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Censor Report 2025: Biomedical Sciences Master Program

This report is based on multiple sources of information:

1) Insights from several PU meetings, including the information disseminated prior to these meetings.
2) Continuous monitoring of the program's website.
3) Minutes and attachments from PU meetings.

In my previous censor reports, I have noted that the program could benefit from a stronger emphasis on medical science in order to more clearly distinguish it from other master programs within the natural sciences. In this context, I would like to highlight two overarching directions that may merit consideration in future program development. First, there may be opportunities to further integrate several of the elective courses to improve coherence and academic progression. Second, it could be worthwhile to consider a compulsory first year with a more unified structure, aimed at introducing students to core areas of medical science as well as to contemporary methodologies in the field, including the rapidly developing computational tools and AI-based approaches.

The current list of recommended elective courses includes tumor biology, neuroscience, and immunity/infection, thereby addressing three major categories of human disease. While cancer, neurological disease, and infection/inflammation are represented in the current curriculum, broad overview courses in cardiovascular and metabolic diseases appear to be underrepresented. It would perhaps be possible to add a discussion on insulin signaling and diabetes in the course BMED330. Strengthening coverage in these areas would provide students with a more comprehensive and clinically relevant understanding of the principal causes of morbidity and

mortality in humans. In this context, I view the introduction of the courses HUIMM320 and HUPAT301 as a constructive step in the right direction. Furthermore, some of the challenges highlighted by the course coordinator for BMED340 (see below) could potentially be mitigated, at least in part, through a more coherent program structure with a greater proportion of compulsory courses. A reform along these lines could also save teaching resources and potentially improve the budget situation.

The elective courses also include 21 ECTS devoted to various computational tools used in the biomedical sciences. This domain, broadly referred to as bioinformatics, is undoubtedly central to modern bioscience; however, many of these elements could potentially be integrated more effectively within subject-specific courses, as suggested below. UiB already offers a dedicated master program in bioinformatics (MAMN-INFBI), and it is therefore a nontrivial strategic challenge to determine to what extent the Master Program in Biomedical Sciences should overlap with this program without losing its own distinctive profile.

One illustrative example concerns whether the program should include a course in programming. While extensive training in bioinformatics *per se* may fall outside the program's core remit, it can nevertheless be argued that students should be taught Python, as it is the primary language used to develop, deploy, and customize modern AI-based tools. Such competence would enable students to critically understand, validate, and adapt AI-generated code, rather than relying on these tools blindly.

BMED322: Methods in Biomedical Research (24 ECTS)
This course could potentially be shortened and integrated with other courses, for example, BMED326, BMED365 and ELMED219. Given the revised admission requirements for the program, students are now expected to have prior training in practical laboratory work in biochemistry upon admission. As stated on the program website: "There is a specific requirement that at least 10 of these credits must come from practical laboratory experience in biochemical or cell biological methods." This has implications for the relevance and added value of a seven-week "project work" that culminates in a written report. In addition, throughout the entire second year of the program, students work on an independent scientific project, through which they can develop skills in experimental design, data analysis, critical interpretation of results, and scientific reporting.
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HELVIT300: Introduction to Philosophy of Science and Research Ethics (5 ECTS)
Could be shortened

BMED326: Protein structure determination, validation, and analysis (5 ECTS)
This course could be modernized by introducing AI-based tools for protein structure prediction and analysis, such as AlphaFold. In addition, the course could be better integrated with BMED370 and BMED322 to strengthen conceptual continuity and practical relevance.

BMED330: Cell Communication and Intracellular Signaling (10 ECTS)

BMED331 Tumor Biology (10 ECTS)
Could be integrated with HUPAT301

BMED340: Cellular and Molecular Neuroscience (10 ECTS)

In the evaluation and comments by the course coordinator 2025 it is stated *"*In 2025, we encountered a new problem: only 2–5 students attended any given lecture. Some students did not attend lectures at all and appeared only at the mandatory workshops. We believe this was directly related to poor exam performance in approximately 50% of the students, including two failures. We do not understand why students enroll in a course if they are not interested in learning the material." (*translated by ChatGTP 5.2*)
"For 2026, we plan to extend the teaching period to approximately 12 weeks to ensure that students have sufficient time between lectures to read the assigned material." (*translated by ChatGTP 5.2*)
As judged from the scheme the course seems interesting and well balanced also containing a medical orientation in relevant disease spectra. It is somewhat strange that only 6 students from the Biomedical Sciences Master Program enrolled to the course.

BMED365: Computational imaging, modelling and AI in biomedicine (10 ECTS)
This course could be shortened, with selected components integrated into existing courses. Possibly, the sections on scientific writing and literature searching could be incorporated into BMED322. In addition, content related to protein structure analysis using AlphaFold and other publicly available AI-based tools could be integrated with BMED326.

BMED370: Computational methods for drug design (5 ECTS)
Could be integrated with courses BMED326 and BMED365.

ELMED219: Artificial intelligence and computational medicine (6 ECTS)
This course could be integrated with the other courses covering this subject.

HUIMM307: Basic course in flow cytometry (5 ECTS)

HUIMM320: Basic Immunology (5 ECTS)

HUMGEN301: Human Molecular Genetics (5 ECTS)

HUPAT301: Basic Human Pathology (5 ECTS)

I am fully aware of that the suggested changes are rather substantial, but possibly they can stimulate a discussion.

Finally, this censor notes that assessment practices, particularly take-home written examinations, are becoming increasingly challenging in the context of rapidly advancing and openly available AI systems. Early generations of such systems were prone to substantial “hallucinations,” but current tools have improved markedly and now constitute powerful instruments for information retrieval, synthesis, and language support. When used in a transparent and supervised manner, AI can substantially enhance learning outcomes for engaged students. These developments underscore the need for continued reflection on examination formats and learning objectives in order to ensure valid and meaningful assessment of student competence as is currently widely discussed.

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