

Course analysis BB1070 Genetik (6.0 hp)

Background

Notably, this is a new course. 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.

Number of registered students:

53

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

46

Exam Results:

35 of 46 students (76%) passed the exam.

Number of students per grade: 5 A; 7 B; 9 C; 8 D; 6 E; 0 Fx; 11 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 46 students at the exam, 42 (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 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: **13/26/2/1/0**.

Thus, 13 of 42 the students answering the course evaluation, **31%**, answered "**Very good**", implying that 31% of the students seem in principle totally satisfied with the quality of the course!

Three students (7%) did not rate the course as "Very good" or "Good", instead rating it as "Acceptable" (two students) or "Bad" (one student).

On a scale 1-5, setting "Bad" to 1 and "Very good" to 5, the **mean rating is 4.2**. 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 **6.3**

Question: "**I understood how the course was organized and what I was expected to do**": Mean value **6.6**

Question: "**The course activities helped me to reach the learning objectives efficiently**": Mean value **5.6**

Thus, quite high values for these question.

I am especially happy that the question "**The atmosphere in the course was open and inclusive**" got the high **mean value 6.3**. 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. And I also think this is generally important for any leader of a group of people: 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 **6.6**, and "**The course activities helped me to reach the learning objectives efficiently**" Mean value **5.6**, 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, **6.2**, 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 will be 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). Furthermore, in their estimation of study effort the mean estimated time spent on the course is 120 hours, while the course is 6.0 hp and thus 160 hours. It is notable that 11 of the students claim they studied only around 80 hours, and that 11 students failed the exam (while it is of course not clear whether these are the same 11 students in both cases). So, I will have to continue struggling with motivating the students to head start their studies.

On the other hand, the students that did pass the exam had generally high grades, so it seems that students that do put in enough time also learn what they should. Furthermore, if the 11 students studying only 80 hours are ignored, the rest of the students study on average 140 hours, and thus almost according to the number of hps. Thus, I suspect that most students put enough time on their studies, and that the problem concerns a minority of the students.

Importantly, the course book was not available at Kårbokhandeln at the start of the course, so some students obtained it two weeks after start of the course. Therefore, things might improve if all students get the course book in time, and I will therefore make sure to communicate closely with Kårbokhandeln to make sure the course book is available at course start.

The other major problem was that the students had relatively bad results on the exam on the questions about epigenetics and small RNAs. This may reflect that the students had limited previous knowledge about these subjects, and that I failed to adjust accordingly in my teaching. It is also possible that the course material is not optimally pedagogical. I will therefore search for other texts explaining these subjects.

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

Since this was the first year the course was given, and since it is based on previous courses which changed in size from 4.5 hp (2017) to 7.5 hp (2018) and now finally to 6.0 hp, the course is under intensive course development. Most importantly, "epigenetics" and "small RNAs" has been introduced in the curriculum, and the literature seminar has been expanded, compared to the 4.5 hp format. Since the course was now changed from 7.5 to 6.0 hp, some parts are marginally decreased, but no parts will be totally excluded.

Notably, the new course is now in year 3 instead of year 4, but this will not affect the teaching considerably, since the students have approximately equal background knowledge and maturity in year 3 and 4.

Another aspect is that a larger part (practically all) of the Biotechnology students each year attend the course. Possibly this means that a larger proportion of students are not deeply interested in "genetics" compared to previous years. This might in turn mean that some pedagogic measures should be taken to get these students engaged in their studies. However, I did not experience any large difference in interest from the students, and the rating of "**How was the overall quality of the course?**" from the students (4.2) was only slightly lower than the average in previous years (4.4).

The course has five corner stones:

1. The course book "Fundamental genetics" by John Ringo (actually only 200 of the 400 pages) which is the primary source of knowledge for the students, and upon which the exam is based.
2. Approximately 300 "study questions" covering the studied parts of the course book, to indicate what the students should learn. The exam is then based on these 300 questions, implying that the students have a good knowledge of the intended learning outcome.

3. Additional texts (at the moment 12) of mostly popular science and editorial texts from Nature/Science broadening the scope of the course.
4. Seminars for scientific discussions about the additional texts, serving both to deepen understanding of the texts and as examination.
5. I encourage the students to email any questions they have, so that I can clarify or explain next lecture. In this way, the lectures have a function as query sessions.

This has been a very successful architecture for the course. It has been generally very popular with the students, and many students have especially praised the organization and that the intended learning outcomes are clear to the students. Therefore, I will keep this basic structure of the course, but details are constantly tuned from year to year.

However, the expansion of the course from 4.5 hp to 6.0 hp has enabled a major change: inclusion of “epigenetics” and “small RNAs” in the curriculum. 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.* Importantly, at the exam, the students had lower points on the questions about these subjects than on the other parts of the course. This may reflect that the students had very low basic knowledge about the subjects, and that I failed to adjust accordingly in my teaching. Therefore, I will this year make sure to establish the prior knowledge of the students in order to optimize the teaching about epigenetics and small RNAs. I will also search for other texts explaining these subjects in a more pedagogical way.

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.

In summary, the basic structure of the course seems successful, since students are generally satisfied and seem to reach the intended learning outcomes. Therefore, the basic structure will remain. However, the course has been expanded from 4.5 to 6.0 hp, and therefore details in the curriculum remain to be finetuned. I will specifically try to improve the teaching about epigenetics and small RNAs, since the results on the exam was relatively bad for these parts. Furthermore, the course is generally under constant development, especially concerning choice of additional texts for the seminars, and therefore changes are done yearly.

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

Course evaluation BB2475

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:

*42 of 462 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"/> 13	<input type="checkbox"/> 26	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0

My comments:

Mean value (on scale 5 – 1) is 4.21.

The trend for the previous courses (BB2470 and BB2475) from 2010 to 2018: 4.21; 4.30; 4.32; 4.55; 4.23; 4.60; 4.32; 4.39, 4.16.

Thus, students are overall very satisfied each year, but this year was a little below average.

*Notably, 13 of 42 students, **31%**, answered "**Very good**", implying that 31% of the students seem in principle totally satisfied with the quality of the course!*

Comments:

My comment: A few typical comments:

"Great course"

"Föreläsningarna var givande och intressanta, kul med forskningen om hundarna"

"Well explained theory with relevant examples and engaging lectures"

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 4.0.

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

My comment: A few typical comments:

"Lättläst men rörig, lite för "grund" ibland för att ge förståelse"

"Lagom kortfattad i de flesta fall. För kortfattad i vissa fall"

"Det är synd att den är så gammal (2004) men den "fundamentala genetiken" har säkert inte förändrats, ändå så har man detta i bakhuvudet när man läser den"

"Lite för gammal. Mycket har uppdaterats sen 2004"

"Bra koncentrerad information"

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:

"a) Ja det ger något extra och det var lagom mycket att läsa. Kul att få en inblick i dagens forskning. b) Tycker det fungerade bra!"

"Very interesting examination method. It made learning interesting and the texts were fascinating"

"I think that the extra texts focused on interesting subjects and that the literary seminars as a way of examining is lovely. One can really express oneself freely and really take ideas to the test"

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:

"a) Jag skulle ha föredragit fler föreläsningar där majoriteten av innehållet tas upp. Tentamen baseras då på föreläsningar, likaså instuderingsfrågorna. Boken är ett komplement. b) Ja det fungerade. Svårt att veta hur utförligt man skulle svara"

"a) För mig fungerade det bra. b) Mycket bra med studiefrågor!"

"Not more lectures, but they were good and fun. The study questions were great!"

"Frågorna kanske var lite för detaljerade ibland. Mycket specifika fakta"

"De va superbra! Vad jag skulle önskat va en till frågestund lite längre in i tentaP, då man faktiskt hunnit "djupdyka" i boken"

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

If possible, please clarify your opinion with a sincere and considerate comment; the questionnaire is fully anonymous.

Your feedback is very important for the continued development of this course – thank you!

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 15.0h

Learning experience

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

Comments: **Mean value 6.4**

2. The atmosphere in the course was open and inclusive

1	2	3	4	5	6	7	X
<input type="checkbox"/>							

Comments: **Mean value 6.3**

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 6.6**

4. I understood what the teachers were talking about

1	2	3	4	5	6	7	X
<input type="checkbox"/>							

Comments: **Mean value 6.2**

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 6.1**

6. Understanding of key concepts was given high priority

1	2	3	4	5	6	7	X
<input type="checkbox"/>							

Comments: **Mean value 6.0**

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 5.6**

8. I could learn in a way that suited me

1	2	3	4	5	6	7	X
<input type="checkbox"/>							

Comments: **Mean value 5.9**

9. I could learn by collaborating and discussing with others

1	2	3	4	5	6	7	X
<input type="checkbox"/>							

Comments: **Mean value 6.0**

10. I could get support if I needed it

1	2	3	4	5	6	7	X
<input type="checkbox"/>							

Comments: **Mean value 6.2**

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 0.2 compared to year (for BB2475).

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

My comment: A few typical comments:

"Very interesting topic and good course structure"

"I liked the structure of the course, it felt thought through and the learning progressed naturally"

"The seminars"

"Det välplanerade upplägget för undervisning och studier. + Roligt när lärare går igenom relaterade saker från egen forskning eller aktuella/historiska intressanta fenomen ej direkt kopplade till examination"

12. What would you suggest to improve?

My comment: A few typical comments:

"The study questions were a bit tricky to understand at times"

"I would perhaps make it more clear what "detailed" and "briefly" meant in the study questions. Difficult to know since the book itself is very brief"

"More lectures"

"Byt bok till nyare. Ibland vet man mer än boken men måste ändå skriva svar baserat på Ringo"

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

My comment: *A few typical comments:*

"Study doing the study questions early"

"Study together!!!"

"Start reading early"

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

"Great course"

"The speed of the course was not too fast and not too slow"

"Tack för en intressant kurs!"

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