



AALBORG UNIVERSITET

**CURRICULUM FOR MASTER IN  
PROBLEM BASED LEARNING IN  
ENGINEERING AND SCIENCE - 2013  
(VERSION 2) - AALBORG**

MASTER  
AALBORG

MODULES INCLUDED IN THE CURRICULUM

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# TEACHING PORTFOLIO

## 2018/2019

### CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim of this project is to support the participants in developing and communicating own teaching competences, while reflecting on learning theories and curriculum models. It is a starting point for the participants to continuously develop their teaching competences.

After completion of this project you should have achieved skills and competences enabling you to:

#### LEARNING OBJECTIVES

##### KNOWLEDGE

- Reflect on the alignment of own teaching philosophy, teaching practice and specific choice of pedagogical and educational principles and methods
- Analyse and discuss the use of active learning principles with the aim of planning, experimenting and developing own teaching practice

##### COMPETENCES

- Reflect on and generalize own teaching experiences in the light of concepts, theories and methods presented in the course
- Communicate the results of the above considerations in a teaching portfolio, written in scientific language.

#### TYPE OF INSTRUCTION

The teaching format includes self-study, on-line group work, facilitation and feedback sessions

### EXAM

#### EXAMS

|                 |                       |
|-----------------|-----------------------|
| Name of exam    | Teaching Portfolio    |
| Type of exam    | Written exam          |
| ECTS            | 5                     |
| Assessment      | 7-point grading scale |
| Type of grading | Internal examination  |

### FACTS ABOUT THE MODULE

|              |                        |
|--------------|------------------------|
| Danish title | Undervisningsportfolio |
| Module code  | TBIPBLK17101           |
| Module type  | Project                |
| Duration     | 1 semester             |
| Semester     | Autumn                 |
| ECTS         | 5                      |

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|                            |                                 |
|----------------------------|---------------------------------|
| Language of instruction    | English                         |
| Empty-place Scheme         | Yes                             |
| Location of the lecture    | Campus Aalborg                  |
| Responsible for the module | <a href="#">Mona Lisa Dahms</a> |

## ORGANISATION

|             |   |
|-------------|---|
| Study Board | Studyboard for Techno-Anthropology and Sustainable Design |
| Department  | Department of Planning                                    |
| Faculty     | Technical Faculty of IT and Design                        |

# TEACHING AND LEARNING THEORIES

**2018/2019**

## CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim of this course is to support the participants in acquiring knowledge about learning theories and curriculum models, in order to analyse and reflect on the relationship to own practice. The course also supports the participants in developing a personal teaching portfolio.

After completion of this course you should have achieved knowledge and skills enabling you to:

### LEARNING OBJECTIVES

#### KNOWLEDGE

- Explain similarities and differences between a minimum of three different learning theories
- Describe and analyse advantages and disadvantages of these learning theories, specifically in relation to Science, Technology, Engineering and Mathematics (STEM) education

#### SKILLS

- Discuss and analyse the relationship between a minimum of three curriculum models and the above learning theories
- Reflect on potential use of learning theories and curriculum models in own teaching practice.

### TYPE OF INSTRUCTION

The teaching format is based on self-study, on-line lecturing, facilitating synchronous and asynchronous discussions and sharing of knowledge and experiences.

## EXAM

### EXAMS

|                 |                                |
|-----------------|--------------------------------|
| Name of exam    | Teaching and Learning Theories |
| Type of exam    | Oral exam                      |
| ECTS            | 5                              |
| Assessment      | Passed/Not Passed              |
| Type of grading | Internal examination           |

## FACTS ABOUT THE MODULE

|              |                                  |
|--------------|----------------------------------|
| Danish title | Undervisnings- og læringsteorier |
| Module code  | TBIPBLK17102                     |
| Module type  | Course                           |
| Duration     | 1 semester                       |
| Semester     | Autumn                           |
| ECTS         | 5                                |

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|                            |                                 |
|----------------------------|---------------------------------|
| Language of instruction    | English                         |
| Empty-place Scheme         | Yes                             |
| Location of the lecture    | Campus Aalborg                  |
| Responsible for the module | <a href="#">Mona Lisa Dahms</a> |

## ORGANISATION

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# COLLABORATIVE LEARNING AND SCIENTIFIC WRITING

2018/2019

## CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim of this course is to support the participants in developing collaborative skills based on theories of collaborative and cooperative learning and in developing skills in the art of scientific writing and argumentation. The course also supports the participants in the writing of the teaching portfolio.

After completion of this course you should have achieved knowledge, skills and competences enabling you to:

### LEARNING OBJECTIVES

#### KNOWLEDGE

- Discuss advantages and disadvantages of theories of collaborative learning

#### SKILLS

- Relate and apply these theories to your own situation as a participant in the MPBL study
- Write and argue according to standards of the professional community

#### COMPETENCES

- Independently participate in professional and interdisciplinary collaboration

### TYPE OF INSTRUCTION

The teaching format is based on self-study, on-line lecturing, sharing of knowledge and experiences facilitating synchronous and asynchronous discussions, on-line workshops, seminars etc.

## EXAM

### EXAMS

|                 |   |
|-----------------|---|
| Name of exam    | Collaborative Learning and Scientific Writing |
| Type of exam    | Written or oral exam                          |
| ECTS            | 5   |
| Assessment      | Passed/Not Passed                             |
| Type of grading | Internal examination                          |

## FACTS ABOUT THE MODULE

|              |   |
|--------------|---|
| Danish title | Kollaborativ læring og videnskabelig formidling |
| Module code  | TBIPBLK17103                                    |
| Module type  | Course  |
| Duration     | 1 semester                                      |

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|                            |                                 |
|----------------------------|---------------------------------|
| Semester                   | Autumn                          |
| ECTS                       | 5                               |
| Language of instruction    | English                         |
| Empty-place Scheme         | Yes                             |
| Location of the lecture    | Campus Aalborg                  |
| Responsible for the module | <a href="#">Mona Lisa Dahms</a> |

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# DESIGN AND PLANNING OF A PBL MODULE

2018/2019

## CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim of this project is to support participants in developing competences to design and plan educational experiments, based on PBL principles and including elements of curriculum and staff development.

After completion of this project you should have achieved competences enabling you to:

### LEARNING OBJECTIVES

### COMPETENCES

- Apply theories and methods presented in the semester courses to design and plan a PBL based educational experiment, adapted to the relevant context and the relevant group of students, including a description of tasks and roles of students and staff.
- Communicate, in writing and orally, the product and the processes of the project work in a project report, respectively a process analysis, adhering to scientific standards of written and oral communication

### TYPE OF INSTRUCTION

The teaching format is a group project, including self-study, on-line group work, project facilitation and feedback sessions.

## EXAM

### EXAMS

|                 |                                     |
|-----------------|-------------------------------------|
| Name of exam    | Design and Planning of a PBL Module |
| Type of exam    | Oral exam based on a project        |
| ECTS            | 5                                   |
| Assessment      | 7-point grading scale               |
| Type of grading | Internal examination                |

## FACTS ABOUT THE MODULE

|                         |                                       |
|-------------------------|---------------------------------------|
| Danish title            | Design og planlægning af et PBL modul |
| Module code             | TBIPBLK17201                          |
| Module type             | Project                               |
| Duration                | 1 semester                            |
| Semester                | Spring                                |
| ECTS                    | 5                                     |
| Language of instruction | English                               |
| Empty-place Scheme      | Yes                                   |
| Location of the lecture | Campus Aalborg                        |

|                            |                                 |
|----------------------------|---------------------------------|
| Responsible for the module | <a href="#">Mona Lisa Dahms</a> |
|----------------------------|---------------------------------|

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# PBL MODELS AND CURRICULUM DEVELOPMENT

2018/2019

## CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim of this course is to support the participants in acquiring knowledge about PBL learning principles, implementation of such principles in different PBL models and different models of curriculum development, including assessment of learning outcomes.

After completion of this course you should have achieved knowledge and skills enabling you to:

### LEARNING OBJECTIVES

#### KNOWLEDGE

- Discuss the relationship between PBL learning principles and learning theories
- Discuss and compare the applicability within your own institution of a minimum of three different PBL models, taking into consideration the institutional framework
- Discuss and compare advantages and disadvantages of a minimum of two different curriculum development models, in relation to a given curriculum to be implemented within your own institution

#### SKILLS

- Discuss and reflect on the principle of constructive alignment in curriculum development in relation to a given curriculum, for example, the curriculum in focus in the semester project work.

#### COMPETENCES

The teaching format is based on self-study, on-line lecturing, facilitating synchronous and asynchronous discussions and sharing of knowledge and experiences.

## EXAM

### EXAMS

|                 |                                       |
|-----------------|---------------------------------------|
| Name of exam    | PBL Models and Curriculum Development |
| Type of exam    | Written exam                          |
| ECTS            | 5                                     |
| Assessment      | 7-point grading scale                 |
| Type of grading | Internal examination                  |

## FACTS ABOUT THE MODULE

|              |  |
|--------------|--|
| Danish title | PBL modeller og undervisningsudvikling |
| Module code  | TBIPBLK17202                           |
| Module type  | Course                                 |
| Duration     | 1 semester                             |
| Semester     | Spring                                 |
| ECTS         | 5                                      |

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|                            |                                 |
|----------------------------|---------------------------------|
| Language of instruction    | English                         |
| Empty-place Scheme         | Yes                             |
| Location of the lecture    | Campus Aalborg                  |
| Responsible for the module | <a href="#">Mona Lisa Dahms</a> |

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# FACILITATION AND ACTIVE LEARNING

**2018/2019**

## CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim of this course is to support the participants in developing skills for facilitating students' collaborative and active learning processes in various teaching situation, in PBL and non-PBL environments.

After completion of this course you should have achieved knowledge and skills enabling you to:

### LEARNING OBJECTIVES

#### KNOWLEDGE

- Discuss advantages and disadvantages of a minimum of three different teaching methods for active learning

#### SKILLS

- Discuss and reflect on aspects of importance for the process of role transition from lecturer to facilitator, with reference to your own role as a teacher
- Apply and facilitate at least two different teaching methods for active learning in your own teaching
- Analyse and reflect on the effect of your use of teaching methods for active learning, including your role as facilitator

### TYPE OF INSTRUCTION

The teaching format is based on self-study, on-line lecturing, sharing of knowledge and experiences facilitating synchronous and asynchronous discussions, on-line workshops, seminars etc.

## EXAM

### EXAMS

|                 |                                  |
|-----------------|----------------------------------|
| Name of exam    | Facilitation and Active Learning |
| Type of exam    | Written or oral exam             |
| ECTS            | 5                                |
| Assessment      | Passed/Not Passed                |
| Type of grading | Internal examination             |

## FACTS ABOUT THE MODULE

|                         |                              |
|-------------------------|------------------------------|
| Danish title            | Facilitering og aktiv læring |
| Module code             | TBIPBLK17203                 |
| Module type             | Course                       |
| Duration                | 1 semester                   |
| Semester                | Spring                       |
| ECTS                    | 5                            |
| Language of instruction | English                      |

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|                            |                                 |
|----------------------------|---------------------------------|
| Empty-place Scheme         | Yes                             |
| Location of the lecture    | Campus Aalborg                  |
| Responsible for the module | <a href="#">Mona Lisa Dahms</a> |

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## IMPLEMENTATION OF CHANGE

**2018/2019**

### CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim of this project is to support participants in developing competences to manage educational change processes, including evaluation of such processes.

After completion of this project you should have achieved skills and competences enabling you to:

#### LEARNING OBJECTIVES

##### SKILLS

- Analyse pedagogical development policies and strategies of your own institution, with the aim of identifying potentials and barriers for change to PBL

##### COMPETENCES

- Develop and evaluate a strategy for implementing PBL in a self-chosen and specified situation/institution

### EXAM

#### EXAMS

|                 |                          |
|-----------------|--------------------------|
| Name of exam    | Implementation of Change |
| Type of exam    | Oral exam                |
| ECTS            | 5                        |
| Assessment      | 7-point grading scale    |
| Type of grading | External examination     |

### FACTS ABOUT THE MODULE

|                            |                                 |
|----------------------------|---------------------------------|
| Danish title               | Implementering af forandring    |
| Module code                | TBIPBLK17301                    |
| Module type                | Project                         |
| Duration                   | 1 semester                      |
| Semester                   | Autumn                          |
| ECTS                       | 5                               |
| Language of instruction    | English                         |
| Empty-place Scheme         | Yes                             |
| Location of the lecture    | Campus Aalborg                  |
| Responsible for the module | <a href="#">Mona Lisa Dahms</a> |

## **ORGANISATION**

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# MANAGEMENT OF CHANGE TO PBL

**2018/2019**

## CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim of this course is to support the participants in acquiring knowledge about theories of organisational development and theories of management, including evaluation, of educational change in higher education.

After completion of this course you should have achieved knowledge and skills enabling you to:

### LEARNING OBJECTIVES

#### KNOWLEDGE

- Discuss and analyse advantages and disadvantages of management models, particularly in relation to active learning
- Discuss and analyse factors influencing the need for change in educational organisation
- Discuss the role of faculty development in implementation of institutional change

#### SKILLS

- Discuss and reflect on the consequences of change for the main stakeholders in the change process

### TYPE OF INSTRUCTION

The teaching format is based on self-study, on-line lecturing, facilitating synchronous and asynchronous discussions and sharing of knowledge and experiences.

## EXAM

### EXAMS

|                 |                             |
|-----------------|-----------------------------|
| Name of exam    | Management of Change to PBL |
| Type of exam    | Written exam                |
| ECTS            | 5                           |
| Assessment      | 7-point grading scale       |
| Type of grading | Internal examination        |

## FACTS ABOUT THE MODULE

|                         |                            |
|-------------------------|----------------------------|
| Danish title            | Forandringsledelse til PBL |
| Module code             | TBIPBLK17302               |
| Module type             | Course                     |
| Duration                | 1 semester                 |
| Semester                | Autumn                     |
| ECTS                    | 5                          |
| Language of instruction | English                    |

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|                            |                                 |
|----------------------------|---------------------------------|
| Empty-place Scheme         | Yes                             |
| Location of the lecture    | Campus Aalborg                  |
| Responsible for the module | <a href="#">Mona Lisa Dahms</a> |

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# RESEARCH METHODS FOR EDUCATIONAL EVALUATION

**2018/2019**

## CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim of this course is to support the participants in developing skills in using research methods and instruments in engineering education, emphasizing educational evaluation for quality development.

After completion of this course you should have achieved knowledge and skills enabling you to:

### LEARNING OBJECTIVES

#### KNOWLEDGE

- Identify clear research objective(s) and formulate clear research questions in relation to objective(s)

#### SKILLS

- Discuss and compare quantitative and qualitative research methods and evaluate their relevance in relation to different types of research questions.
- Formulate a strategy for quality development within own institution

### TYPE OF INSTRUCTION

The teaching format is based on self-study, on-line lecturing, sharing of knowledge and experiences facilitating synchronous and asynchronous discussions, on-line workshops, seminars etc.

## EXAM

### EXAMS

|                 |   |
|-----------------|---|
| Name of exam    | Research Methods for Educational Evaluation |
| Type of exam    | Written or oral exam                        |
| ECTS            | 5   |
| Assessment      | Passed/Not Passed                           |
| Type of grading | Internal examination                        |

## FACTS ABOUT THE MODULE

|                         |   |
|-------------------------|---|
| Danish title            | Forskningsmetoder for uddannelsesevaluering |
| Module code             | TBIPBLK17303                                |
| Module type             | Course                                      |
| Duration                | 1 semester                                  |
| Semester                | Autumn                                      |
| ECTS                    | 5   |
| Language of instruction | English                                     |

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

|                            |                                 |
|----------------------------|---------------------------------|
| Empty-place Scheme         | Yes                             |
| Location of the lecture    | Campus Aalborg                  |
| Responsible for the module | <a href="#">Mona Lisa Dahms</a> |

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# MASTER'S THESIS

## 2018/2019

### CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The overall aim of this semester is to support the participants in fulfilling all MPBL programme learning outcomes, as given in section 2.5 of this curriculum, through the Master's thesis project.

Through this project you should achieve skills and competences enabling you to:

#### LEARNING OBJECTIVES

##### SKILLS

- Communicate project work results and processes of the project in a scientific way, both in writing and orally
- Reflect on your own learning process and development of teaching competences during the MPBL, as documented in your updated Teaching Portfolio.

##### COMPETENCES

- Critically analyse the MPBL programme learning outcomes in section 2.5 in this curriculum, with the aim of identifying missing gaps in learning outcomes, i.e. learning outcomes which you have not yet fully achieved
- Based on above, design and plan a final year project that aims to achieve missing programme learning outcomes

#### TYPE OF INSTRUCTION

The teaching format is mainly based on individual self-study and on-line study group discussions, combined with on-line facilitation and feedback.

### EXAM

#### EXAMS

|                 |                              |
|-----------------|------------------------------|
| Name of exam    | Master's Thesis              |
| Type of exam    | Oral exam based on a project |
| ECTS            | 15                           |
| Assessment      | 7-point grading scale        |
| Type of grading | External examination         |

### FACTS ABOUT THE MODULE

|                         |               |
|-------------------------|---------------|
| Danish title            | Masterprojekt |
| Module code             | TBIPBLK17401  |
| Module type             | Project       |
| Duration                | 1 semester    |
| Semester                | Spring        |
| ECTS                    | 15            |
| Language of instruction | English       |

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

|                            |                                 |
|----------------------------|---------------------------------|
| Empty-place Scheme         | Yes                             |
| Location of the lecture    | Campus Aalborg                  |
| Responsible for the module | <a href="#">Mona Lisa Dahms</a> |

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