Prof Jan-Olov Höög
Department of Medical Biochemistry
and Biophysics

ANNUAL REPORT 2018

Master's Programme in Biomedical Sciences, Faculty of Medicine and Dentistry, University of Bergen (UiB)

Programme sensor: Jan-Olov Höög, Professor, Dep of Medical Biochemistry and Biophysics (MBB), Karolinska Institutet, Stockholm

For 2018 the program committee asked the sensor's input on:

1. The quality of LAS 301 (6 stp)/302 (4 stp): Animal Science Course
2. The need for reduction in study points acquired between subjects with significant thematic overlap.
3. A new course Computational Methods for Drug Design.

SPECIFIC COMMENTS

1. Evaluation of Animal Science Courses

Background: Several of the students at our programme needs the LAS courses to be able to complete the lab-work for their thesis independently. These courses are approved at the UiB for master and phD student.
Previously the quality of the subject was deemed too low to be included in the elective subjects for the thesis. The program committee now wish to reevaluate this decision. The course will go through changes in the immediate future. The main topics will continue, but it will be a common course for all the universities in Norway and most of this will be online with the specific animal techniques in laboratories at the specific university the students attend

LAS courses are a prerequisite today for students examined from a Master's programme in the biomedical field. In most countries as well in entire EU the regulations and the ethical view on laboratory animals are changing/developing (read more regulated), thereby students that should be active in the area of bioscience need a basic knowledge in the field. Preferably, licensed to handle laboratory animals. It does not matter if students will work

Postal address
SE-171 77 Stockholm
Sweden

Telephone
+468-524 87740

Mail
jan-olov.hoog@ki.se

Web
ki.se

actively or not with animal experiments in the future. A knowledge is needed, either to run/design experiments or judge the need for animal experiments. The courses LAS301 and LAS 302 look from a syllabi point of view to cover the demands. However, just reading a course syllabus is not enough. In many cases is it a question how it's taught, i.e. will the lectures etc be at a level for Master's students.

In Sweden very similar discussions were running a couple of years ago. A new "LAS" course was developed at KI (shorter as compared to the UiB courses) in collaboration with a national network. See attachment for the KI syllabus. After passed that course the students are accepted to work with the specific laboratory animal under supervision.

Conclusion: From a syllabi point of view, the UiB courses fulfill the purpose of LAS courses. However, the courses have to be judge from a student and general academic points of view in addition.

2. Evaluation of overlaps

*Background:BMED330 (http://www.uib.no/emne/BMED330)It's been reported an overlap with the subject MOL201 M**olecular biology:***
(http://www.uib.no/emne/MOL201)

*BMED331 **Tumor Biology (http://www.uib.no/emne/BMED331)** overlap with MOL215 (http://www.uib.no/emne/MOL215)**Tumor Biology**.*

It is always a challenge with different backgrounds of students accepted to a Master's programme including overlaps as well as lack of knowledge. In the case with overlaps there are several options to solve this challenge. If the major group of students accepted to the Master's program have their Bachelor from the Molecular Biology at UiB the optimal solution would be to adjust BMED330 and 331 to the level from the previous courses. Probably, some minor overlap/repetition is needed. In addition, this can be an excellent opportunity to develop and include new knowledge in the courses "Cell Signalling" and "Tumor Biology".
From a judgement of course syllabi it can be stated; In the case of "Cell Signaling" the Master's course show a higher level of taxonomy in outcome (not just describe and explain). This is a good example of development between the different levels. If the teaching and examination are in line with the course outcome no credit transfer (reduction in credits) should be necessary. However, the syllabus for "Tumor Biology" is very much at the same level as the corresponding course at the Bachelor's level, especially for knowledge (explain and describe). For skills, the outcome expected for a Master's course are fulfilled. For this course, a credit transfer (reduction) should be introduced.
Another option is just to delete the overlaps from BMED330 and 331 and thereby shorten these courses with a number of ECTS/days. There should not be any problem to fill up the gap with other or new course needed in the biomedical area.
Finally, there is of course a possibility to give the specific students credit transfer from the Bachelor's courses (a reduction in study materials for the two Master's courses). Usually,

students have to pass a final examination anyhow, and some reduction in ECTS is not of great value.

Finally, from comparison of course syllabi there are overlaps between the programmes in these areas. Course schedules and lecture contents etc have to be compared in addition for judging more in detail.

Conclusion: This could be an excellent opportunity to develop the courses "Cell Communication and Intracellular Signaling" and "Tumour Biology" to be at the true front edge. Either combine the two courses or develop them independently. Both courses cover areas of fast development and are close to string research areas at UiB, which stress that the first choice should be to develop the courses instead credit transfer/reductions. However, if these two courses will be given in the same format in the near future some credit transfer/reduction has to be introduced. The latter is of course the less laborious way, but the programme will not gain of this.

3. Evaluate a new course, "Computational methods for drug design, 5 ECTS"

> *Background: Computational methods are routinely used to support the design of new drugs. A new course in "Computational methods for drug design" will be introduced in the Master's programme. Through practical exercises, the students will gain hands-on experience with industry standard modeling methods.*

The Master's programme needs a course in the field of advanced bioinformatics where drug design is one line. Other important lines are handling of big data, specifically genomic data, registers, and biobanks. The judgement of direction of the course should be from the student's need. If it is possible to connect a drug design course to the use of "big data" the course can be something more than just an ordinary "drug design course" and therebt be valuable in clinical settings.

If 5 ECTS is 3-3.5 weeks, the course can covers more than 5x2 hrs of lectures demonstrations. Probably there is need for background teaching in bioinformatics. If not already included, writing scripts to handle large amount of ligands and/or structures should preferably be included. Furthermore, at least one demonstration of a more advanced programme package than publically available is suggested, e.g. MolSoft ICM as a leading tool in the area. The focus on exercises as outlined in the course description is the preferred way to teach this subject, i.e. as much as possible computer time with assignments with feed back. The course literature is good a choice, however, will students read a 900-pages book for a 5 ECTS course? Furthermore, the final examination could be the virtual screening for given target as suggested for a group assignment. An individual screening as an examination will show that the students can handle the computer programmes in an accurate way.

FINAL COMMENTS

The quality of LAS 301 (6 stp)/302 (4 stp) – from the judgement of course syllabi these two courses will fulfill the requirements that can be set-up. For a complete judgement the specific feedback from students are needed. The student feedback is usually a way to develop the soft parts of a course.

The need for reduction in study points acquired between subjects with significant thematic overlap – credit transfer/reduction in study points for a large group of students should be avoided. The suggestion is to develop the courses to a more advanced level and in parallel update the course syllabi.

A new course Computational Methods for Drug Design – an advanced course in bioinformatics is positive way to develop the Master's programme further. The outline for the suggested course could be developed even further to include "big data" and with a focus on clinical challenges in parallel to strict drug development.

Jan-Olov Höög, programme sensor
Stockholm in January 2019