

## Course analysis BB1070 Genetik (6.0 hp)

### Background

Notably, this is a relatively new course, started 2019. Similar courses in genetics have been given since 2008 under different names, and with varying hps. Most recently, it was given just once, HT 2018, as BB2475 with 7.5 hp. Before that it was given, since 2010, as a part of BB2470 with 4.5 hp. The present version of the course has 6 hp. The previous courses were given at master level in year 4, but the new course is given in year 3 at bachelor level.

Consequently, there has been considerable course development the last few years. Because the course has been expanded from 4.5 hp to 6.0 hp there has been an opportunity to expand the content of the course, which has allowed a broadening, most importantly including "epigenetics" and "small RNAs" in the curriculum.

Importantly, during this year's course, the COVID-19 pandemic came to Sweden. This did not affect the lectures, but at the exam a couple of students could not attend because of disease symptoms, and where therefore offered an oral exam. The major effect of the pandemic will be that during 2021 the course must be adjusted to remote teaching, which will imply considerable extra work. Therefore, no major changes to the curriculum are planned this year.

### **Number of registered students:**

61

### **Number of students writing the exam, at first (ordinary) exam.**

55

### **Exam Results:**

44 of 55 students (80%) passed the exam.

Number of students per grade: 15 A; 12 B; 8 C; 5 D; 4 E; 3 Fx; 8 F.

### **Summary of Course evaluations**

To be found below, directly after the Course analysis.

### Course analysis

The course analysis is based on a course evaluation given to the students at the exam. Out of the 55 students at the exam, 50 (91%) handed in the course analysis. Thus, the **reply rate was 91%**, which is very high for a statistical

survey, which should imply that the results reflect the students' opinion quite well.

## What was good with the course?

The results on the exam were generally very good. 80% of the students passed the exam at first attempt, and the grades were high. For example, 27/55 (49%) of the students got grade A or B.

The students generally rate the overall quality of the course very highly, according to the Course evaluation handed out to the students. On the question "**How was the overall quality of the course?**" with the alternatives "Very good/Good/Acceptable/Not good/Bad", the students answered with the following frequencies: **22/24/4/0/0**.

Thus, 22 of the 50 students answering the course evaluation, **44%**, answered "**Very good**", implying that 44% of the students seem in principle totally satisfied with the quality of the course!

Four students (8%) did not rate the course as "Very good" or "Good", instead rating it as "Acceptable".

On a scale 1-5, setting "Bad" to 1 and "Very good" to 5, the **mean rating is 4.36**. The high **reply rate, 91%**, implies that the answers should reflect the students' opinion quite well!

Thus, I conclude that the students are generally pleased with the course. It is notable that many students think that this course has a relatively heavy workload, but still think it is good!

In addition to my own questions, the course evaluation also included questions from the KTH Learning Experience Questionnaire (LEQ). Also the LEQ indicated a generally very successful course and satisfied students.

The scale for answers is 1-7 (1 = No, I strongly disagree; 4 = I neither agree nor disagree; 7 = Yes, I strongly agree).

For the three questions I think are the most important parameters, the answers from the students were very reassuring:

Question: "**The atmosphere in the course was open and inclusive**": Mean value **6.54**

Question: "**I understood how the course was organized and what I was expected to do**": Mean value **6.64**

Question: "**The course activities helped me to reach the learning objectives efficiently**": Mean value **5.89**

Thus, quite high values for these questions.

I am especially happy that the question "**The atmosphere in the course was open and inclusive**" got the high **mean value 6.54**. It is a major goal for me that the students feel well treated and have a good time in the course, since I think this is a very effective tool for the learning. I also think that it is important for any leader of a group of people to make sure that the group members are comfortable and feel well treated. The high score on this question indicates that I have created a good learning climate.

Furthermore, based on the high values on the two other questions: "**I understood how the course was organized and what I was expected to do**": mean value **6.64**, and "**The course activities helped me to reach the learning objectives efficiently**" mean value **5.89**, I draw the conclusion that my pedagogics, my deep learning design and my alignment of course activities and exam seems to work well!

Also the fact that the question "**I could get support if I needed it**" got a relatively high value, **6.33**, is gratifying. I actively try to make sure the students get the help and support they need: I make sure to be available both before and after lectures for questions, and the students are encouraged to send emails with questions about things they need explained. These questions are then discussed at the next lecture, so that the lectures have a function as query sessions. I am therefore happy to see that the students seem to be pleased with the amount of support they get from me and from other students.

To summarize, according to all available statistics (Grades given on the exam, my own course evaluation and the KTH LEQ), the students have generally reached the "intended learning outcomes", and are also generally very satisfied with the course.

A positive aspect is that, since the course has been expanded from 4.5 to 6.0 hp, I have been able to expand the curriculum of the course. Most importantly, I have included epigenetics, which was not covered before. This subject has only limited coverage in the other bachelor courses, which makes it important to give a comprehensive coverage of this subject in this course. From the communication with the students it is clear that the knowledge of epigenetics is vague for many students, showing that the teaching of epigenetics in this course is a valuable improvement of the Biotechnology programs.

## **What was bad with the course?**

A major issue, according to the LEQ, is that many students say that they had started their self-studies a bit too late, in spite of knowing about the advice from previous students to start early with the self-studies (and now regretting not following the advice). However, it is a less common comment than last year. Furthermore, in their estimation of study effort the mean estimated time spent on the course is 146 hours, while the course is 6.0 hp and thus 160 hours.

However, the study hours have increased from 135 hours last year. Therefore, the estimated study time is lower than the stipulated hours, but significantly higher than last year. Therefore, there may still be a problem that some students start their studies too late and/or spend too little time on the course. I have tried to inform the students very clearly that they need to spend the stipulated hours and study along the whole course. It seems that this may have led to improvement, but I still need to work on this communication, to motivate the students to head start their studies.

On the other hand, the students that passed the exam had generally very high grades, so it seems that students that do put in enough time also learn what they should. Thus, I suspect that most students put enough time on their studies, and that the problem concerns a minority of the students.

The other major problem was that, like the previous years, the students had relatively bad results on the exam on the questions about epigenetics and small RNAs. The result was clearly better this year than the year before, but still not satisfactory. This may reflect that the the course material is not optimally pedagogical. Since this is an emerging field it is not well covered in most course books, and I have not found any really good texts. Last year I added an additional text which I think explains things a bit better, which may explain that the results improved. I will therefore keep looking for better texts and also try to improve my lecture on the subject, to explain this subject in more detail to the students.

The course book is a slight problem. It is quite old (from 2006) for this quickly evolving field. However, it's pedagogics is unique and perfect for my teaching so it is hard to replace. I keep the book and complement with additional texts for now.

### **What changes will be made until next time the course is given?**

Because of the COVID-19 pandemic, the course has to be adjusted to remote teaching, which will imply a lot of extra work. Therefore, except for the adjustments to the pandemic situation, no major changes will be made to the course this year.

However, the students had relatively bad results on the exam on the questions about epigenetics and small RNAs, though a bit better than last year. Since these fields have developed significantly the last few years, I cover them by using two chapters from a recent course book, "Essentials of Genetics" 9th ed by Klug *et al.* These texts are actually not very well written, and last year I added an additional text for better explanations, which may explain the somewhat better results. Still, it is obvious that the students struggle with this subject, and I will therefore make efforts to explain this in more detail at the lectures, and keep looking for better texts.

The Additional texts are supposed to cover the latest scientific progress, and a couple of the texts are normally changed each year, and probably so also next year.

***Here follows the Course evaluation questionnaire given to the students, with results and my comments written in red:***

## Course evaluation BB1070

The goal of this evaluation is to get information from you students, to enable improvements of contents and concept of the course. It is important help for me!

It is OK to skip questions if you can't/don't want to answer!

If more space is needed, please use the backside.

### ***My comments:***

*50 students of the 55 doing the exam answered => **Frequency of reply = 91%**,*

*This is a very high answer frequency for a statistical survey, which should imply that the results reflect the students' opinion quite well!*

1. How was the overall quality of the course?

Very good	Good	Acceptable	Not good	Bad
<input type="checkbox"/> 22	<input type="checkbox"/> 24	<input type="checkbox"/> 4	<input type="checkbox"/> 0	<input type="checkbox"/> 0

### ***My comments:***

***Mean value (on scale 5 – 1) is 4.36.***

*The trend for the previous courses (BB2470 and BB2475) from 2010 to 2020: 4.21; 4.30; 4.32; 4.55; 4.23; 4.60; 4.32; 4.39; 4.16; 4.21; 4.36*

*Thus, students are overall very satisfied each year.*

*Notably, 22 of 50 students, **44%**, answered "**Very good**", implying that 44% of the students seem in principle totally satisfied with the quality of the course!*

Comments:

***My comment: Exempel på positiva kommentarer:***

"Den bästa kurs jag gått och den mest/bäst strukturerade inom CBTH skolan. Bra upplägg, vägledning och utförande"

"Very easy to take part of the material and good lectures, du var tydlig!"

2. How was the course book?

Very good	Good	Acceptable	Not good	Bad
<input type="checkbox"/>				

Comments:

***My comments:***

***Mean value (on scale 5 – 1) is 3.74.***

*This is a very special book which is the core for my course, so I am happy the students find it OK, with it's good and bad sides.*

***My comment: A few typical comments:***

"Bra, förståelig och obligatorisk"

"Think it was messy sometimes and seemed very old"

"Ibland förvirrande, ibland för kortfattad/oförklarande"

3. "The additional texts"

(a) What did you think about the "additional texts"? Did it give you something extra, compared to just reading the course book? Was the amount of reading OK?

(b) What do you think about the method of examination of the texts? My goal is that you should be able to read "relaxed" by not having to study details. And enjoy the texts and become wiser human beings... Did this work? And were the discussions interesting? Or, would you have wanted another form of examination?

Comments:

***My comment: A few typical comments:***

"Väldigt bra men vissa artiklar svåra att förstå. Diskussion kul och nyttigt"

"Väldigt avslappnat och roligt! Kändes inte "läskigt" utan man fick säga det man ville och det gav mycket att läsa texter och artiklar som jag kanske inte läst annars"

"Helt OK mängd och SÅ intressanta texter. Tycker det gav mig jättemycket så stort tack!"

**4. Lectures and study questions**

(a) The course has relatively few lectures, which do not cover everything in the course. How did this work? Would you have liked to have more lectures?

(b) On the other hand you had the study questions intended to partially replace lectures, did this work? What did you think about the study questions?

Comments:

***My comment: A few typical comments:***

"Det funkade bra men kunde ha varit kul med fler föreläsningar"

"Det var bra att ha övningsuppgifterna, då höll man sig i fas!"

Please see also the **KTH Learning Experience Questionnaire (LEQ)** on next pages!

**Thanks a lot for the help!**

## Course evaluation (LEQ) for BB2470 part 1, fall 2016

### KTH Learning Experience Questionnaire (LEQ)

LEQ is a tool that examines your experience of the learning environment in a course. It consists of a number of statements and a few open questions. Please indicate to what extent you agree or disagree with a specific statement on a scale between 1 and 7, where

**1** = No, I strongly **disagree**

**4** = I **neither** agree nor disagree

**7** = Yes, I strongly **agree**

X = I'm unable to respond *or* I consider question irrelevant to the course

***My comment: I have inserted the mean value of the answers from the students for each question, my conclusions about these results, and some comments from the students.***

### Estimated effort

On average, how many hours/week have you been working with the course (including scheduled hours)?

0-7h	8-12h	13-17h	18-22h	23-27h	28-32h	33h or more
<input type="checkbox"/>						

**Mean value 16.25h**

### Learning experience

1. I worked with interesting issues	1	2	3	4	5	6	7	X
	<input type="checkbox"/>							

Comments: **Mean value 6.38**

2. The atmosphere in the course was open and inclusive	1	2	3	4	5	6	7	X
	<input type="checkbox"/>							

Comments: **Mean value 6.54**

3. I understood how the course was organized and what I was expected to do
- |                          |                          |                          |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1                        | 2                        | 3                        | 4                        | 5                        | 6                        | 7                        | X                        |
| <input type="checkbox"/> |
- Comments: **Mean value 6.64**
4. I understood what the teachers were talking about
- |                          |                          |                          |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1                        | 2                        | 3                        | 4                        | 5                        | 6                        | 7                        | X                        |
| <input type="checkbox"/> |
- Comments: **Mean value 6.37**
5. I could learn from concrete examples that I was able to relate to
- |                          |                          |                          |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1                        | 2                        | 3                        | 4                        | 5                        | 6                        | 7                        | X                        |
| <input type="checkbox"/> |
- Comments: **Mean value 6.48**
6. Understanding of key concepts was given high priority
- |                          |                          |                          |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1                        | 2                        | 3                        | 4                        | 5                        | 6                        | 7                        | X                        |
| <input type="checkbox"/> |
- Comments: **Mean value 6.28**
7. The course activities helped me to reach the learning objectives efficiently
- |                          |                          |                          |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1                        | 2                        | 3                        | 4                        | 5                        | 6                        | 7                        | X                        |
| <input type="checkbox"/> |
- Comments: **Mean value 5.89**
8. I could learn in a way that suited me
- |                          |                          |                          |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1                        | 2                        | 3                        | 4                        | 5                        | 6                        | 7                        | X                        |
| <input type="checkbox"/> |
- Comments: **Mean value 5.93**
9. I could learn by collaborating and discussing with others
- |                          |                          |                          |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1                        | 2                        | 3                        | 4                        | 5                        | 6                        | 7                        | X                        |
| <input type="checkbox"/> |
- Comments: **Mean value 5.96**
10. I could get support if I needed it
- |                          |                          |                          |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1                        | 2                        | 3                        | 4                        | 5                        | 6                        | 7                        | X                        |
| <input type="checkbox"/> |
- Comments: **Mean value 6.33**

***My comments:***

*The overall results show that students are quite happy with the atmosphere and design of the course.*

*The values have generally increased by around 0.15 compared to last year, and by 0.35 two years ago. Thus, it seems there is a positive trend, which may reflect my adjustments of the course.*

11. What was the best aspect(s) of the course?

***My comment: A few comments:***

"Riktigt intressant överlag! Kul att du Peter verkligen är så engagerande och seminarietexterna var ett stort plus"

"It was so fun and well organized! Great topics and a really nice teacher!"

12. What would you suggest to improve?

***My comment: A few comments:***

"En annan bok och fler föreläsningar"

"Maybe have example answers for the old exams"

13. What advice would you like to give to future course participants?

***My comment: A few comments:***

"Follow the schedule for the study questions and discuss them together!"

"Do the study questions on time!"

14. Is there anything else you would like to add?

*Thank you for taking the time to fill out this course evaluation!*