

BIO210 Evaluation, Spring 2015

Course administrator: **Lawrence Kirkendall** (report author)

About the course

The 10 ECU course in evolutionary biology builds on basic knowledge acquired from introductory biology courses. Most students are third- year biology students, but both younger (2nd year) and older (MSc, PhD) students take the course. This is an elective course, but it is required for MSc students in the “BEØ” (Biodiversity, Evolution and Ecology) Masters degree program. The course is held in English, as there are always foreign students attending.). 31 students completed the course in 2015. The course meets twice a week for double-hour sessions (45 min instruction, 15 min break, 45 min instruction).

The goal of the course is to provide an understanding of how evolution works and basic knowledge of the main issues in evolutionary biology. The course provides an introduction to evolutionary biology, and covers population genetics and quantitative genetics, natural selection, adaptation, sexual selection, kin selection and social behavior, evolution and human health, life history evolution, speciation, molecular evolution, phylogenetic analysis, origin and history of life, evolution and development , and human evolution.

BIO210 is largely a lecture-based course, but each year I try to add more activities. Besides lectures, the 2015 course included:

- an orientation meeting before the start of lecturing; besides the basic information about the course, the meeting included a short lecture on learning theory and the importance of active learning* (17/18 students found this somewhat or very useful)
- three SimBio simulation modules*
- attendance at the Darwin Day/Horizont Lecture “*Evolution of Human Diversity*” by Marta Mirazon Lahr, followed by a question and answer session just for our class*
- Two double-hour discussion sessions with group work
- One double-hour panel discussion on speciation and species concepts (LK, EW, PHS)*
- One combination guest lecture and brief field trip (Nygårdsparken!) (LØ)*
- One joint discussion of phylogeny and speciation (LK, EW)*
- Two one-hour review sessions before the final exam, during which I used part of the time to simulate an oral exam*

* new in 2015.

In addition, this year I regularly used an interactive assessment application, Socrative (www.socrative.com), which allowed me to use prepared quizzes or spontaneous questions to gauge learning. Students respond to multiple choice or short answer questions using smart phones, tablets or laptops. I also frequently

posed questions to the class for immediate answers or for brief discussion with a neighbor.

The SimBio simulation modules were introduced in class but assigned as homework. Two of the three were discussed in class at some point.

The two final exam review sessions each included a simulation of an oral exam; this was new for 2015, and included because the vast majority of students had never had an oral exam before. Students were asked to prepare ahead of time one of the midterm exam multiple choice questions (that is, to understand the question and each of the answer alternatives). After an introduction about how the oral exam would be conducted, the students were paired: one acted as examiner on his/her prepared question first, then the roles were reversed. Each of the two rounds lasted about 7 minutes.

Faculty participants in 2015

Lawrence Kirkendall (All population genetics topics, most of the general chapters)

Endre Willassen (speciation and species concepts; phylogeny)

Andreas Hejnlol (molecular evolution; evolution and development)

Arne Skorping (life history evolution)

Lise Øvreås (history of life; microbial ecology and evolution)

Per Harald Salvesen (speciation in plants)

Course grading

Grading in the course is based on three simulation reports, a midterm and a final exam. The **midterm** covers the first 2/3 of the subjects (microevolution plus the general chapters on evolutionary processes). The midterm is mainly multiple choice but with a few short answer questions or fill-in-the-blank questions. The **final exam** is oral; questions are partly new, based on the final 1/3 of the course, and partly selected from the more difficult questions on the midterm. (Students know that they will get questions from the midterm, so they must learn from their mistakes!) Present at the oral exam were LK and Håvard Henriksen, the external examiner (*sensor*). The midterm and final are each 40% of the final grade, while 20% was based on grading of selected questions from the three simulation exercises. (Students seem to like this balance and the use of the oral exam: see the comments on the questionnaire.)

Required reading and simulation modules

The required reading was the international version of the 5th edition of *Evolutionary Analysis* (Jon Herron and Scott Freeman, 2015), all but chapter 2.

Three simulation modules from SimBio (www.simbio.com) were used: *Finches and Evolution*; *How the Guppy Got Its Spots*; *Flowers and Trees*. These are

interactive text chapters with virtual lab or field experiments and which include open-ended experiments.

In addition, I created a FaceBook group for the course. I used this to recommend articles and (especially) websites of particular interest, and some students also posted interesting finds. The group was also used to ask and answer course-related questions. All news items about the course were posted both to the FaceBook group and to the official My Space course website.

Following up on the 2014 course evaluation

In the 2014 course evaluation, I noted that students seemed to do more poorly than we had expected on the oral exam. In order to reduce insecurity about the format itself, as suggested in 2014, I introduced oral exam simulations in the pre-exam review sessions this year (described above).

In 2014, I asked “What did not work well?”, and “What could we do to improve the course?” I addressed several of those student concerns this year.

- “Difficult to know what level of detail to study, in the textbook.” “Hard to pick out what was important and what not, in the book chapters.” “Lectures don’t cover all of the topics in the chapters, so it would be nice to have better information on what to prioritize in studying.” (*several other comments like this*).
RESPONSE: this year I wrote brief “study guides” for most chapters, detailing the important concepts and vocabulary and telling which sections they could read quickly or skip altogether. The study guides were an innovation in 2015, and well received by the students (about ¾ found them useful).
- “Too little or unclear information about the virtual labs; hard to know what would be important for grading” (*many students said something like this*)
RESPONSE: I think this was much clearer this year.
- “Topics in the in-class discussions could be a bit difficult, which resulted in the discussions not working very well.” (*Several students made comments similar to this. Similarly, their were comments about questions raised by the lecturer during lectures not working very well, “blyge studenter”*)
RESPONSE: (Note: 2014 discussions were run by a different person than in 2015). Discussions worked better in 2015, and I was able to get a lot of different students to answer questions during lectures. I think the regular use of questions during lectures (with or without using Socratic) helped, as students gradually got used to them. I monitor the discussion session group work carefully, and I put a lot of thought into the questions used, and I think that these worked well for most students as a consequence (but see my comments on group discussions, below).

- “More use of Socratic”.
RESPONSE: Used it regularly in 2015.
- “Take the students out of the classroom more times, as with going to see Mikko’s experiments (*guppy research*)”
RESPONSE: No guppy visit this year (but will try to do so next time—Mikko Heino was on sabbatical during the 2015 course). But added a brief trip to Nygårdsparken with Lise Øvreås, where she demonstrated the presence of ancient Archaea in the muddy pond bottoms.
- Provide previous exams. (*This request comes up every year*)
RESPONSE: In each lecture, I gave the students 1 or 2 questions from a previous exam, usually as a Socratic question. I do not wish to provide entire exams, however.

Some points were not addressed, however:

- Exchanging names (*of students*), mingling. (*a good idea, should implement*)
- “Sometimes do survey among students about which part they are interested, and lecture more on that.” (*still thinking about this*)
- Better feedback on what was correct and what was wrong on the graded reports from the labs. (*not sure we have the resources for this, but will keep it in mind*)

2015 Evaluation by students

This year, I designed an electronic questionnaire for the first time, based in part on, and inspired by, that developed by Christian Jørgensen for BIO101, the introductory evolution and ecology course. The advantages of an online survey are the ease of analysis and obviating the need for transcribing hand-written responses into a final electronic document. The disadvantage is that it relies on students being willing to take the time to respond after the course is over and when they have already moved on to other activities. We did get replies from well over half of the students (18/31).

My comments on the questionnaire

Participation in the survey: 18/31 is a good response, but it may be biased towards those attending lectures regularly. For many lectures, later in the course, only 15 – 20 students came. Yet, only 1/6 respondents report having attended less than $\frac{3}{4}$ of the lecture sessions. Consequently, I suspect that we still don’t know much about the reasons some students skip many course meetings (in this or any other biology course).

Amount of time spent on the course: it surprised me that half of the students put in less time than expected for a 10 ECU course. At the same time, some complain that there is too much reading. I don’t know if this is typical or not. I am not sure what to think about this.

Student comments on the lectures: I spend a lot of time thinking through the presentation of each lecture, even though, for most, I don't have to change my powerpoint presentations much, and even though I do improvise a lot. This year, that included more time in than in previous years, due to extra time invested in developing in-class questions and short exercises. I am happy that students respond positively to my efforts.

Use of Socratic: Only about $\frac{1}{4}$ of the students thought this increased learning. This was my first year really using this regularly. I see how I can improve my usage, by giving better feedback to the students about their answers, and probably by incorporating "exit questions" (as suggested by one student) which have been shown to increase learning.

Amount of reading: very mixed responses, but on balance I will probably try to reduce it somewhat. (There are more comments about this in the end of the survey.)

Use of simulation modules: An overwhelming proportion of students felt the modules helped them learn, so I will continue and expand their use. The comments will be useful in improving how I use these in the future. As with lectures, I need to ensure that these modules also challenge the best students, without making them too difficult for those struggling with the course.

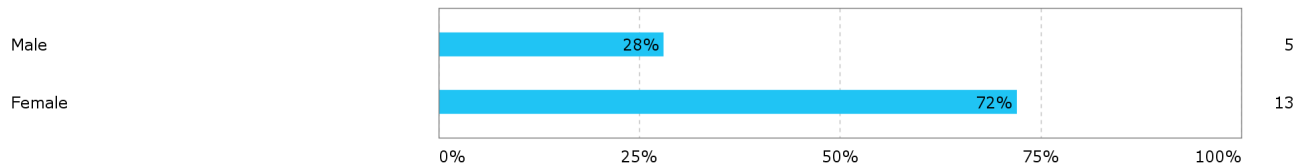
Simulation of oral exam: The response is not completely positive (1/3 found it less than "somewhat useful"), something to think about next time...

Flow of information about the course: 15–20% were unhappy about the course information. Generally, I don't know why, though one student commented that there were too many messages. I should survey students about this after the first few weeks of the course.

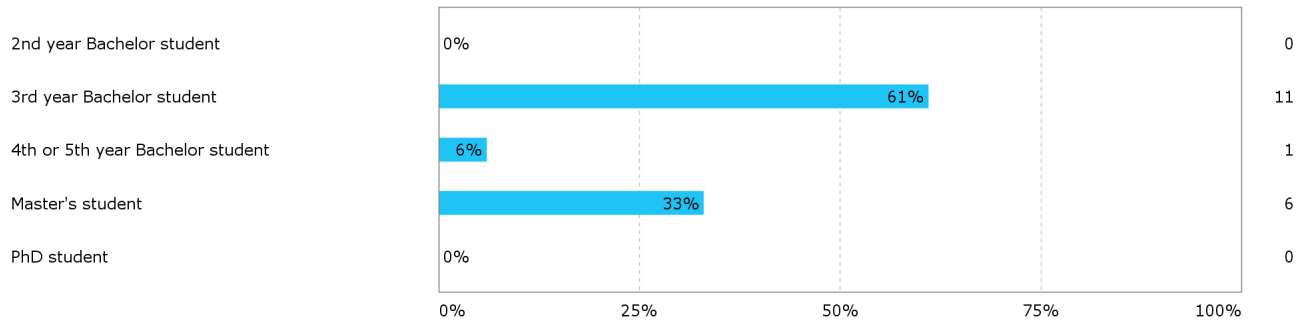
Group discussions: Two students specifically commented negatively on the group discussions. I agree with the student who wrote "...When other students were explaining the question they had and their answer, it was really difficult to learn about it because no time to really understand the question." This I can improve.

Report from student evaluation BIO210 spring 2015:

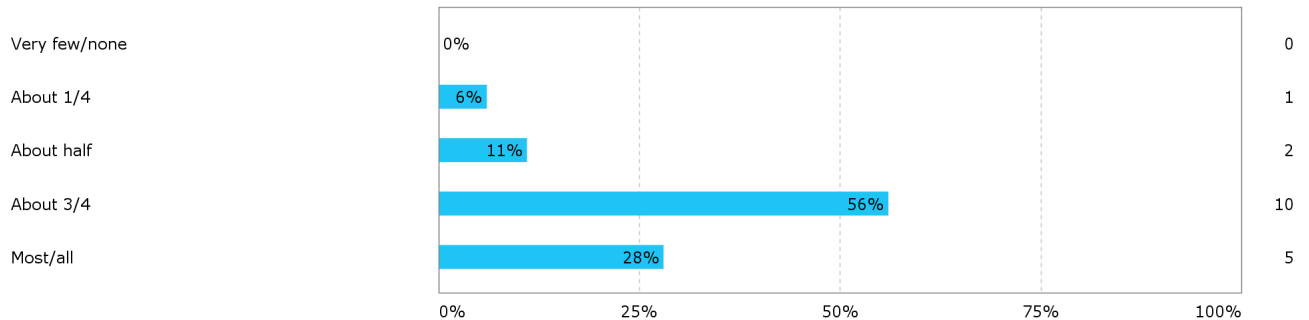
Gender



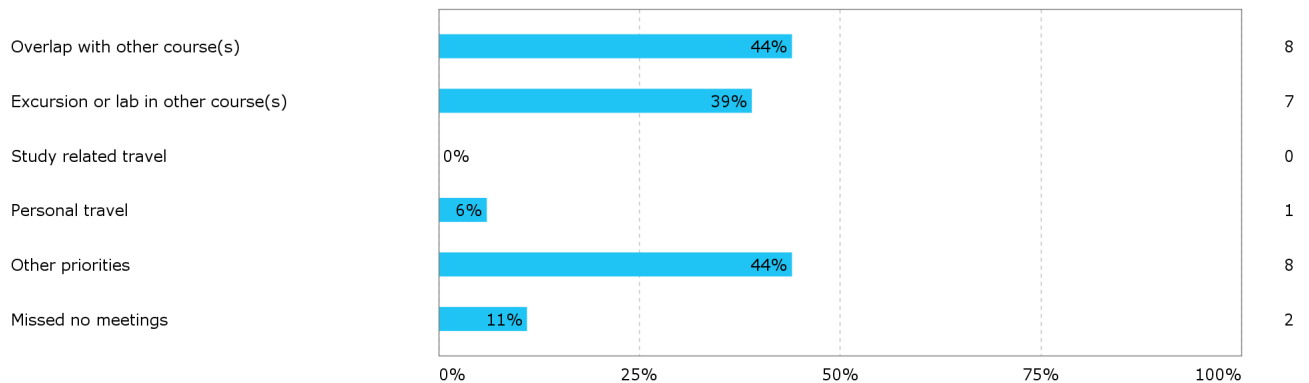
Background



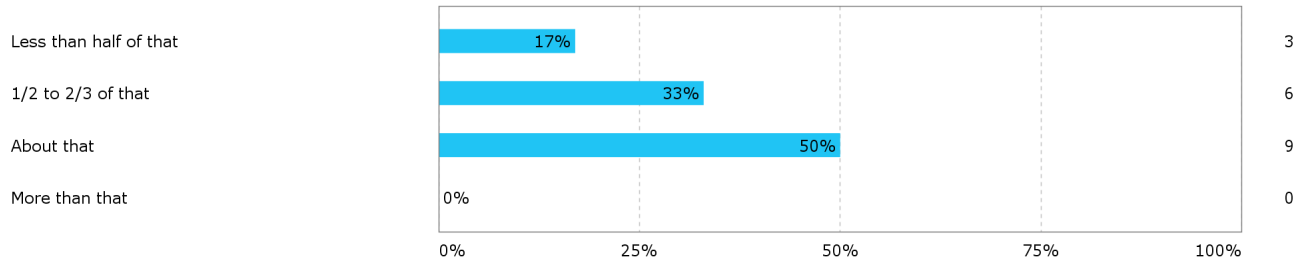
What proportion of the course meetings did you participate in?



What was the main reason you missed meetings? (You can chose more than one)



During the semester, up to the end of lectures, how much time did you put into this class? The expectation for a 10 ECU course is 11–13 hours per week.



Do you have any comments on the lecturers? - Lawrence Kirkendall

- Very clear in explaining all the topics, and takes a lot of time and effort for students (and individuals) to be sure we understand everything. Also the use of the BIO210 facebook group has proven to be very effective and fast + easy to communicate for last minute questions and answers.

Also your way of teaching is entertaining - meaning that you still get to explain the serious topics but always with humour, which makes it easy to pay attention to your lectures. This is very good.

I would say Mr. Kirkendall is an above the average lecturer.

- I really like that you use examples that are not from the book. Very good clarification of the chapters in the book, works for me like a summary.
- Good. It would be good to have answer from the graded questions or quizzes.

Study guides highly useful!

- very thoughtful teaching style, always a lot of fun to listen to him, because he is so fond of the topics, that it keeps me interested, too!
- You are the best!
- Good lectures. The presentations is good, with examples that is not in the book, but the powerpoint presentations can sometimes be a little "messy". Too much text in one slide.
- Excellent lecturer, very enthusiastic and interactive with the class
- Great course, Lawrence! It was very clear to me that you really enjoy the subject and went beyond what is required of you, which made your lectures very good :)
- Really good Lecturer!

Do you have any comments on the lecturers? - Arne Skorping

- Very Interesting topic. Good at introducing a topic that most of the students haven't hard of before.

Do you have any comments on the lecturers? - Lise Øvreås

- Good lecture!
- I really liked this lecture. It is a very interesting theme.

Do you have any comments on the lecturers? - Endre Willassen

- Very interesting lecturer

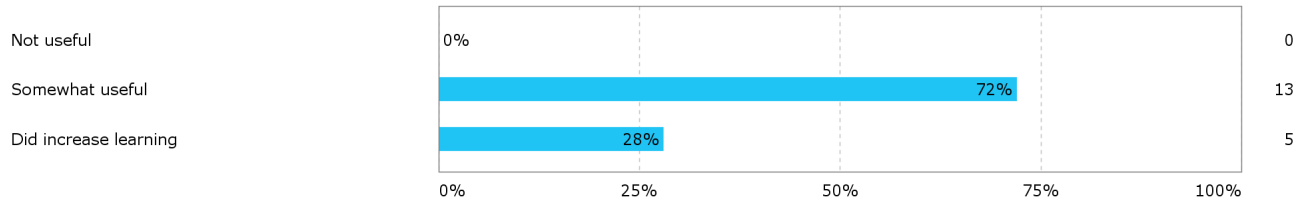
Do you have any comments on the lecturers? - Per Harald Salvesen

Do you have any comments on the lecturers? - Andreas Hejnol

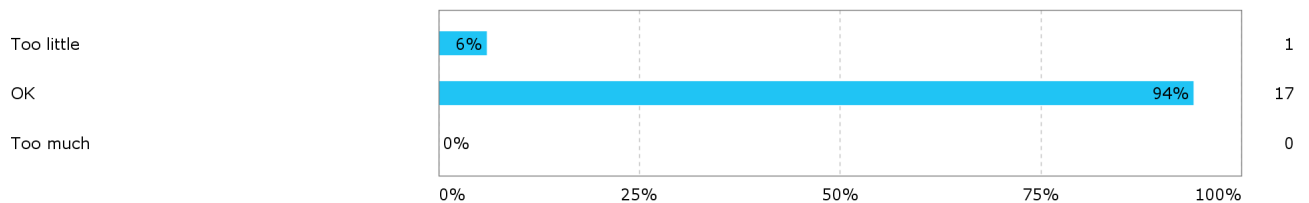
Do you have any comments on the lecturers? - Marta Mirazon Lahr

- Perfect. Thrilling, relevant to the course, and very informative about a topic I knew very little about.
- I could not participate because of work.

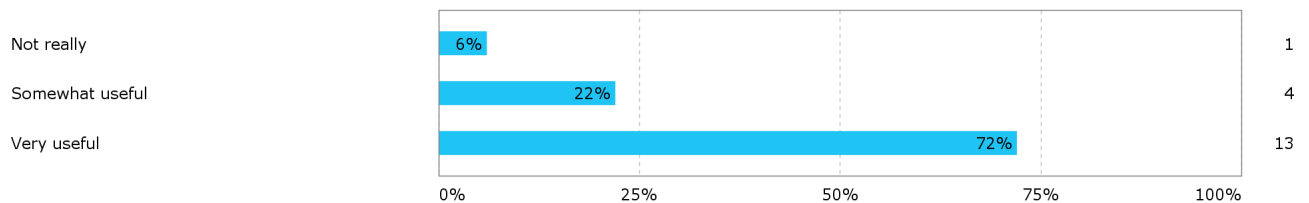
What do you think about the use of Socrative in class, for increasing learning?



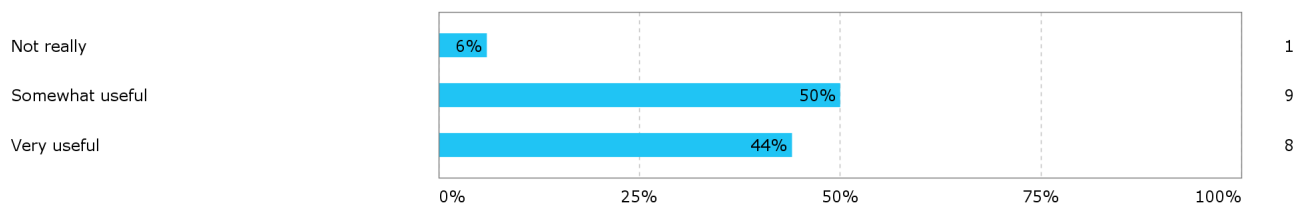
What did you think about the amounts of dialogue, discussion, and opportunities to ask questions during lectures?



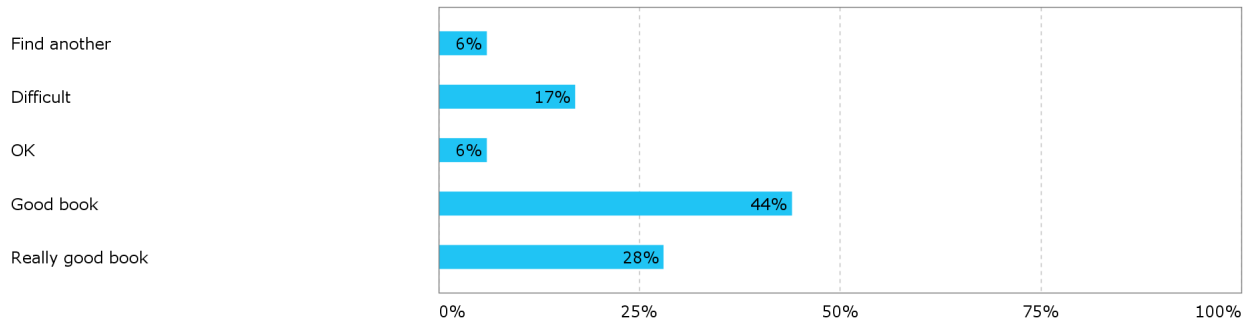
Were the "study guides" for Lawrence's lectures useful for you?



Did you find useful the orientation meeting on teaching and learning, and comments during the lectures about learning?



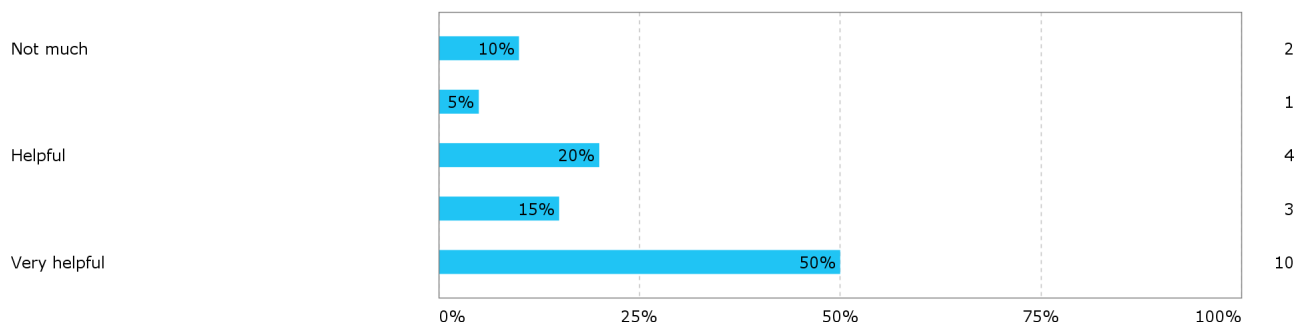
What was your general feeling about the book?



What did you think about the amount of reading?

- Although the book was very good, the reading was a bit too much. Especially because we did mostly 2 chapters weekly, it was difficult to keep up with so much reading next to other courses and personal life. This has led to a lot of catch-up reading (hundreds of pages) after the course had finished (before the exam) which is difficult, because I would have remembered the information better if it was not so much to read at once.
- Amount of reading was ok. The book had too many irrelevant details, and not enough about the main points.
- Some chapters were quite voluminous, but with the study guides you could focus on the the important parts.
- Probably a great amount of reading, but I liked the subject so it was not a problem for me.
- ok
- During the semester it was sometimes hard to stay up to date, with around 70 pages a week. But the reading was interesting and relevant, so I think, it was appropriate.
- Too much
- Too much unnecessary reading. A lot of the book was examples that was way too complex
- I think the book was a little bit heavy (I am norwegian), i used a lot of time trying to understand it in the beginning. I think it would be better with fewer chapters, and go deeper in each chapter.
- It took a long time to go through the chapters thoroughly; and on occasion the reading material was disparate with its equivalent lecture.
- It was right amount
- OK for 10p
- It is a lot to go through, but the book is enjoyable to read so it doesn't feel as bad.
- Jeg syntes det var mye pensum i forhold til hvor mye detaljer/ forsøk/grafer som sto der. Det tok mye tid å komme igjennom boka.
- A lot
- The lectures and the exercises covered the curriculum so well that the amount of time needed for reading the book where pleasantly low. Which is a good thing.

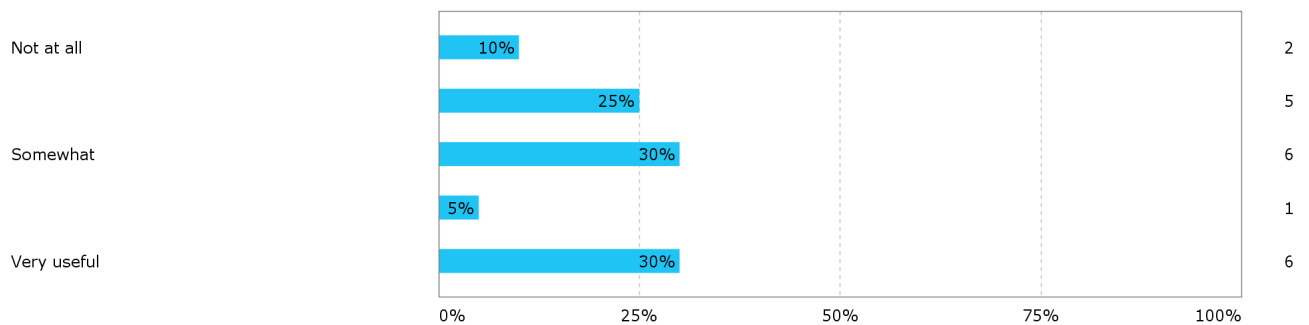
Did the three SimBio exercises (finch beaks, guppy spots, flower phylogenies) help you learn?



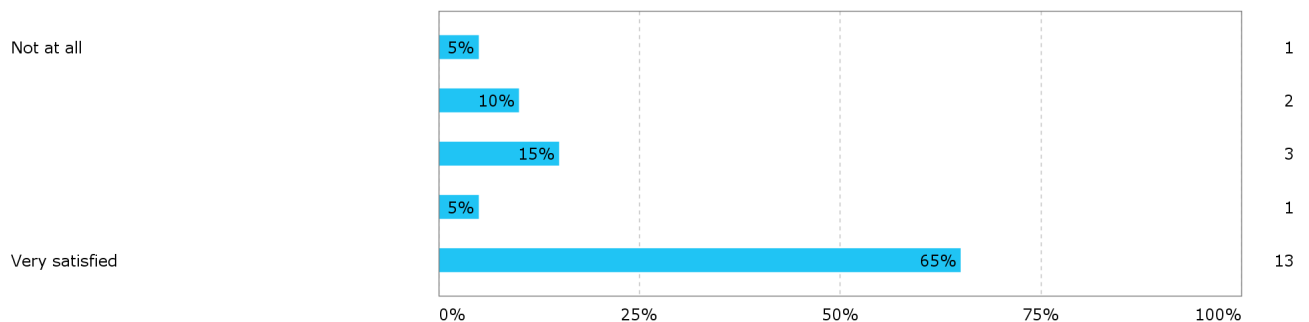
Do you have any comment on these labs? How could we learn more from them?

- I like them. You may consider giving a few more words on the guppy lab report.
- I don't know how we could learn more from them but I liked it, especially the guppy lab. We learned how to make a good report and it was great to run experiment virtually wwhile it would take years in reel life.
- Labs were good, because they were an opporutuity to use our new knowledge
- they were alright
- I think they went OK. It would be nice to get the first lab back before we started on the next one. And also maybe have a better briefing before the lab. i found the 2 lab very difficult. I liked the last lab best!
- Maybe some more complexity, or more difficult topics? They seemed somewhat simple (more high school level than uni). Still fun to play with and solidify your knowledge etc. Much rather have interactive assignments like these, than simply reading something as that leaves you thinking you have fully understood it when in fact you haven't. the labs quickly reveal what you aren't quite sure about.
- Jeg syntes det var bra at ikke alle var like omfattende som den første (guppy). Det var lærerikt og et godt supplement til boka
- Correcting the graded questions all together

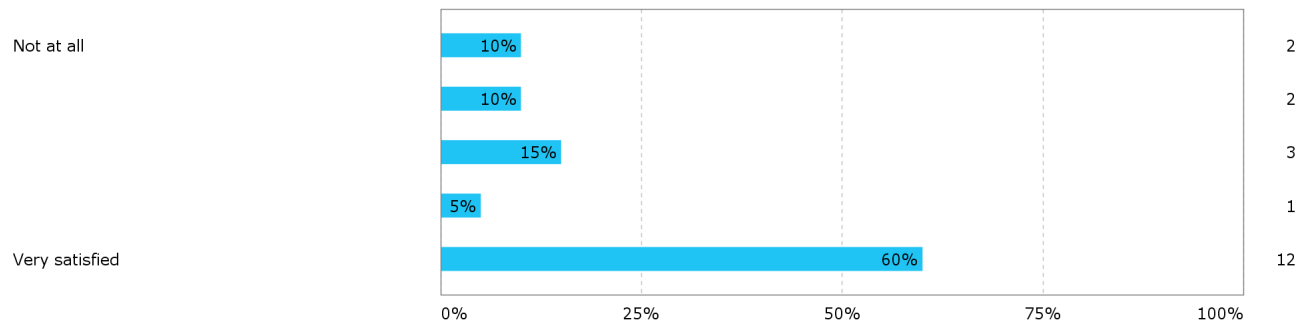
If you attended one or both of the oral exam review sessions: did you find the simulated oral exam useful?



How satisfied are you with the course information on MiSide?



How satisfied are you with the course information on Facebook?



What do you think of this balance? Would you have preferred that a large part of the grade was based on a written exam?

- About the final oral exam: I think 2 questions based on the midterm, and 2 based on the new material is the perfect balance. But I think it would be good if each Virtual Lab was worth 10% because they were quite a lot of work.
- No. I prefer oral exams and written work during the course.
- I am happy with the grading. It is somewhat different to most other courses.
- I think the balance is perfect. The oral exam is important.
- it was good system
- it was good. I like having a midterm, so you repeat everything the first time after a half a semester and I think it makes it stick better in my head, when I learn it the second time for the final exam
- I like the written exam, too nervous on the oral
- i think written exam is better than oral exam
- I think that its good to break up the balance of the grade (midterm+exam+labs) but i prefer that the midterm could count a little bit less, and the final exam (oral exam) count more because this semester was very busy for me (and also for others that i have talk with)
- I think oral exams are a great way to find out what the student really knows, so I was happy with this balance.
- OK
- maybe, i'm not sure
- I think it is good. I hate having everything resting on a 30min stressed-out oral exam. This mix made me much more comfortable as i sat there. And the fact that 2 of the questions from the MC appear in the oral exam gives a good opportunity to revise accordingly, and better handle the curriculum, which is rather substantial.
- Bra at karakteren blir fordelt utover flere kriterier. Balansen var bra
- The midterm should have counted for less. I misunderstood a lot of the multiple choice questions, even though I felt I understood the material and did well on labs and oral exam.
- It's fine
- Yes
- Nicely balanced.

Do you have any comments on the oral exam?

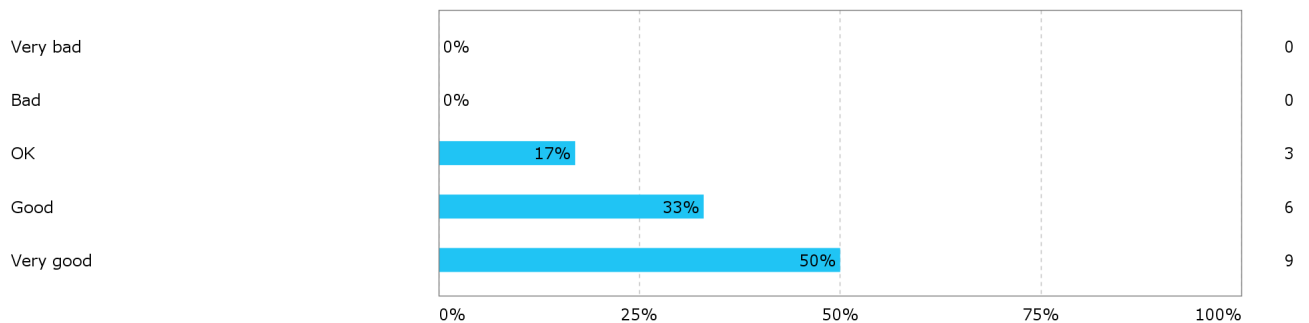
- Relaxed atmosphere, not a place to get nervous because both Lawrence and the other examiner were helpful and openly talking about the questions. It felt more like a discussion about the topics, rather than strictly answering each question. This was good.
- Nice way of doing it.
- Good to have 2 questions about midterm questions and 2 other questions. I think it is the right way to do it.
- good exam
- it was alright
- It was a very good atmosphere, and i think thats important to perform better!
- OK

- In general perfectly fine and relaxed, though the formulation of the questions could be better, maybe?
I much rather prefer a task, or situation explained to me, where some 'key words' should trigger the topic, rather than something so big and undefined as "what causes speciation". An intro/story before such a question would really help, as i can use it to figure out the scope of the question. The answer was MUCH more general than I expected it to be. It is a bit like being asked to throw a ball at a target, but you don't see the huge target in front of you because you are looking for something difficult to hit.

This was also the case for some of these socratic questions, where the formulation left me (and others) a bit confused. This critique is minor in comparison to the otherwise excellent course though!

- Jeg opplevde det som en positiv opplevelse med hyggelig sensor og "utspørrer"
- I think it was a good choice to have the final exam as an oral exam.

How would you score the course overall?



Finally, what did you like best about the course? Least about the course? What could we (the students as well as I) do differently, which would lead to better learning? Any other comments which did not fit into the other questions?

- I liked best: Lawrence always interacts a lot with the class during the lectures, and his enjoyable way of talking about the topics, to us.
I liked least: the large amount of reading from the book for each week.
- I really like the whole course, except the book. Well done, one of the best courses I've attended.
- For my taste we had group discussions too often. But I read most of the chapter after the lecture, that way I could better memorize the content better. I really liked the guest lectures. They gave another insight into the field. I also enjoyed the overall style of the lecture.
- I like the least the discussions. It was not really useful in my opinion. When other students were explaining the question they had and their answer, it was really difficult to learn about it because no time to really understand the question.
- presentations were good and teacher was very good speaker, maybe more virtual labs would be nice
- loved the everyday examples, like the excursion about placebos or the flute playing!
- Maybe we should get the first lab review back, before we do the second one. More discussions!! :-)
- I think the powerpoints were messy and not very helpful if you missed a lecture. Information given was also in general pretty bad. There was also a lot of unnecessary information in the lecture, that was not even part of the curriculum.
- I liked to break up the lectures with socratic quiz. But instead of using it in the start of the lecture, I think it would be better in the end to test us of what we have learned during the lecture. And also because its easy to loose focus in the end of a lecture (in any course!)

- I feel that the combination of lectures and reading material gave me a much greater view of evolutionary principles. Encouraging more discussion would aid learning, I feel, however this relies on students being more interactive rather than the lecturer.
- I really enjoyed all the lectures, with interesting topics and enthusiastic lecturers.

What I liked least was the way we were given messages throughout the semester. Often with messages and counter messages. Some were given on Facebook (sometimes too many, too often), MiSide or documents in Fillager. It was missing the clear and easy-to-find overview of important messages.

Also, as in all 10pt courses the amount of readings are quite big. It should be a better way of knowing what to focus more on, rather than the Study Guides, which I was given the impression would be the most important. During the Oral Exam, it was clear that that was not the case.

- Lawrence did a great job. Anyone who brings flutes to start of the topic of sexual selection gets an A in my book!

The book is also very, very good. I particularly like how it presents a new field by introducing the scientists' first explanations/discoveries, and then disproving, modifying or providing better alternative hypotheses, so that we as students can see the progress in the field in a chronological way. It is a great way of getting a brief overview of what are becoming very big topics, and as such provides a good starting point for those who want to explore additional lit.

- Best: Temaet er interessant
Verst: Mye og tungt stoff å sette seg inn i

Til neste gang: Lage study guides til alle kapitlene (dersom de er relevante å kunne). Ikke legge så mye vekt på å få inn gjesteforelesere som har mye faglig ekspertise, men også noen som har litt mer trening i å formidle det. (Noen av gjesteforeleserne var ganske vanskelig å følge med på)

- I liked best the lectures with laurens because I like the way he explains. I also liked so much the labs although it was too much work, but I learned a lot and I enjoyed it. What I liked least about the course was the lectures with other professors. Correcting all the socrative tests, graded questions, exams etc together in class would lead to better learning
- I really liked the digital exercises we had with the SimUText program, a fun way to learn.