Master program in Computational Physics, Mathematics and Life Science

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1. **Welcome, coffee and light refreshments**
2. **Approval of agenda and minutes** from previous meeting
3. **Discussion of additional learning outcomes and admission criteria with an eye on specific study directions**
4. **Cost analysis**: Andreas will present how the sharing of expenses and teaching and other issues have been resolved by the ElDat program
5. **Start discussion of courses and/or modules to be developed**: Take a look at the courses listed at `http://mhjensen.github.io/CPMLS/doc/pub/Masterprogram/html/Masterprogram.html`.
6. **Start defining potential teachers and supervisors as well as external partners**
7. **Additional topics**

Some overarching inputs to guide(misguide) the discussion

We need to develop an identity for the program (and your ownership of the program). It is meant to be a multidisciplinary program. It is not a math, or chemistry or physics program. In recruiting there will be obvious and less obvious sociological barriers which may influence the way students (and our colleagues) perceive this MSc program. The discussions today aim at identifying and find solutions to some of these problems, namely

- Discussing the learning outcomes in more detail as well as reviewing the online description of the program (like overarching description of the program)
- Courses/modules to be developed and cost analysis when sharing courses
- Defining MSc thesis directions and pool of potential teachers

Timeline and outcomes

What should the outcome(s) of this meeting be?

1. Timeline and working groups for revising the text on learning outcomes etc
2. Timeline and working groups for modules, courses and MSc thesis directions/projects/teachers

Master program in Computational Physics, Mathematics and Life Science

The program is a collaboration between five departments and classical disciplines:

- Department of Biosciences
- Department of Chemistry
- Department of Informatics
- Department of Mathematics
- Department of Physics

The program is multidisciplinary and all students who have completed undergraduate studies in science and engineering, with a sufficient quantitative background, are eligible.

Structure and courses

The table here is an example of a suggested path for a Master of Science project, with course work the first year and thesis work the last year.

	10 ECTS	10 ECTS	10 ECTS
4th semester	Master thesis	Master Thesis	Master Thesis
3rd semester	Master thesis	Master Thesis	Master Thesis
2nd semester	Master courses	Master courses	Master courses
1st semester	Master courses	Master courses	Master courses

The program is very flexible in its structure and students may opt for starting with their thesis work from the first semester and scatter the respective course load across all four semesters. Depending on interests and specializations, there are many courses on computational science which can make up the required curriculum of course work. Furthermore, courses may be broken up in smaller modules, avoding thereby the limitation of 10 ECTS per course only. Some of these courses are listed below.

Structure and specialized modules

The program allows also for replacing regular courses with specialized modules of shorter duration. These modules will be developed by the program committee but can also be developed in an ad hoc basis and tailored to the individual projects. Specialized modules can amount to up to the full course requirement of 60 ECTS.

	10 ECTS	10 ECTS	10 ECTS
4th semester	Master thesis	Master Thesis	Master Thesis
3rd semester	Master thesis	Master Thesis	Master Thesis
2nd semester	Special module	Special module	Special module
1st semester	Special module	Special module	Special module

The above set up shows how courses may be broken up in smaller modules.

Presently available courses at UiO and NMBU

Here follows a list of suggested courses that students may include in their required course load.

- FYS4150 Computational Physics I
- FYS4411 Computational Physics II
- FYS4460 Computational Physics III
- INF5620 Numerical Methods for Partial Differential Equations
- INF5631 Project on Numerical Methods for Partial Differential Equations
- FYS388 Computational Neuroscience
- STK4520 Laboratory for Finance and Insurance Mathematics
- STK4021 Applied Bayesian Analysis and Numerical Methods
- MAT-INF4130 Numerical Linear Algebra
- MAT-INF4110 Mathematical Optimization
- ECON4240 Equilibrium, welfare and information
- MEK4470 Computational Fluid Mechanics

Thesis directions

The program aims at offering thesis projects in a variety of fields. The scientists involved in this program can offer thesis topics that cover several disciplines. These are

- Computational mathematics
- Computational mechanics and fluid mechanics
- Computational chemistry
- Computational physics
- Computational materials science
- Computational life science
- Computational informatics
- Image analysis and signal processing
- Computational finance and statistics
- Computational geoscience