



Example template – Course analysis (course evaluation)

Course code 1BI048	Course title Molecular Medicine – Cardiometabolic and Infectious Diseases	Credits 15
Semester HT2023	Period 2023-10-30 – 2024-01-12	

Course coordinator Hanna Björck (Deputy Course Director) Christopher Sundling (Course Director) Mari Liljefors (Course Administrator)	Examiner Rachel Fisher
Teacher in charge of component Hanna Björck (Cardiometabolic diseases) Christopher Sundling (Infectious diseases) David Plaza and Xiao-wei Zheng (Research application) Magdalena Paolino (Lab – Methods in Molecular Biology) Sampath Narayanan + Glykeria Karadimou (Journal clubs)	Other participating teachers A range of teachers, both from within and outside the Department of Medicine (Solna), including both clinicians and researchers (from KI and/or KS).

Number of registered students during the three week check 53 (incl. 8 exchange students and 3 re-registered)	Number approved on the last course date 43	Response frequency course evaluation survey 50.94 %
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Other methods for student influence (in addition to concluding course evaluation)

The course had two course councils. One was held three weeks after the start of the course with course representatives, and the second was held on the last day of the course. The last course council/course evaluation was open for all students to attend.

Students were encouraged to give continuous feedback either directly to the course leaders or to the class representatives. We also had a question/discussion forum set up on Canvas where the students could post questions on each part of the course, although this has been minimally used.

Feedback reporting of the course evaluation results to the students

The short summary of the course survey was published on the open course website (drupal) upon survey closure. The course analysis was made available on the same site. A link to the survey was also placed on the HT23 Canvas syllabus page. Specific issues brought up by the students in the course evaluation were commented on in the course analysis.

Results of the course evaluation from the previous course (HT22) were presented at the introductory lecture for HT23, discussing strengths and weaknesses that were brought up by previous students. Changes that had been made (content and structure) were presented and explained in the context of the results of the survey. The importance of collecting feedback from students for developing and improving the course was highlighted.



Note that...

The analysis should (together with a summarising quantitative summary of the students' course evaluation) be communicated to the education committee at the department responsible for the course and for programme courses and also the programme coordinating committee.

The analysis was communicated to the education committee on the following date: 2024-02-22

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1. Description of any conducted changes since the previous course occasion based on the views of former students

1) The course syllabus was modified in 2021 and 2022. In 2021 we re-wrote learning outcomes to further highlight the main aim and intended learning outcomes of the course. In 2022, we changed some of the goals to be clearer, and to include global equality perspectives and sustainable development. As we've done the previous year, we emphasized that the main aim of the course is to train the students in skills and competencies that are necessary for biomedical research, e.g., critical thinking/analysis, designing a research project, interpreting, and presenting data, giving, and receiving constructive feedback and acting upon this feedback, while using the topics of cardiometabolic and infectious diseases to achieve these aims.

2) Based on feedback from previous years, we had reduced the lecture content slightly and organized them in topic-specific blocks. For this year, to cover the increased focus on critical thinking, and taking a global equality and sustainable perspective, we introduced lectures on experimental setup, methodology, and global health equality.

3) Journal clubs have previously been conducted in a half-class. This semester, groups were made smaller (12-15 students/group) to promote discussion and active participation. A teacher participated in each group.

4) We introduced an examination of the basic usage of a microscopy in the infectious disease lab, where the students were tasked to find the cell plane, increase focus, and use oil to identify individual cells/parasites.

The above changes are in line with preparing the students for their Bachelor's thesis, which follows directly after this course. The "Molecular Medicine – Cardiometabolic and Infectious Diseases" course should function as an opportunity for the students to review what they have learnt previously in the programme and apply this in a range of scenarios. We have further added the aspects of considering and reasoning around health and biomedical research from a global sustainability perspective. Particular focus has been on to visualize this for the students.

2. Brief summary of the students' evaluations of the course

(Based on the students' quantitative responses to the course evaluation and key views from free text responses. Quantitative summary and any graphs are attached.)

Overall, the course is going well and almost all scores on the questions in the survey remained at a high level (Figure). There were some exceptions, reflected primarily in the mean but not median, indicating a selection of students were discontent with the "common theme" and constructive alignment in content and examination.



Questions	Mean				Median			
	2020	2021	2022	2023	2020	2021	2022	2023
In my view, I have developed valuable expertise/skills during the course	2,7	3,1	3,3	3,7	3	3	3,5	4
In my view, I have achieved all the intended learning outcomes of the course	3,1	3,3	3,5	3,7	3	3	4	4
In my view, there was a common theme running throughout the course – from learning outcomes to examinations	2,1	2,6	3,2	2,4	2	3	3	3
In my view, the course has promoted a scientific way of thinking and reasoning	3,2	4	4,1	4	3	4	4	4
In my view, during the course, the teachers have been open to ideas and opinions about the course's structure and content	2,4	2,9	3,8	3,2	3	3	4	3
do you feel that the workload during the course was reasonable in relation to the extent of the course/number of credits awarded	2,6	2,9	3,5	3	3	3	4	3
course structure and methods used were relevant in relation to the learning outcomes	2,7	3,3	3,4	3,3	3	3,5	3,5	4
examination was relevant in relation to the learning outcomes	2,6	2,9	3,1	2,6	3	3	3	3
I took responsibility for my own learning during this course	4,1	4,3	4,1	4	4	4	4	4
When/if I had questions or problems with the course content, I felt that I could turn to my teacher/supervisor for guidance	2,9	3,5	3,8	3,7	3	3,5	4	4
The feedback that I have received has been important for my development and learning	2,7	3,6	3,6	3,6	3	4	3,5	4
What is your overall opinion of the course	2,4	2,8	3,4	3	2	3	3,5	3
I have developed my ability to critically appraise the work of others	3	3,2	3,5	3,7	3	3	4	4
I have received critical appraisal of my own work	3	3,6	3,7	4	3	4	4	4
The course provided me with opportunities to learn about relationships between cardiometabolic and infectious diseases	2,9	3,4	3,6	3,8	3	4	3,5	4
The digital learning environment such as Canvas, Zoom etc. was adequate.	3	3,4	4	3,8	3	4	4	4
Sum	45,4	52,8	57,6	55,5	47	55	59,5	59
Overall average	2,84	3,3	3,6	3,47	2,94	3,44	3,72	3,69

Similar to previous years, the students greatly appreciated the research application exercise, the two assignments, and labs. They especially appreciated the cardiometabolic lab as it addressed both planning, execution, analysis, and presentation/writing. Students also expressed that they received and were thankful for all the feedback. The students thought that the course had promoted a scientific way of thinking and reasoning, which is a key goal of the course, and that they felt more prepared for the coming project work.

Areas of improvement indicated by the students included that there were too many deadlines and many different learning activities making it difficult to keep track of things. They wished that the overall structure and alignment would be optimized. Several students also thought that the workload was very heavy and that learning activities after the exam made it difficult to focus on the exam. Several students also thought the constructive alignment between course content and exam questions should be improved, that the expectations were unclear and that the course material was relatively disconnected from each other and like separate learning tracks. Some students also expressed that it's unfortunate that the grading is based on the final exam and not the other learning activities that better promote the course aims.

3. The course coordinator's reflections on the implementation and results of the course

Strengths of the course:

Overall, the course contains several different learning activities that aim to promote a high level of student engagement and "real-world" exercises and experience. These are usually also appreciated by the students and include:

- A **research application** that encourages independent thinking and gives the students practice not only in designing an appropriate experimental setup but also in working together as a group. Students are also practising peer reviewing, which is known to enhance students learning.
- **The two main labs** cover important methodologies for molecular studies and disease diagnosis. Especially the first lab takes the students through the whole process from set up and design of experiments, acquiring and analyzing data, interpretation of results, as well as presentation and communication of conclusions. The second lab focuses on how diagnostic methods are implemented and how they need to be interpreted in the context of the patient to make sense. The methodology is, however, largely overlapping with the first lab. Peer-reviewing, which is incorporated in the first lab, further enhances students' learning.
- **Assignments**, which include a complex research-based problem, provide a forum for discussion, and are highly appreciated by students. The discussion enables misunderstandings to be clarified and the student to achieve a better understanding of how different areas of biology are interconnected.
- **Journal club seminars** provide training in scientific reading, analysing and critically discussing published articles, which promote the development of critical thinking and presentation skills.

Weaknesses of the course:

- Although the course's objectives and learning outcomes have been improved over the past two years, there are still problems with the constructive alignment of the course and we need to work to improve the coherence between learning outcomes, learning activities and lectures, and the final examination.
- **Lack of a course textbook** (this makes it difficult for the students to know exactly what they should learn for the exam). This makes the students even more reliant on the lecture handouts, which have varying quality as study material.
- Journal clubs are used to highlight the **connections between cardiovascular/metabolic and infectious diseases**. Additional lectures have been introduced, but many students still find it hard to see how the topics overlap. This is potentially further exaggerated by the many different learning activities which focus on slightly different things topic-wise making it difficult for the students to see how different types of information fit together in a coherent manner.
- **Overlap** in topics to previous courses in the program. During the course introduction, we emphasize that some previous course content may re-appear during the course but deepened and in a disease context rather than from a physiological perspective. Also, although we try to make it clear that the topics cardiometabolic and infectious diseases are used as springboards to focus the students' learning in critical thinking, rationalization and deductions, experimental design, and scientific writing, the relatively large overlap seems to reduce student engagement in the topic. This is very different between students though, as some think there is much overlap, while others little. Some also think the overlap is good while others do not. Since the feedback is not clear, we will not further remove lectures at this stage.

3. Other views

Students have often brought up the difficulties of having many and sometimes overlapping deadlines. This comes largely from the many different learning activities of the course, including the research application, labs, journal clubs and assignments. These are all important parts of the course and tend to be mentioned as excellent parts of the course. One of the ILOs in the course is to take responsibility for your own learning, and being able to handle multiple deadlines is a key skill in later work life. However, since this is a recurrent comment, we need to think further on how we can organize the activities so that they contribute to a continuous learning progression while also being manageable for the students.

One additional point that often comes up is the inflexibility of the exam and research application presentation after the new year (at the end of the course). It is important to note that the time over Christmas and after the new year constitutes a significant part of the course and this is study time that is needed for preparing for the presentation and the exam. However, it is important how we schedule the activities and based on student feedback, it is better to have time-consuming activities (such as the research application presentations) after the exam.

4. Course coordinator's conclusions and any suggestions for changes

(If changes are suggested, state who is responsible for implementing them and provide a schedule.)

Student feedback indicates that topics related to experimental and study design are valuable and could be expanded further. This is currently addressed in different manners, including lectures, labs, JC, RA, and assignments, however, the students may not see the connection as clearly as the course coordinators. It could therefore be of value to further clarify the course layout, and how we use different learning activities to train similar skills in different contexts. For the coming year, we will work with visualization of learning outcomes in relation to activities to clarify this better for the students. The two course leaders Christopher Sundling and Hanna Björck will lead the work and implementation.

We have had an R workshop during the 2021 and 2022 courses. The activity has been appreciated but the students would like to see it expanded further. Preferably with more practical sessions. The plan is to introduce such in the next course. The implementation will be led by Christopher Sundling.



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As already indicated in previous course analysis, the infection lab would benefit from an update to also include a planning component and a more engaged results analysis/interpretation. This update will be led by Christopher Sundling.

Journal clubs will be reformatted to focus more on ad hoc discussion and reflection. Some preparatory work, including answering questions in Canvas prior to the JC seminar will be removed to ease the workload. Figures, controls, results and experimental set up will be discussed to a greater extent.

Appendices: