

Example template – Course analysis (course evaluation)

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|------------------------------|---|----------------------|
| Course code 1BI048 | Course title Molecular Medicine – Cardiometabolic and Infectious Diseases | Credits 15 |
| Semester Autumn | Period 2022-10-31 – 2023-01-13 | |

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| Course coordinator Hanna Björck (Course Director) Christopher Sundling (Deputy Course Director) Mari Liljefors (Course Administrator) | Examiner Rachel Fisher |
| Teacher in charge of component Hanna Björck (Cardiometabolic diseases) Christopher Sundling (Infectious diseases) Nicolas Pillon + David Plaza (Research application) Magdalena Paolino, with assistance of Alexander Espinosa (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 47 (incl. 6 exchange students) | Number approved on the last course date 37 | Response frequency course valuation survey 47 % |
|--|--|---|

Other methods for student influence (in addition to concluding course valuation)

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, after the exam and oral presentations of the research application. 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.

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 as well as the course analysis was also placed on the HT22 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 (HT21) were presented at the introductory lecture for HT22, 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: 2023-03-24

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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, re-writing learning outcomes to further highlight the main aim and intended learning outcomes of the course. This year, we spent much time in the course introduction to explain the purpose/ILOs of the course and further emphasized the different components of the course. The goal was to make it clear 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. The main focus is not to learn about the interplay between cardiometabolic and infectious diseases. The topics are rather used to support the primary aim of developing the student's scientific approach.

2) Several lectures were removed or exchanged to reduce redundancy with previous courses. Lectures were also set in blocks according to student feedback, to increase coherency. We had since previously introduced more lectures on research methodology, and we expanded this part further by also having an R-workshop. This was well appreciated and will be expanded further in the coming courses.

3) Student feedback indicated that the course content was not optimally distributed, making it sometimes tough with multiple of deadlines, and sometimes light with few deadlines. Also, the fact that multiple course components were running in parallel was considered stressful. Therefore, this year we set the Assignments to complete earlier (before the Research Application), which was appreciated by the students. We also clearly indicated deadlines and tried to be more consistent with when deadlines were set.

4) The students often express that it's difficult to know what will come on the exam, especially since we tell them that *any* course content (including labs, assignments, lectures etc.,) can come on the exam. Also, since there is no specific course literature, students feel uncertain if they learn/study the right thing. Therefore, this year we made two main changes,

i) instead of asking the teachers to include a slide with key take-home messages from their lecture, we asked them to begin with a slide with the lectures specific ILOs. In this way, the students know what to expect and what they should be able to answer after that particular lecture.

ii) we established a multiple-answer question (MAQ) database with approximately 100 questions covering all lectures. We made this database available to the students and let them know that we would include a number of the MAQs on the exam. This raised the overall score on the exam MAQ section substantially. The database will be further expanded in future courses.

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.

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

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

Overall, the course is progressing well and almost all scores on the questions in the survey were higher this year compared to the years before (Figure). This trajectory has been consistent over the last few years, clearly indicating that the previously introduced changes are improving the course and student satisfaction.

| Questions | Mean | | | Median | | |
|--|------|------|------|--------|------|------|
| | 2020 | 2021 | 2022 | 2020 | 2021 | 2022 |
| In my view, I have developed valuable expertise/skills during the course | 2,7 | 3,1 | 3,3 | 3 | 3 | 3,5 |
| In my view, I have achieved all the intended learning outcomes of the course | 3,1 | 3,3 | 3,5 | 3 | 3 | 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 | 3 | 3 |
| In my view, the course has promoted a scientific way of thinking and reasoning | 3,2 | 4 | 4,1 | 3 | 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 | 3 | 4 |
| 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 | 4 |
| course structure and methods used were relevant in relation to the learning outcomes | 2,7 | 3,3 | 3,4 | 3 | 3,5 | 3,5 |
| examination was relevant in relation to the learning outcomes | 2,6 | 2,9 | 3,1 | 3 | 3 | 3 |
| I took responsibility for my own learning during this course | 4,1 | 4,3 | 4,1 | 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 | 3,5 | 4 |
| The feedback that I have received has been important for my development and learning | 2,7 | 3,6 | 3,6 | 3 | 4 | 3,5 |
| What is your overall opinion of the course | 2,4 | 2,8 | 3,4 | 2 | 3 | 3,5 |
| I have developed my ability to critically appraise the work of others | 3 | 3,2 | 3,5 | 3 | 3 | 4 |
| I have received critical appraisal of my own work | 3 | 3,6 | 3,7 | 3 | 4 | 4 |
| The course provided me with opportunities to learn about relationships between cardiometabolic and infectious diseases | 2,9 | 3,4 | 3,6 | 3 | 4 | 3,5 |
| The digital learning environment such as Canvas, Zoom etc. was adequate. | 3 | 3,4 | 4 | 3 | 4 | 4 |
| Sum | 45,4 | 52,8 | 57,6 | 47 | 55 | 59,5 |
| Overall average | 2,84 | 3,3 | 3,6 | 2,94 | 3,44 | 3,72 |

In the last survey, the students greatly appreciated the research application exercise, the two assignments, and labs. Students also expressed that they received and were thankful for all the feedback and experienced the course as very interactive. Specifically, 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, to a relatively large extent, had achieved the course's learning outcomes. Further, students felt that they took great responsibility for their own learning during the course. Contrasting with last year there were no comments on the workload challenge, indicating our changes to the schedule at the beginning of the course were helpful.

Areas of improvement indicated by the students included that there were many "small" deadlines throughout the course and some at the same time. Several students also thought the overlap with previous program courses was considerable and therefore somewhat redundant. It was also still relatively unclear to some students what was expected on the exam and several mentioned that the exam and research application presentation at the end of the course made it difficult to organize travelling to and initiating international projects.

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

Strengths of the course:

- The **research application** 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. 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:

- The **course's objectives and learning outcomes** would benefit from even further clarification to improve 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).

- Journal clubs are used to highlight the **connections between cardiovascular/metabolic and infectious diseases**. However, this needs to be further improved by introducing selected lectures. The possibility for zoom lectures may open up the possibility to inviting lecturers focusing on the interplay.
- **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 more advanced and in a disease context rather than from a physiological perspective. Additionally, previous exchange students have felt that it was good to repeat the topics, as they have not necessarily studied them to the same extent as those in the BSc program. Although we try to make it clear that the topics cardiometabolic and infectious diseases are used as springboards to focus the students' learning on critical thinking, rationalization and deductions, experimental design, and scientific writing, the relatively large overlap seems to reduce student engagement in the topic. Despite not having reached the level we are aiming for. Reducing the lecture material further and expanding other learning activities, could promote further student engagement and satisfaction. A change in the course name would then be needed and helpful.

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. We will therefore retain the current course layout, although we will strive for a schedule that is well-balanced.

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 and that the course dates have been set by KI and cannot be influenced by us.

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.)

New lectures will be introduced and some old ones may be modified or removed. We will work to highlight the SDGs and Agenda2030 in existing lectures to accommodate newly introduced changes to the syllabus, We would like to further prepare students for their Bachelor's thesis by introducing a specific lecture on experimental study design and a lecture related to biological controls. In addition, new lectures related to novel cell- and molecular techniques and bioinformatic data analysis and visualization have been added and an extended R-workshop will now also be included so that students will get to practice bioinformatic analysis. Hanna Björck (Course Director) and Christopher Sundling (Deputy Course Director) will be responsible for this implementation.

Integration of digital tools to support student learning activities and teachers will be further advanced. The responsible person for this development is Mari Liljefors (course administrator).

The infection lab needs to be updated. Christopher Sundling has applied for funding to do this and has started to work on identifying how the lab could be updated.

Appendices: