AALBORG UNIVERSITET

CURRICULUM FOR MASTER IN PROBLEM BASED LEARNING IN ENGINEERING AND SCIENCE, 2019

MASTER
AALBORG

Link to this studyline

Link(s) to other versions of the same line:

Curriculum for Master in Problem Based Learning in Engineering and Science - 2013 (Version 2) - Aalborg

TABLE OF CONTENTS

§ 1: PREFACE

Pursuant to consolidation Act 172 of February 27, 2018 on Universities (the University Act) with subsequent changes, the following curriculum is established. The programme also follows the Joint Programme Regulations and the Examination Policies and Procedures for The Faculty.

§ 2: BASIS IN MINISTERIAL ORDERS

The Professional Master's Degree programme is organised in accordance with the Ministry of Higher Education and Science's Order no. 1187 of December 7, 2009 on Professional Master's Degree Programmes, Ministerial order no. 1188 of 7. December 2009 (the Part-Time Order) with subsequent changes, and Ministerial Order no. 1062 of June 30, 2016 on University Examinations (the Examination Order) with subsequent changes. Further reference is made to Ministerial Order no. 114 of February 3, 2015 (the Grading Scale Order).

§ 3: CAMPUS

The programme is offered in Aalborg.

§ 4: FACULTY AFFILIATION

The Master's programme falls under The Technical Faculty of IT and Design, Aalborg University.

§ 5: STUDY BOARD AFFILIATION

The Master's programme falls under Study Board of Techno-Anthropology and Sustainable Design.

§ 6: AFFILIATION TO CORPS OF EXTERNAL EXAMINERS

The Master's programme is associated with the external examiners corps on Nationwide engineering examiners (Mathematics, Physics and Social Science).

§ 7: ADMISSION REQUIREMENTS

Admission to the MPBL programme presupposes a relevant higher education, at least at Bachelor level and at least two years of relevant professional experience in teaching or similar occupation following completion of the qualifying exam.

Relevant bachelor educations are, for example: Bachelor of Engineering or Bachelor of Science within any field of engineering or science; Bachelor of Education.

Other admission requirements are

- English language proficiency at level B2 (CEFR), 6 (IELTS), 550 (TOEFL, ITP), or similar, i.e. written and oral command of English, sufficient to participate in online group discussions.
- Ability to and experience with synchronous and asynchronous communication using ICT.

Aalborg University may allow admission to applicants who do not fulfil the admission requirements but who are considered to have the necessary prerequisites to accomplish the study programme. The requirement of relevant professional experience cannot be exempted.

§ 8: THE PROGRAMME TITLE IN DANISH AND ENGLISH

The Master's programme entitles the graduate to the Danish designation Master i problembaseret læring i ingeniør- og naturvidenskab. The English designation is: Master of Problem Based Learning in Engineering and Science.

§ 9: PROGRAMME SPECIFICATIONS IN ECTS CREDITS

The master education is a research based continuing education, equivalent to a one-year full-time study (60 ECTS credits) and offered as a part-time study lasting two years, divided into four semesters and credited with 15 ECTS pr. semester.

§ 10: RULES CONCERNING CREDIT TRANSFER (MERIT), INCLUDING THE POSSIBILITY FOR CHOICE OF MODULES THAT ARE PART OF ANOTHER PROGRAMME AT A UNIVERSITY IN DENMARK OR ABROAD

The Study Board can approve that passed programme elements from other educational programmes at the same level replaces programme elements within this programme (credit transfer).

Furthermore, the Study Board can, upon application, approve that parts of this programme is completed at another university or a further education institution in Denmark or abroad (pre-approval of credit transfer).

The Study Board's decisions regarding credit transfer are based on an academic assessment.

§ 11: EXEMPTION

The Study Board's possibilities to grant exemption, including exemption to further examination attempts and special examination conditions, are stated in the Examination Policies and Procedures published at this website: https://www.studieservice.aau.dk/regler-vejledninger

§ 12: RULES FOR EXAMINATIONS

The rules for examinations are stated in the Examination Policies and Procedures published at this website: https://www.studieservice.aau.dk/regler-vejledninger

§ 13: RULES CONCERNING WRITTEN WORK

In the assessment of all written work, regardless of the language it is written in, weight is also given to the student's formulation and spelling ability, in addition to the academic content. Orthographic and grammatical correctness as well as stylistic proficiency are taken as a basis for the evaluation of language performance. Language performance must always be included as an independent dimension of the total evaluation. However, no examination can be assessed as 'Pass' on the basis of good language performance alone; similarly, an examination normally cannot be assessed as 'Fail' on the basis of poor language performance alone.

The Board of Studies can grant exemption from this in special cases (e.g., dyslexia or a native language other than Danish).

The Master's project must include an English summary. If the project is written in English, the summary can be in Danish. The summary is included in the evaluation of the project as a whole.

§ 14: REQUIREMENTS REGARDING THE READING OF TEXTS IN A FOREIGN LANGUAGE

It is assumed that the student can read academic texts in his or her native language as well as in English and use reference works etc. in other European languages.

§ 15: COMPETENCE PROFILE ON THE DIPLOMA

The following competence profile will be evident from the diploma:

A Master has competencies that have been acquired through a course of study based on an integration of research results and practical experience.

A Master is able to fulfil highly qualified functions in businesses, institutions and the like, through scholarship-based personal and academic competencies.

§ 16: COMPETENCE PROFILE OF THE PROGRAMME

The overall aim of this Master's programme is that participants achieve competences to act as change agents in applying problem based, project organised learning at different levels within engineering and science education.

A Graduate from the MPBL programme is expected to achieve the following knowledge, skills and competences:

Knowledge of:

- the theoretical pillars of PBL as well as distinctions between Problem Based Learning (PBL) and other teaching and learning approaches

- the core principles of different PBL models based on state of the art in current international research
- teaching and learning methods supporting PBL, including collaborative, active and blended learning methods
- change management theories applicable for a systemic institutional change to PBL

Skills to:

- analyse, discuss and document the development, use and implications of PBL principles in own teaching practice
- carry out and facilitate problem design as a trigger in PBL
- select and apply relevant scientific theories and methods to design and plan PBL educational experiments
- combine different teaching methods to support PBL, including collaborative, active and blended learning techniques
- select and apply appropriate methods for evaluating PBL experiments as well as established PBL practices
- analyse and discuss actors and factors influencing the need and potential for systemic change to PBL in an institution
- analyse pedagogical development strategies, procedures and dynamics of a specific educational institution by use of change management theories
- plan, structure, carry out, reflect on and document the outcomes from a scientific PBL project

Competences to:

- continuously develop own teaching practice by use of PBL methodologies
- display agency to implement PBL in alignment with the institutional context by developing strategies and action plans for change to PBL
- transfer experiences from PBL research, projects and practice to facilitate curriculum development in specific institutions
- manage educational change processes that are complex, unpredictable and require new educational models
- assess the transferability of PBL implementations in specific institutions in order to contribute to broader engineering education communities
- communicate principles, examples and outcomes of PBL to colleagues and researchers as well as to non-specialist stakeholders

§ 17: STRUCTURE AND CONTENTS OF THE PROGRAMME

The programme is a problem based and project organised study, structured in four semesters. A semester consists of one to three study activities which aims to give participants pedagogical knowledge, skills and competences within the fixed time frame specified in ECTS credits. A semester concludes with one or more examinations within a specific exam period. Examinations are described in the curriculum.

The first semester consists of a 5 ECTS project and two 5 ECTS courses, the second and third semester consist of a 10 ECTS project and a 5 ECTS course while the last semester is the Master's thesis (15 ECTS).

The academic progression of the programme is reflected in the project work. In semester 1 the participants write a personal teaching portfolio, including reflections on educational experiences and possible experiments. In semester 2 the project work includes design and planning of an educational experiment and in semester 3 the educational experiment is implemented and evaluated, if possible. Semester 4 is the Master's project where participants develop competences to manage complex and unpredictable educational change processes at institutional level within engineering and science education.

A total of 25 ECTS is assessed through external examination and a total of 40 ECTS is marked according to the 7-point grading scale.

Teaching format

The programme is based on a combination of academic, problem-oriented and interdisciplinary approaches to teaching and learning. Teaching formats include but may not be limited to the following methods:

- Individual portfolio work

- Team based project work
- Self-study and readings
- Online study group and project group work
- Project facilitation
- Thematic online sessions supporting the project work
- Blended learning based on self-study and group discussions
- Online seminars and workshops
- Web mediated assignments and exercises (individually and in groups)
- Self- and group reflection

The MPBL programme is an international, fully online programme; thus, in this programme advanced e-learning tools, including learning management platforms, video conferencing tools and other asynchronous and synchronous tools are used intensively.

§ 18: OVERVIEW OF THE PROGRAMME

An overview of the programme is depicted in the table.

Offered as: 1-professional						
Module name	Course type	ECTS	Applied grading scale	Evaluation method	Assessment method	Language
1 SEMESTER Development of Teaching Competencies						
Teaching Portfolio	Project	5	7-point grading scale	Internal examination	Written exam	English
Learning Theories and Curriculum Development	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
Collaborative Problem Design	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
2 SEMESTER PBL Models						
Design and Planning of a PBL Module	Project	10	7-point grading scale	Internal examination	Oral exam based on a project	English
PBL Models, Facilitation and Blended Learning	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
3 SEMESTER PBL Implementation and Evaluation						
Implementation of PBL	Project	10	7-point grading scale	External examination	Oral exam based on a project	English
Educational Evaluation and Management of Change	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
4 SEMESTER Master Project - Management of Change and Change Agency						
Master's Project - Management of Change and Change Agency	Project	15	7-point grading scale	External examination	Oral exam based on a project	English

1st semester: Development of Teaching Competences

Credit
15 ECTS

Aim
The semester aims to support participants' reflections on own teaching practice and experiences, based on knowledge about theoretical foundations of active and collaborative learning, including PBL, and knowledge about curriculum development models. Another aim is to support participants in developing problem design skills, in preparation for the problem based project in semester 2. Semester 1 consists of three study activities: one project and two courses.

Prerequisites
None other than admission requirements.

2nd semester: PBL Models

Credit
15 ECTS

Aim
The semester aims to support the participants in designing and planning an educational PBL experiment, based on knowledge of PBL principles and models, and knowledge of methods of facilitating students' learning. The semester consists of two study activities, a project and a course.

Prerequisites
The semester builds on knowledge obtained during the MPBL semester 1.

3rd semester: PBL Implementation and Evaluation

Credit
15 ECTS

Aim
The semester aims to support participants in developing competences to change educational practices and to evaluate such educational change processes. Another aim is to support participants in achieving knowledge about theories of educational change management and quality assurance systems, in preparation for semester 4. The semester consists of two study activities, a project and a course.

Prerequisites
The semester builds on knowledge obtained during the MPBL semester 1 and semester 2.

4th semester: Master's project – Management of Change and Change Agency

Credit
15 ECTS

Aim
The aim of the project is to support participants in developing competences to manage complex and unpredictable educational change processes at institutional level, within the context of engineering and science education.

Prerequisites
The Master's project builds on knowledge obtained during semesters 1-3.

§ 19: ADDITIONAL INFORMATION

§ 20: COMMENCEMENT AND TRANSITIONAL RULES

The curriculum is approved by the dean and enters into force as of September 1, 2019.

The Study Board does not offer teaching after the previous curriculum from 2013 after the summer examination period 2020.

§ 21: AMENDMENTS TO THE CURRICULUM AND REGULATIONS

Minor editorial changes have been made in connection with the digitalisation of the curriculum.