (I worked: 9-11 timmar/vecka)

Since I had worked in Python previously and especially in terms of signal processing, some parts of the course we're more easy to understand. Therefore, some of the projects took less time which resulted in less than 20 hrs/week per week. I attended all classes but did not always read all the literature.

Comments (I worked: 12-14 timmar/vecka)

Things probably went a bit faster for my group since my lab partner already had experience in using numpy, librosa, etc.

Quite okay load, listening in class is enough to succeed. Labs take much more time than indicated, which is fine given the context. not that much of workload

I felt like the workload was manageable, which gave more opportunity to learn the material and not just stress through it. On the labs we spend about 8 hours per lab, then on the project we spent a lot more time.

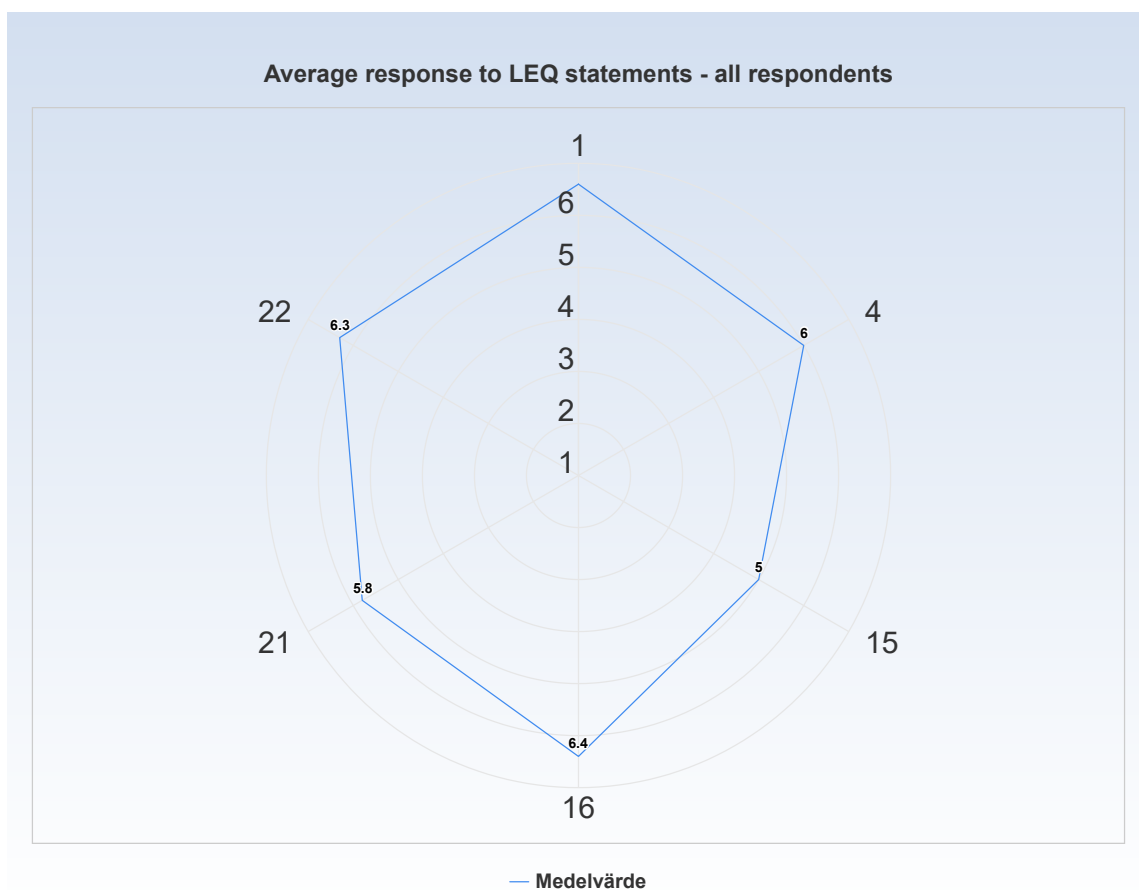
I think the workload was adequate

# LEARNING EXPERIENCE

The polar diagrams below show the average response to the LEQ statements for different groups of respondents (only valid responses are included). The scale that is used in the diagrams is defined by:

- 1 = No, I strongly disagree with the statement
- 4 = I am neutral to the statement
- 7 = Yes, I strongly agree with the statement

**Note! A group has to include at least 3 respondents in order to appear in a diagram.**



## **KTH Learning Experience Questionnaire v3.1.4**

### **Meaningfulness - emotional level**

#### *Stimulating tasks*

1. I worked with interesting issues (a)

#### *Exploration and own experience*

2. I explored parts of the subject on my own (a)
3. I was able to learn by trying out my own ideas (b)

#### *Challenge*

4. The course was challenging in a stimulating way (c)

#### *Belonging*

5. I felt togetherness with others on the course (d)
6. The atmosphere on the course was open and inclusive (d)

### **Comprehensibility - cognitive level**

#### *Clear goals and organization*

7. The intended learning outcomes helped me to understand what I was expected to achieve (e)
8. The course was organized in a way that supported my learning (e)

*Understanding of subject matter*

- 9. I understood what the teachers were talking about (f)
- 10. I was able to learn from concrete examples that I could relate to (g)
- 11. Understanding of key concepts had high priority (h)

### *Constructive alignment*

- 12. The course activities helped me to achieve the intended learning outcomes efficiently (i)
- 13. I understood what I was expected to learn in order to obtain a certain grade (i)

### *Feedback and security*

- 14. I received regular feedback that helped me to see my progress (j)
- 15. I could practice and receive feedback without being graded (j)
- 16. The assessment on the course was fair and honest (k)

## **Manageability - instrumental level**

### *Sufficient background knowledge*

- 17. My background knowledge was sufficient to follow the course (f)

### *Time to reflect*

- 18. I regularly spent time to reflect on what I learned (l)

### *Variation and participation*

- 19. The course activities enabled me to learn in different ways (m)
- 20. I had opportunities to influence the course activities (m)

### *Collaboration*

- 21. I was able to learn by collaborating and discussing with others (n)



## *Support*

22. I was able to get support if I needed it (c)

## **Learning factors from the literature that LEQ intends to examine**

We tend to learn most effectively (in ways that make a sustained, substantial, and positive influence on the way we think, reflect, act or feel) when:

a) We are trying to answer questions, solve problems or acquire skills that we find interesting, exciting or important

b) We are able to speculate, test ideas (intellectually or practically) and learn from experience, even before we know much about the subject

c) We are able to do so in a challenging and at the same time supportive environment

d) We feel that we are part of a community and believe that other people have confidence in our ability to learn

e) We understand the meaning of the intended learning outcomes, how the environment is organized, and what is expected of us

f) We have adequate prior knowledge to deal with the current learning situation

g) We are able to learn inductively by moving from concrete examples and experiences to general principles, rather than the reverse

h) We are challenged to develop a true understanding of key concepts and gradually create a coherent whole from the content

i) We believe that the work we are expected to do will help us to achieve the intended learning outcomes

j) We are able to try, fail, and receive feedback before, and separate from, each summative assessment of our efforts

k) We believe that our work will be considered in an honest and fair way

l) We have sufficient time for learning and devote the time needed to do so

m) We believe that we have control over our own learning, and not that we are being manipulated

n) We are able to collaborate with other learners struggling with the same problems

## Literature

Bain, K. (2004). *What the Best College Teachers Do*, Chapter 5, pp. 98-134. Cambridge: Harvard University Press.

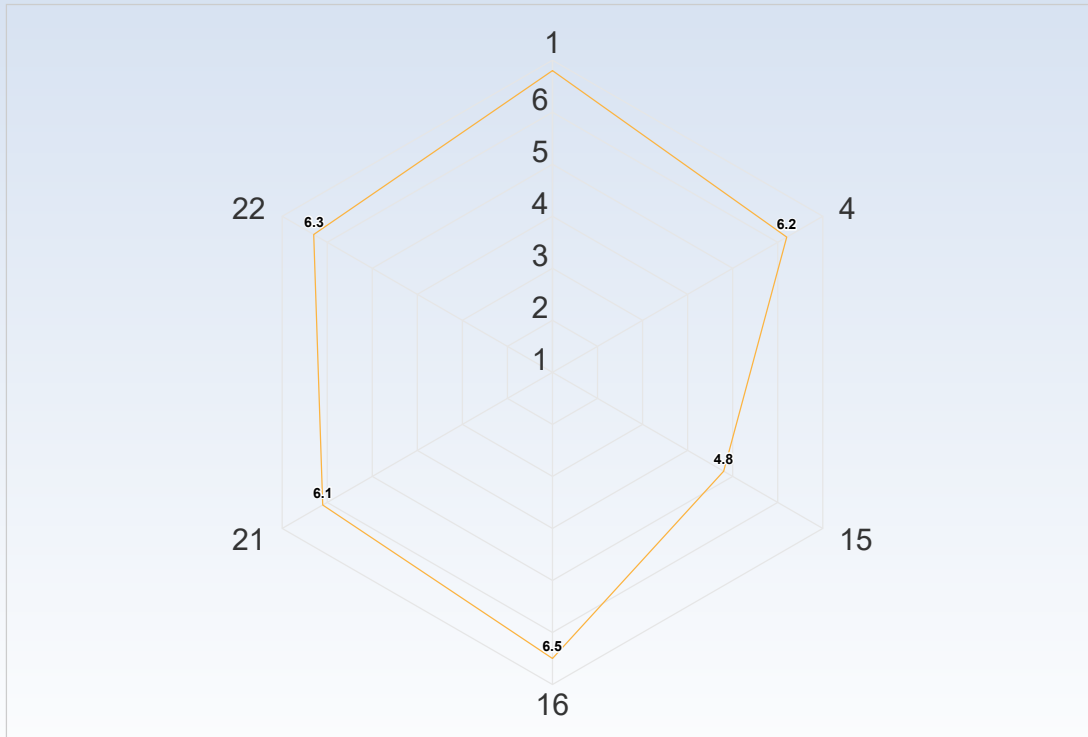
Biggs J. & Tang, C. (2011). *Teaching for Quality Learning at University*, Chapter 6, pp. 95-110. Maidenhead: McGraw Hill.

Elmgren, M. & Henriksson, A-S. (2014). *Academic Teaching*, Chapter 3, pp. 57-72. Lund: Studentlitteratur.

Kember, K. & McNaught, C. (2007). *Enhancing University Teaching: Lessons from Research into Award-Winning Teachers*, Chapter 5, pp. 31-40. Abingdon: Routledge.

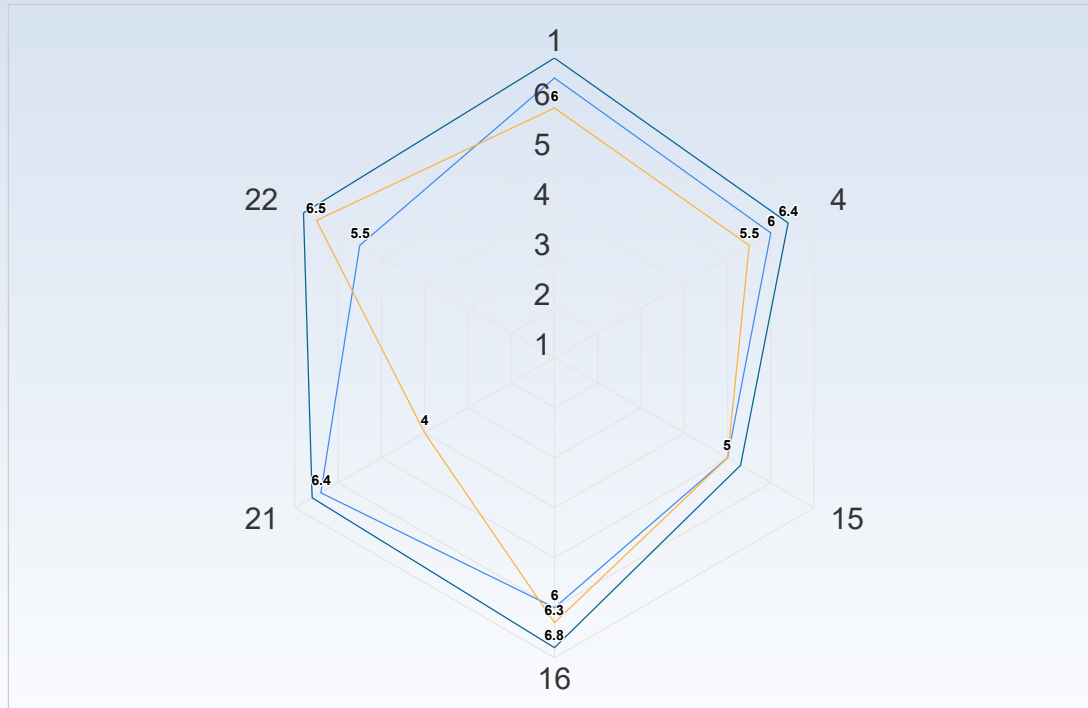
Ramsden, P. (2003). *Learning to Teach in Higher Education*, Chapter 6, pp. 84-105. New York: RoutledgeFalmer.

### Average response to LEQ statements - per gender



— Kvinna — Man — Annat — Vill ej uppge

### Average response to LEQ statements - per type of student



— Internationell masterstudent   
 — Internationell utbytesstudent   
 — Svensk student i årskurs 1-3  
— Svensk student i årskurs 4-5   
 — Annan typ av student   
 — Vill ej uppge

#### Comments

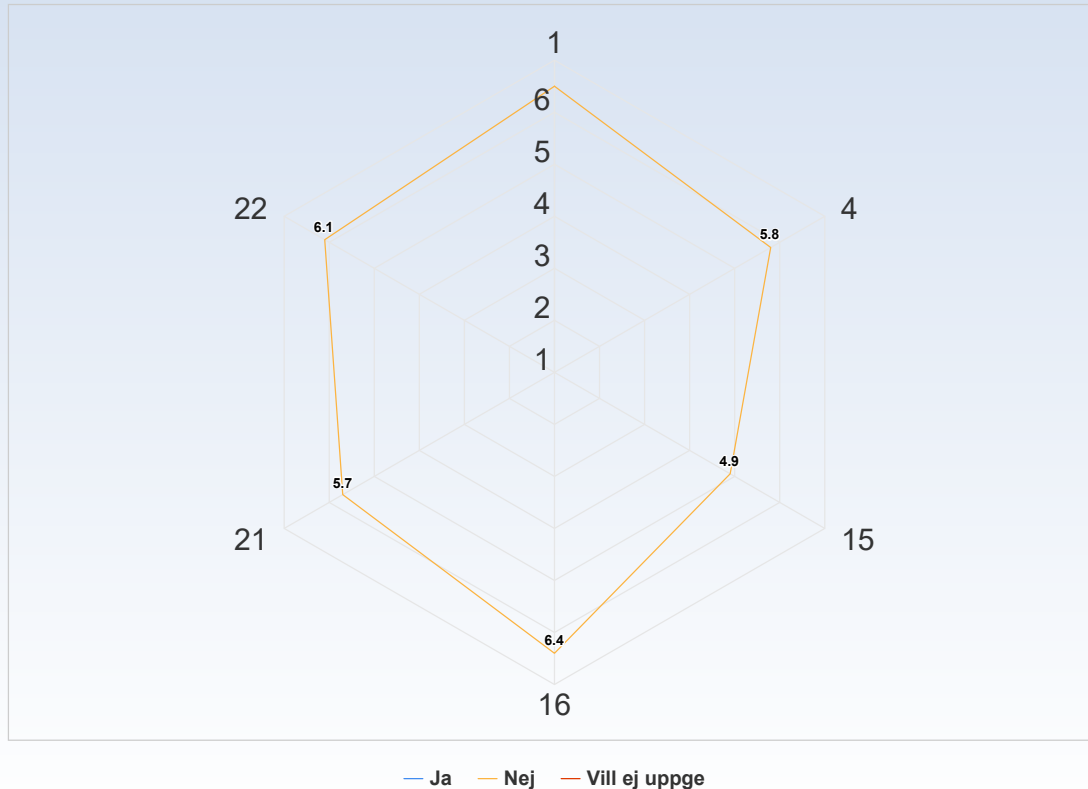
Comments (I am: Internationell masterstudent)

This is probably the most well-designed , balanced course I have taken at KTH. Nothing felt rushed, I felt I received enough information as required. Really interesting to also meet so many interesting people!

Comments (I am: Internationell utbytesstudent)

For exchange student it is easy to pass but the course is interesting only if you invest too much time and this is not the goal of an exchange...

Average response to LEQ statements - per disability



## GENERAL QUESTIONS

What was the best aspect of the course?

What was the best aspect of the course? (I worked: 3-5 timmar/vecka)

The professor is pretty charming. Besides, playing music on the lecture is pretty exciting.

What was the best aspect of the course? (I worked: 6-8 timmar/vecka)

I like the open project, where we can explore the interesting topics.

Machine learning with music is a new topic to me.

What was the best aspect of the course? (I worked: 9-11 timmar/vecka)

The teachers were passionate and were very present for any questions.

Very entertaining lectures, especially the ones that we're live and not on Zoom. I like that the lectures are an introduction to subjects and that labs and the literature was used to actually use ideas and concepts that we're discussed.

What was the best aspect of the course? (I worked: 12-14 timmar/vecka)

Topics are really interesting, professors are very passionate and communicate their interest

Bob is an exceptional lecturer. Lectures were fun, and I still learned a lot from them.

To really try out the different areas in the practical labs and see the results of the algorithms was very rewarding. The lectures also gave a good overview of the material and was inspirational to attend.

Great lectures! A breath of fresh air compared to many other courses.

The topics are interesting, and the lessons are worth attending since the teachers are good at breaking down difficult concepts in a simple way. Hard to pick one best aspect since there are so many.

Probably the material since I have a big interest in music. I also really liked the lectures, though I have trouble paying attention on lectures over zoom...

What was the best aspect of the course? (I worked: 15-17 timmar/vecka)

Follows the chapter of a book

## What would you suggest to improve?

What would you suggest to improve? (I worked: 3-5 timmar/vecka)

I would recommend more connection with the music itself. It appears more like a signal processing course for me, as a student with engineering background.

What would you suggest to improve? (I worked: 6-8 timmar/vecka)

More examples should be given, because the labs were pretty difficult.

What would you suggest to improve? (I worked: 9-11 timmar/vecka)

Have all lectures live is my preference. Hard to follow on Zoom in general especially if the topic is advanced.

Would also prefer that some of the Python packages used were hard to install. I know others in the course weren't able to install the "madmom" package which was required for one lab. This required some c++ environment, so if there is an alternative which can be compatible with only Anaconda (which most students have), maybe use it instead.

Could be an idea to maybe switch over the MATLAB if there are similar packages there. But for computer science students, maybe this isn't a problem (I'm from mechanics).

This is not possible to read 60 pages of a very complicated book before every class. This is stressful because you cannot manage to do it.

What would you suggest to improve? (I worked: 12-14 timmar/vecka)

In contrast to Bob's, Andre's lectures were unfortunately not as good. I didn't understand why they were online. Furthermore, they were rather dull and boring. I didn't feel like Andre was doing a good job as a lecturer. I am not complaining about the content of Andre's lectures. But I got the feeling I get more out of them by just not attending his zoom meetings, but reading through the slides myself instead.

More theory in the assignments, and perhaps some proposals to base the projects on.

Would be nice to have an optional lab or some source codes for genre recognition.

I really liked the course as it is now.

Maybe include more up to date, more advanced topics and ways to solve them

What would you suggest to improve? (I worked: 15-17 timmar/vecka)

Explain the grading system of the course

## What advice would you like to give to future participants?

What advice would you like to give to future participants? (I worked: 3-5 timmar/vecka)

It is a good course that you can find something fun, while learning some new concept in music in a signal processing view. However, if you wanna learn something about generation, I would recommend you to find another course.

What advice would you like to give to future participants? (I worked: 6-8 timmar/vecka)

Start early with the labs.

Keep pace of the professors. This is not a difficult course. Be sure to start thinking about your project early.

What advice would you like to give to future participants? (I worked: 9-11 timmar/vecka)

If you want to like this course, you need to invest a lot of time and this is too much sometime. You need to be ready to do only music Informatics and not others classes.

Start the labs on time and go to all the lectures, they are fun!

What advice would you like to give to future participants? (I worked: 12-14 timmar/vecka)

Do the assignments on time.

Stay on top of the practical labs so that you can spend more time on the project, since it could be very rewarding!

Start working on the project quite early. It takes time to find a suitable data set and to work out all the quirks of your project.

Attend the lectures, they are very engaging.

Beware of the time for labs

What advice would you like to give to future participants? (I worked: 15-17 timmar/vecka)

The teammates are important

## Is there anything else you would like to add?

Is there anything else you would like to add? (I worked: 9-11 timmar/vecka)

Great course, thank you!

I had a lot of trouble understanding the prof because he has an accent I wasn't used to and he speak too fast for me. In that case I was almost not able to understand any of the classes and then it was too hard to follow correctly the course.

Is there anything else you would like to add? (I worked: 12-14 timmar/vecka)

The most enjoyable course I have taken at KTH (though my interest in music likely colours this assessment)

I think the course is quite open to students with different backgrounds and doesn't necessarily require any prior knowledge, which is really good.

I feel like this course was very well made and I'm glad that I took it!

## SPECIFIC QUESTIONS

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## RESPONSE DATA

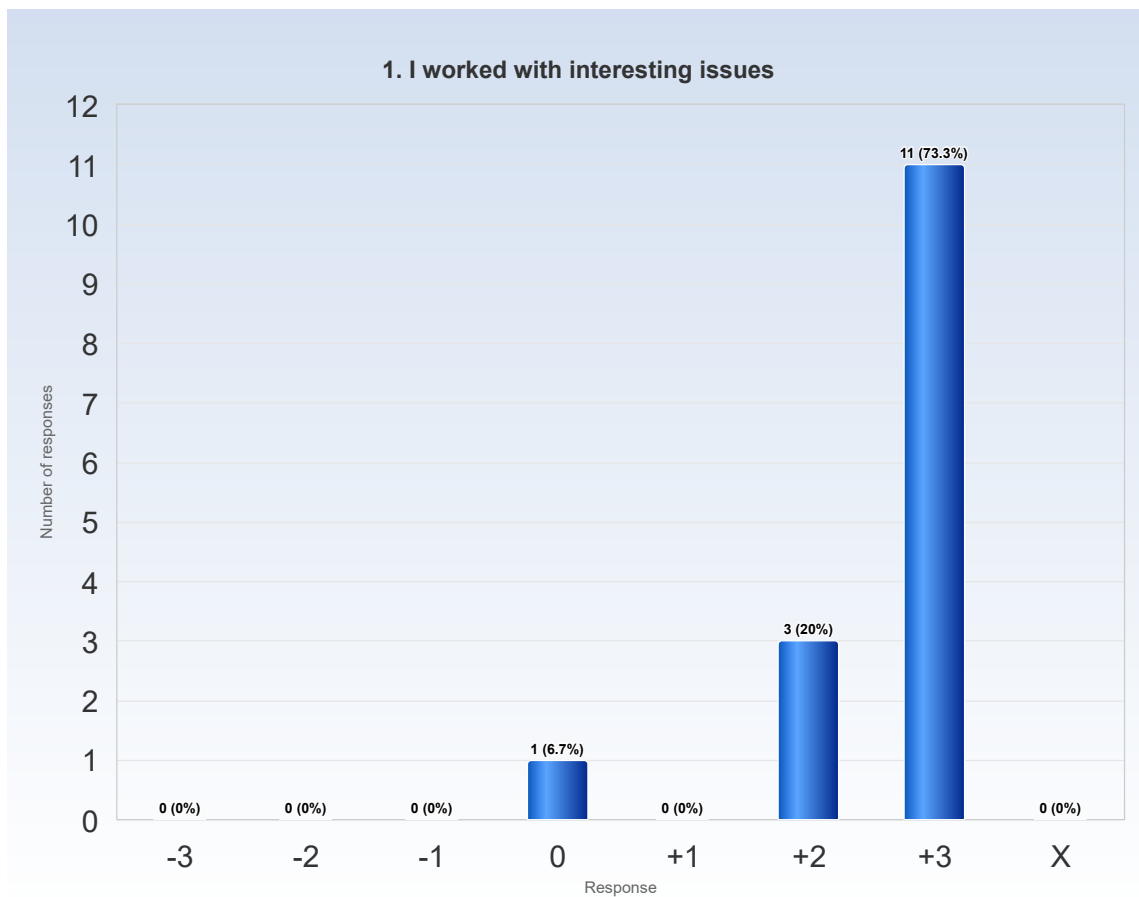
The diagrams below show the detailed response to the LEQ statements. The response scale is defined by:

-3 = No, I strongly disagree with the statement

0 = I am neutral to the statement

+3 = Yes, I strongly agree with the statement

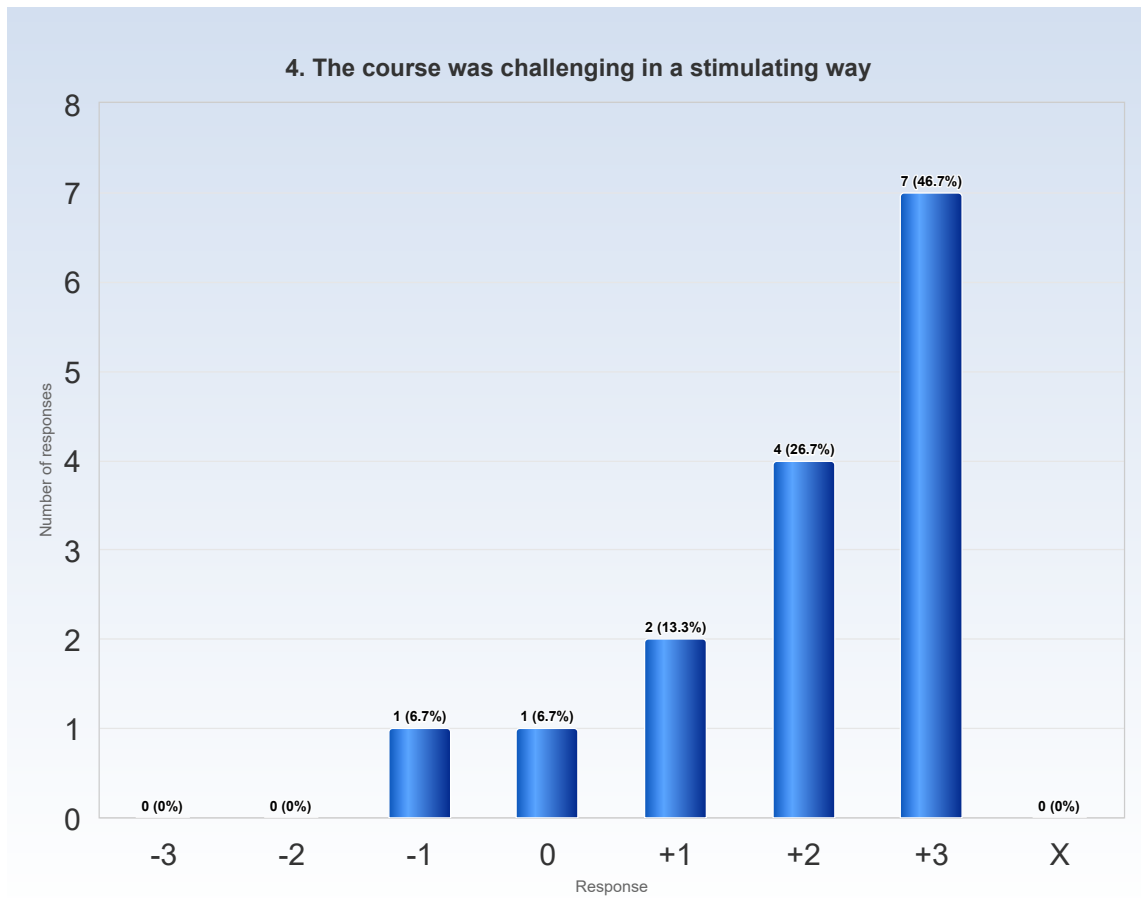
X = I decline to take a position on the statement



Comments

Comments (My response was: +3)  
really happy to learn how shazam works

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Comments

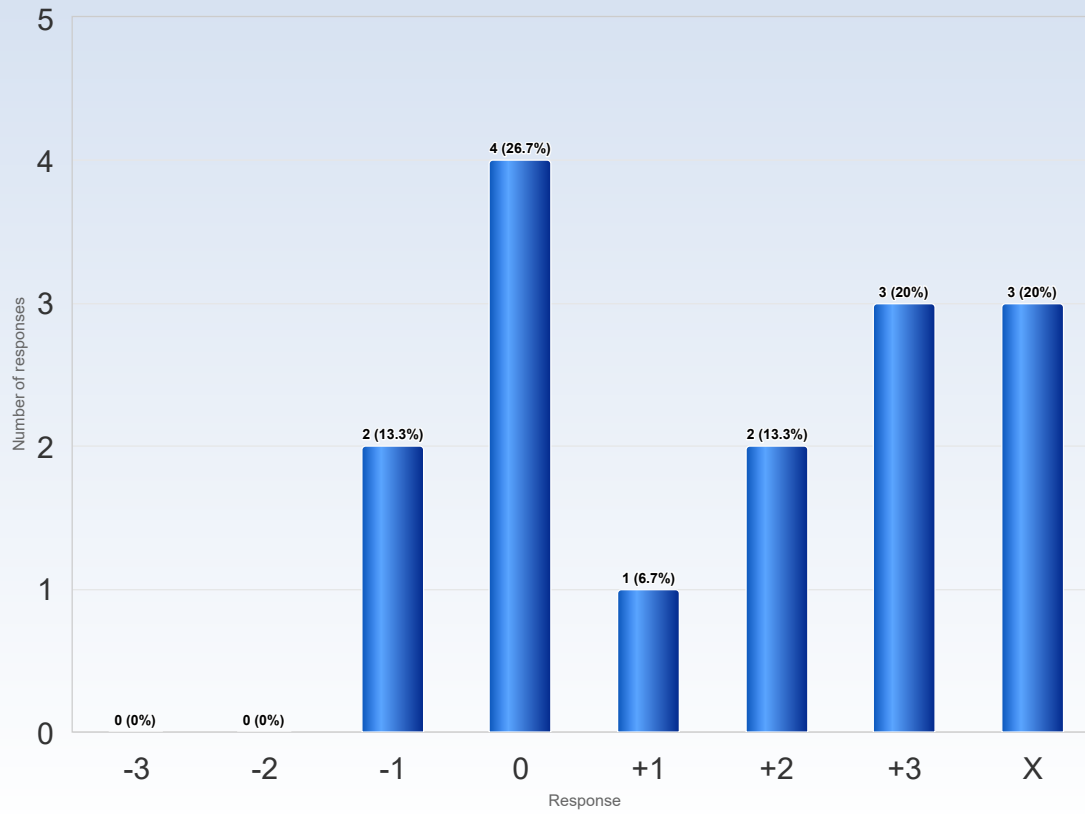
Comments (My response was: +1)  
wasn't that challenging, might due to the fact i'm from ML master

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Comments (My response was: +3)  
It was really great to see the results in the lab, and also connecting it to other working phenomenoms like Shazam for example!

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15. I was able to practice and receive feedback without being graded



Comments

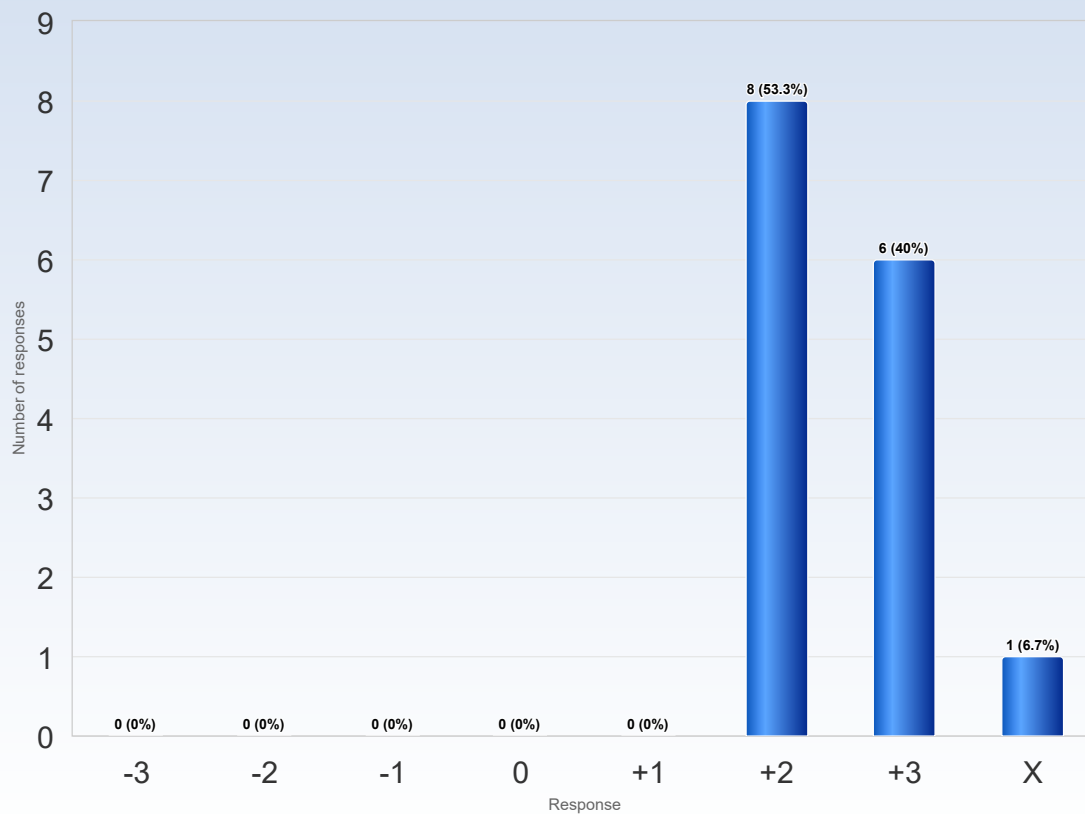
Comments (My response was: -1)

It is graded. Not a big deal

Comments (My response was: X )

Don't think this was possible?

### 16. The assessment on the course was fair and honest



#### Comments

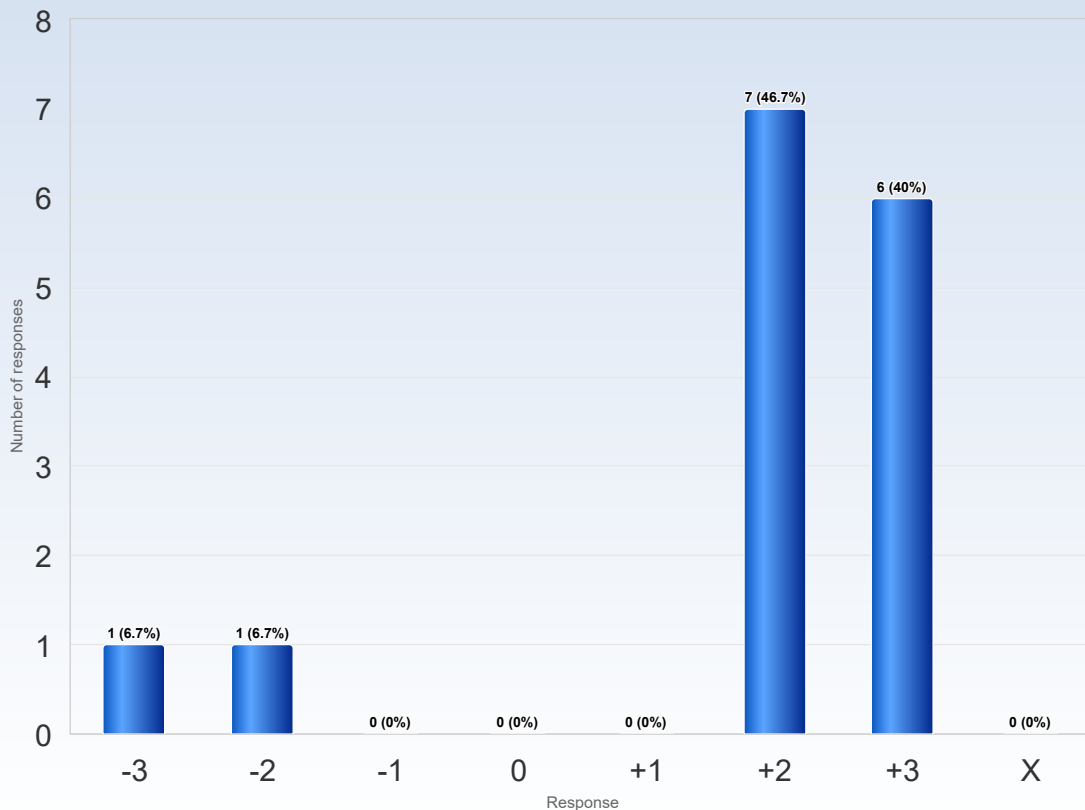
Comments (My response was: +2)

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Some of the comments made by TAs corresponding to grading made absolutely no sense.

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### 21. I was able to learn by collaborating and discussing with others



#### Comments

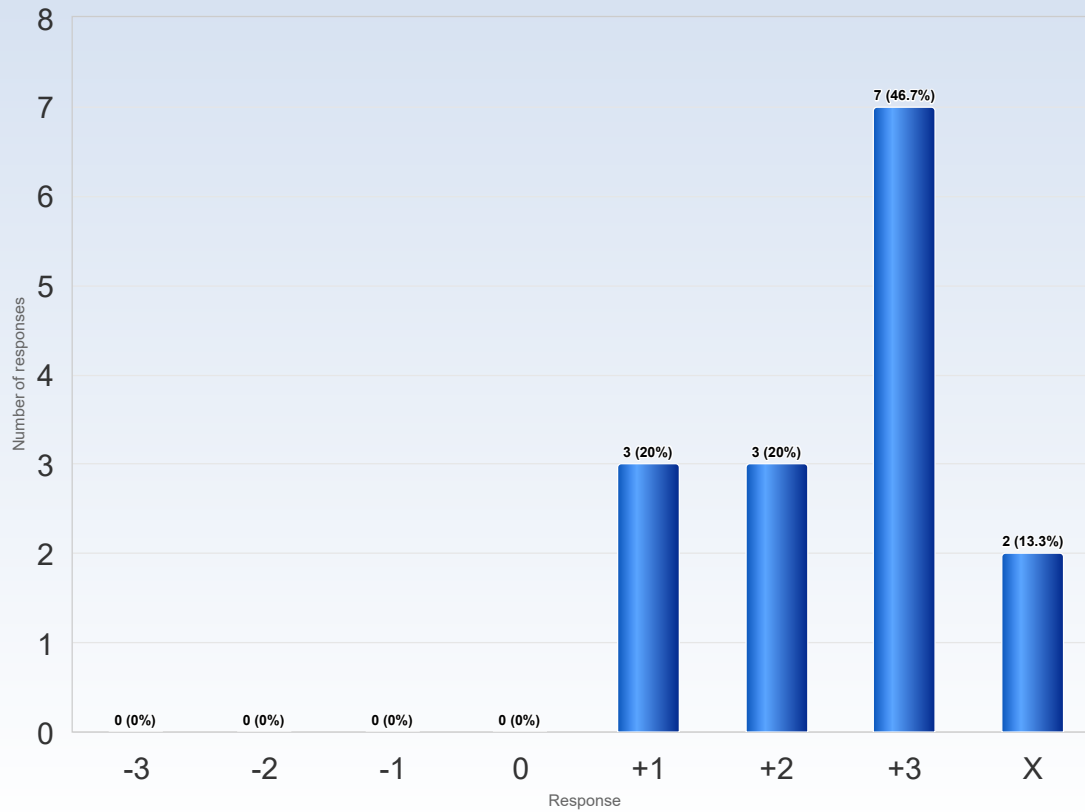
Comments (My response was: -3)

It is not the fault of course, but bad luck with teammates

Comments (My response was: +2)

With lab mate mostly, project also

## 22. I was able to get support if I needed it



### Comments

Comments (My response was: +3)

The response on canvas discussion was very good!

The teachers were passionate and patient in answering questions