Course analysis (course evaluation)

Course code 5MT010	**Course title** Molecular Genetics and Genomics	**Credits** 5
Semester (VT/HT-yr) HT26	**Dates** 2026-09-02 - 2026-10-15	

Course Director Fulya Taylan	**Examiner** Fulya Taylan
Teachers in charge of different parts of the course Fulya Taylan	**Other participating teachers** Michela Barbaro, Lucia Cavelier Franco, Angelica Delgado Vega, Jesper Eisfeldt, Marlene Ek, Sanna Gudmundsson, Zahra Haider, Anna Hammarsjö, Hafdís Helgadóttir, Anders Kämpe, Maria Pettersson, Angelo Salazar Mantero, Isabel Tapia Paez

Number of registered students at the 3-week check 36	**Number passed at final course day** 34	**Response frequency course valuation survey** 19/36 (52.8%)
Other methods for student influence (in addition to the final course valuation/survey) Course council with the entire class during the course (2026-09-14)		
Feedback reporting of the course evaluation results to the students Published on the open course web page **2026-11-09**		

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 also to the programme coordinating committee.

The analysis was communicated to the education committee on the following date: **2026-11-09**
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1. Description of changes implemented since the previous course occasion based on the views of former students, and in relation to the Course Director's conclusions and suggestions for change in the previous course analysis. If changes proposed in the previous course analysis have not been implemented, please explain why

Following the HT25 course evaluation and the suggestions in the previous course analysis, the course was substantially restructured for HT26. Students had asked for more teacher-led instruction, a lighter reading load and clearer expectations. In response, the course moved from a flipped-classroom model with student-led presentations to a lecture-based model delivered by a larger teaching team of more than ten teachers, each teaching a topic close to their own expertise. Elements of the flipped classroom were kept to a minimum.

Of the 24 suggestions in the previous analysis:

- 11 were implemented as planned;
- 3 were addressed in a different way;

- 7 were no longer applicable because student presentations and the flipped-classroom elements were removed;
- 3 have not yet been implemented and are planned for HT27.

Each area is described below.

Teacher-led instruction and course structure

- Each session now started with a teacher-led lecture introducing the core concepts, terminology and scientific context.
- The teachers highlighted the most important concepts in their slides. In most sessions the slides were published on Canvas before the lecture, so students could prepare and revise.
- Weekly overviews of the learning objectives were not introduced. Instead, the intended learning outcomes for the whole course were presented at the course start. Weekly overviews will be introduced in HT27.

Reading load

- The reading for each session was limited to 1-3 review or key research articles. Relevant textbook chapters were also listed for students who preferred to follow a course book.
- Discussion and guiding questions for the readings were removed. The suggestion to align the papers with these questions therefore no longer applied.
- The range of topics was broadened, with lectures on clinical genomics in leukaemia diagnostics and on cancer epigenetics, and a dedicated session with a lecture and workshop on complex diseases and polygenic risk scores.

Workshops
This year the workshops were designed and led by individual teachers, which gave each teacher freedom in format.

- Answer keys or worked solutions were given in some workshops, either during the session or at the end.
- The approach to tool demonstrations varied. Some teachers demonstrated a tool before the exercise and others afterwards, in line with the aim of letting students explore tools and databases themselves.
- The case-based rare-disease diagnostic workshop was retained, but no further case-based workshops were added because of the extensive restructuring this year.

A common workshop design, with clear instructions, defined learning outcomes and a short introductory demonstration, will be developed for HT27 using this year's student feedback.

Feedback and support

- Assessment criteria were made clearer. The rubric for the oral presentation was introduced at the course start, and students were reminded to consult it one week before the presentation.

- Peer feedback using the same rubric was introduced in the feedback session, moderated by teachers or senior PhD students. This worked well in some groups. In others it was less effective, because the instructions had not been communicated clearly enough to all groups. This will be improved.
- Structured feedback on practice presentations and optional individual feedback meetings were not introduced. Both suggestions concerned the practice presentations within the flipped classroom, which were removed this year.

Expectations and assessment

- Before the course, teachers aligned their teaching and learning activities with the intended learning outcomes.
- Students received an example written examination and a previous examination, so that they knew the format and level to expect. This was offered instead of a mid-course list of examinable concepts.
- Reading materials were no longer divided into background, presentation and exam-relevant categories, because the reading load was greatly reduced and student presentations were removed. Instead, students were told that the topics covered in the lectures and workshops were examinable. They had access to the lecture slides on Canvas, textbook chapters and 1-3 articles per session.

Flipped-classroom model

The suggested hybrid model was not implemented: a teacher lecture, followed by student presentations and teacher-moderated discussion, plus an orientation session on flipped learning. Given the restructuring and the involvement of more than ten teachers, all sessions were taught by teachers this year. A balanced format that again includes active student participation may be considered in future course occasions.

Workload distribution

- In coordination with the course director of Applied Communication, the oral presentation was moved one week earlier and the dates of the two courses' major deadlines were exchanged.
- About one week separated the graded oral presentation from the written examination, giving students time to prepare for each.

Additional elements

- Students visited the Clinical Genetics and Genomics unit at Karolinska University Hospital, the BioClinicum research facility and SciLifeLab Clinical Genomics, giving them insight into possible future workplaces.
- Clinically active teachers and guest lecturers from Clinical Genetics and Genomics illustrated the concepts with examples from Genomic Medicine Sweden and Karolinska University Hospital.

2. Brief summary of the students' evaluation 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.)

Response rate

19 of 36 registered students answered the course evaluation (52.8%). Because only about half the class responded, the results should be read with caution: the views of the 17 students who did not respond are unknown.

Quantitative results

Most ratings were positive. On a scale from 1 to 6, the median was 5 or 6 for every item.

Item	Mean (1-6)	Agree (5-6)	Disagree (1-3)
Could turn to a teacher for guidance	5.7	95%	0%
Structure and teaching methods relevant to the ILOs	5.1	79%	11%
Felt included and respected	5.0	74%	11%
Examination relevant to the ILOs	4.8	68%	11%
Feedback supported learning	4.7	63%	16%
Opportunities for active learning	4.4	53%	21%
Course as a whole was good	4.4	58%	21%

In addition, 89% of respondents (17 of 19) considered the workload appropriate for the credits, and none found it too low.

The lower means for the overall rating and for active learning come from a small group of respondents. Four students (11% of the class) gave a rating of 3 or lower on the overall course, and two gave the lowest possible rating (1) on several items.

Strengths highlighted in the free-text responses

Students valued:

- being taught by active researchers and clinicians;
- the clinical relevance of the content and the diagnostic tools used in practice;
- the study visit to the clinical and research facilities;
- the case-based workshops, especially those using gnomAD and IGV;
- the choice of papers for the oral presentation, and receiving the presentation topics a month in advance;
- the approachability of the teachers.

Several students said they learned a lot during the course.

Areas for improvement raised in the free-text responses

1. **Organization and coherence of the content:** Some students felt that topics were not always presented in a logical order, that content was sometimes repeated, and that the many teachers' contributions needed clearer links between them.

2. **Workshop structure and instructions:** This was the most widely shared comment. Students asked for clearer task instructions, for a short teacher demonstration at the start, and for the tools needed to be stated in advance. The UCSC Genome Browser workshop was mentioned specifically.
3. **Depth of the content:** Some students with previous genetics training found parts of the course superficial or repetitive. Others felt that too much prior knowledge was assumed. This reflects the diverse backgrounds of the student group.
4. **Written examination:** One student found the examination too easy. Two students noted that some IGV screenshots had low resolution, and that it had not been clear that IGV would be examined.
5. **Oral presentation:** Some students felt that its grading was subjective and placed too much weight on presentation skills. They also asked for more specific feedback before the graded presentation and for better consistency between the teaching assistants and the examiner.
6. **SDG module:** Some students considered the SDG component too extensive for this course, and felt that it would be a better fit for the Applied Communication course.

Interpretation

The critical comments should be read in the light of how they were distributed. Several comments appear under more than one question, sometimes with identical wording, and they show the same distinctive views. This indicates that most critical comments came from a small group of about two to five students, roughly 10% of the class. This group matches the small number of low ratings in the quantitative results (11%).

These comments are nevertheless taken seriously, as several of them also appear in milder form among students who were otherwise positive. This applies in particular to the workshop structure, feedback on the oral presentation and the readability of the examination images. Where the comments are concrete, they have been used directly to plan changes for HT27, described in section 4.

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

Strengths of the course:

1. **Clinically active researchers as teachers.** The teaching team consists of researchers who also work clinically. They are engaged and motivated, and they bring many real-life examples from clinical diagnostics, Karolinska University Hospital and Genomic Medicine Sweden. This links the course content directly to how genomics is used in research and healthcare today. Students valued being taught by people who use the methods themselves.
2. **Approachable teachers and a supportive learning environment.** Students rated teacher approachability highly (mean 5.7 of 6; 95% agreed). Most felt included and respected. This is an important foundation for learning, especially in a course with students from diverse educational backgrounds.
3. **Up-to-date content.** The course covers current developments in human genetics and genomics, including long-read sequencing, clinical genome analysis, regulatory

variation, polygenic risk scores and cancer genomics, using recent literature and tools used in practice.

4. **Appropriate workload and time for individual study.** Teaching was mainly scheduled in the mornings, leaving most afternoons for individual study. Almost nine out of ten respondents (89%) considered the workload appropriate for the credits, which shows that the reduced reading load introduced this year worked as intended.
5. **Connection to future workplaces.** The study visits to the Clinical Genetics and Genomics unit at Karolinska University Hospital, BioClinicum and SciLifeLab Clinical Genomics was appreciated. It gave students insight into where and how genomic medicine is practiced.

Weaknesses of the course:

1. **Organization of topics and coordination between teachers.** We were aware that the order of topics was not always logical and that some content was repeated between sessions. This was partly a consequence of the larger teaching team: with many teachers, it is harder to ensure that sessions build on each other. For HT27, we plan to:
    - reorganize the order of topics so that they progress from fundamentals to more advanced applications;
    - as course director, support the teachers proactively in preparing their lectures and teaching and learning activities, so that everyone knows what has been covered before and repetition is minimized.
2. **Structure of the workshops.** The workshops were designed independently by different teachers. Students therefore experienced differences in their structure and instructions. A common workshop format will be introduced for HT27, with clear instructions, defined learning outcomes and a short introduction to each tool.
3. **Level of the written examination.** Students found the written examination too easy, and an item analysis confirmed that many questions were answered correctly by nearly all students. We will revise the examination so that it assesses higher levels of Bloom's taxonomy, such as application, analysis and evaluation, in line with the course ILOs. Many questions have already been rewritten as case- and data-based questions.
4. **Image quality in the examination.** We were aware that some IGV screenshots had low resolution. New high-resolution illustrations have already been created for these questions and will be used from next year.
5. **The oral presentation as an assessment form.** The graded oral presentation has limitations. It may disadvantage students who find public speaking difficult, and it can measure presentation skills more than knowledge of molecular genetics and genomics. We are therefore redesigning this part of the assessment as an oral examination based on the course ILOs, with clear grading criteria shared in advance.

Other views:

Overall, the responses indicate that most students were satisfied with the course: every item had a median rating of 5 or 6, and the critical comments came mainly from a small number of students. However, only 52.8% of the class responded, so the results should be interpreted with caution. We do not know the views of the students who did not respond.

The critical comments are nevertheless valuable, because they are concrete and point to areas we had already identified. To strengthen the link to future workplaces further, we plan to extend the study visits next year to include the National Genomics Infrastructure (NGI).

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

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

Area of improvement	Suggestion for change	Responsible person	Time plan
Course structure and coherence	• Reorganize the order of topics so that they progress from fundamentals to advanced applications (Follow the chapter order in Human Molecular Genetics 5th ed). • Present the intended learning outcomes before the lectures (carried over from the HT25 analysis).	Course director	implemented HT27
Coordination of the teaching team	• Hold a teachers' meeting before the course to agree on content, sequence and links between sessions. • Map each session's content and ILOs, so every teacher knows what has already been covered. • Review lecture plans and teaching and learning activities with each teacher before the course, to minimize repetition.	Course director, with all teachers	Meeting April-June 2027; review of materials August 2027
Structure and instructions of the workshops	• Introduce a common workshop template: learning outcomes, written task sheet, expected output and the tools required. • Start each workshop with a short teacher demonstration of the tool. • Test-run each workshop before the course and redesign the UCSC Genome Browser workshop. • State which workshop content is examinable and share solutions after the session.	Course director, with workshop teachers	Template by June 2027; workshops ready August 2027

Area of improvement	Suggestion for change	Responsible person	Time plan
Level and quality of the written examination	• Revise the examination using the HT26 item analysis: replace items answered correctly by nearly all students with case- and data-based items at higher levels of Bloom's taxonomy, in line with the ILOs. • Use the new high-resolution illustrations (already created) for all image-based questions. • Perform an item analysis after every examination.	Course director (examiner), with teachers contributing questions	Examination revised by September 2027; item analysis after each examination
Assessment of the oral component	• Replace the graded oral presentation with an ILO-based oral examination: case discussion in groups of three. • Publish the grading criteria with descriptors for G and VG at the course start. • Calibrate examiners before the examination, and provide a formative mock oral examination with feedback during the course.	Course director (examiner); syllabus change to the programme committee	Syllabus revision spring 2027; implemented HT27
Judgement and approach ILOs	• Revise the four Judgement and approach ILOs so that they are assessable (analyze, evaluate, propose instead of reflect). • Embed teaching and learning activities throughout the course: a learning plan at the start and end of the course, and a short ethics, sex and gender, and representation check in each discussion session. • Assess the ILOs in the oral examination (one standing question per case) and in the written examination.	Course director; approval by the programme committee	Syllabus revision spring 2027; implemented HT27

Area of improvement	Suggestion for change	Responsible person	Time plan
SDG module	• Shorten and simplify the SDG activity to a maximum of 90 minutes, with fixed elements on gender (SDG 5) and planetary health (SDG 13). • Assess it as Pass/Fail with a short checklist. • Coordinate with the Applied Communication course to avoid overlap.	Course director, with the course director of Applied Communication	Spring 2027; implemented HT27
Active learning and practice before the examination	• Publish practice questions on Canvas for flipped-classroom and group work, in the same format as the examination. • Use the Judgement and approach activities (exam-style questions and oral-exam cases) as teaching and learning activities.	Course director	published at HT27 course start
Connection to future workplaces	• Extend the study visits to include the National Genomics Infrastructure (NGI) Stockholm.	Course director	HT27

Appendices:

1. 5MT010-HT26 Molecular Genetics and Genomics course evaluation report (short) without free text answers (pdf)
2. 5MT010-HT26 Molecular Genetics and Genomics (long) with free text answers (pdf)

Link to course survey report without free text answers: https://survey.ki.se/Report/5jQ4kUUD0Za