Emnekode: *COURSE CODE:*	**BMED360**	Semester / år: SEMESTER / *YEAR*:	**Spring semester 2017**
Emnenavn: *COURSE NAME:*	*In Vivo Imaging and Physiological Modelling*		
Emneansvarlig: *COURSE COORDINATOR:*	**Arvid Lundervold**	Godkjent: *APPROVED:* (admin.)	Studieleder ved IBM 06.04.2018
Rapporteringsdato: *DATE OF REPORT:*	2017-Sep-26		

INNLEDNING / *INTRODUCTION*:

Kort beskrivelse av emnet, inkl. studieprogramtilhørighet. Kommentarer om evt. oppfølging av tidligere evalueringer.

SHORT COURSE DESCRIPTION, INCLUDING WHICH STUDENTS/CANDIDATES MAY ATTEND. COMMENTS TO CHANGES BASED ON PRIOR EVALUATIONS.

In Vivo Imaging and Physiological Modelling (10 ECTS) is a course mainly offered to students with a background in physics, computer science, mathematics or statistics, on bachelor level. The course is also among courses that have been offered for PhD candidates attending the Norwegian Research School in Medical Imaging, http://www.ntnu.edu/medicalimaging

The goal of the course is that the participants shall obtain theoretical and practical knowledge on functional and quantitative in vivo imaging in man and animal using magnetic resonance imaging (MRI) and computer-based image analysis.

8 students were registered for the course this semester, among them 5 Master's students in Biomedical Sciences (MAMD-MEDBI) and 2 Medical students at the Medical Student Research Programme (MEDFORSKL) at The Faculty of Medicine and Dentistry, and 1 visiting student from another educational institution in Norway. http://www.ntnu.edu/medicalimaging . Three students had to withdraw due to heavy load with other courses.

For course descriptions, visit http://uib.no/course/BMED360

For previous evaluation reports, please visit https://kvalitetsbasen.app.uib.no/popup.php?kode=BMED360

STATISTIKK / *STATISTICS* (admin.)**:**

Antall vurderingsmeldte studenter: *NUMBER OF CANDIDATES REGISTERED FOR EXAMINATION:*	**5**	Antall studenter møtt til eksamen: *NUMBER OF CANDIDATES ATTENDED EXAMINATION:*	**5**

Karakterskala *GRADING SCALE*		A:	B:	C:	D:	E:	F:
	«A-F»	2	1	1	1	-	-

The final grade is based upon an oral presentation of a personal project (80%) in combination with a MCQ / Quiz test (20%). In order to pass, the students also have to get approved a midterm assignment "The kiwifruit segmentation challenge".

Due to technical problems with the evaluation quiz at My UiB, only one of the attendees gave written feedback by e-mail.

In short:

"Som du kanskje har forstått, så har jeg ikke tenkt å ta eksamen i BMED360. Jeg ville bare gi en tilbakemelding om at dette ikke er pga faget (som jeg syntes er veldig spennende, supert satt opp og utført) men på grunn av andre faktorer, som blant annet en annen eksamen som kom for tett opp til den siste uka."

The course is both untraditional (very broad, very dense, in between faculties), challenging to give, and attractive to students from quite different disciplines. It brings together topics from mathematics, physics, computer science, biology and medicine focusing on how to extract quantitative anatomical and physiological information from in vivo imaging in time and space using modelling and computational approaches. The interdisciplinary design and selected topics seems to be increasingly important, and future challenges relates to (i) teacher resources, their background and motivation (include teachers / guest lecturers from other faculties / institutions); (ii) how to adapt new material / interface to similar (possibly upcoming) courses related to systems biology and systems medicine and bioinformatics, and also reduce topics that are not fitting well; (iii) make distinction between PhD and MSc level within the course and in the assessment; (iii) make use of modern tools for e-learning, assessment, and recruitment, and tools that support efficient learning where lectures / introduction of new topics is very densely packed (2 + 1 week).

To meet these challenges, see below. We have also started to replace MATLAB with the, partly easier, open source / freely available, and increasingly popular Python / Jupyter notebook framework.

MÅL FOR NESTE UNDERVISNINGSPERIODE – FORBEDRINGSTILTAK / *PLANNED CHANGES FOR THE NEXT TEACHING PERIOD – HOW TO BE BETTER:*

We are in the process of designing and introducing e-learning modules, supporting learning of selected topics in the course (e.g. basic principles of MRI, Python / Jupyter notebooks, image segmentation, statistical tissue classification and machine learning in imaging). For the production of such e-learning modules we will employ a scalable and accessible Open edX platform (https://akademix.no) planned to be used also in the recently funded Erasmus+ project Open Educational Resourced in Computational Biomedicine (OERcompBiomed).

This will make it easier for both UiB and external students to prepare for the course, study and keep in contact with the material independent of lecturing hours, and also as a source of information after the course has finished. Some of the modules can also be used as a supplement in other courses (e.g. OERcompBiomed) and for other groups of students. An updated course description was submitted to the PU on September 6th 2017.

We will also add that parts of the course have motivated, and will partly be incorporated in the new elective course ELMED219 (6 ECTS) for Medical students "Introduction to Computational Medicine and Biomedical Engineering" (http://www.uib.no/en/course/ELMED219)that is joint effort between Department of Biomedicine and Department of Computing, Mathematics and Physics at the Western Norway University of Applied Sciences, and will be given first time in January 2019.