AALBORG UNIVERSITET

STUDIEORDNING FOR MASTERUDDANNELSEN I PROBLEMBASERET LÆRING I INGENIØR OG NATURVIDENSKAB, 2019

MASTER
AALBORG

MODULER SOM INDGÅR I STUDIEORDNINGEN

INDHOLDSFORTEGNELSE

TEACHING PORTFOLIO

2021/2022

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim of this project is to support the participants in reflecting on own teaching practice and experiences and thereby develop their teaching competences, including educational planning and design. The teaching portfolio is a starting point for the participants to continuously reflect on and develop their teaching competences and will be updated by the end of the MPBL programme.

LEARNING OBJECTIVES

KNOWLEDGE

- Explain the purpose and contents of a typical teaching portfolio

SKILLS

- Analyse and discuss the use of active and social learning theories with the aim of developing own teaching practice
- Reflect on the relationship between learning theories and own teaching values and practice
- Reflect on the alignment of own teaching values, teaching practice and specific choice of pedagogical and educational principles and methods

COMPETENCES

- Analyse own teaching experiences based on knowledge of concepts, theories and methods presented in the course and argue for generalization of the experiences.
- Communicate the results of the above in a Teaching Portfolio, written in scientific language

TYPE OF INSTRUCTION

In the project the general knowledge from the courses in semester 1 is linked to experiences from own teaching practice. Participants have to prepare a personal Teaching Portfolio which should contain a self-critical reflection on and evaluation of own teaching values and teaching practice, seen in the light of the concepts, theories and methods presented in the courses. The Teaching Portfolio should be presented and communicated using scientific language.

The teaching format is an individual project, including self-study, online study group work, project facilitation and thematic online sessions. In this semester, the thematic sessions focus on how to fulfill the intended learning outcomes for the project and on the concept of a teaching portfolio.

EXAM

EXAMS

Name of exam	Teaching Portfolio
Type of exam	Written exam The project is assessed through a written, internal examination and marked according to the 7-point scale. The project assessment takes its point of departure in the written personal teaching portfolio. Both the content and the communicative aspects of the teaching portfolio will be assessed.
ECTS	5
Assessment	7-point grading scale

Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Undervisningsportfolio
Module code	TBIPBLM19101
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	Aida Olivia Pereira de Carvalho Guerra

ORGANISATION

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

LEARNING THEORIES AND CURRICULUM DEVELOPMENT

2021/2022

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim of this course is to support the participants in acquiring knowledge and skills about learning theories and curriculum development, in order to be able to analyze and reflect on the relationship to own teaching practice.

LEARNING OBJECTIVES

KNOWLEDGE

- Explain similarities and differences between a minimum of two different learning theories
- Explain the relationship between PBL learning principles and learning theories
- Explain similarities and differences between a minimum of two curriculum development models
- Explain in own words the principle of constructive alignment, including learning outcomes and assessment methods

SKILLS

- Discuss and analyse the relevance of PBL principles in relation to teaching methodologies applied in your own institution

TYPE OF INSTRUCTION

The course presents general learning theories, with focus on theories underpinning PBL. It also presents curriculum development models, thus demonstrating how the learning theories can be useful in educational design.

- Learning theories, including theories of active learning
- Theories of Collaborative learning and team work
- PBL principles
- Curriculum development models, including constructive alignment
- Learning outcomes and assessment

The teaching format is blended learning based on self-study of both written material and video clips, discussion in study groups and online seminars.

EXAM

EXAMS

Name of exam	Learning Theories and Curriculum Development
Type of exam	Written or oral exam
ECTS	5
Assessment	Passed/Not Passed
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Læringsteorier og undervisningsudvikling
Module code	TBIPBLM19102
Module type	Course
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	Aida Olivia Pereira de Carvalho Guerra

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COLLABORATIVE PROBLEM DESIGN

2021/2022

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim of this course is to support the participants in developing problem design skills in collaboration with peers. The first part of a problem-based project is problem design. The problem design frames the project, it is the focus of the collaborative team work and it has a strong impact on project documentation.

LEARNING OBJECTIVES

KNOWLEDGE

- List different understandings of a problem that can and has been used in the context of problem based, project organised learning
- Characterize the three phases of problem design: problem identification, problem analysis and problem formulation

SKILLS

- Co-design a problem based on a predefined theme, including the identification, analysis and formulation of a problem
- Document the problem design according to academic writing standards of the professional community
- Evaluate a collective problem design process

COMPETENCES

- Reflect on how problem design can be transferred to own teaching practice in order to facilitate students to use problem design in problem based projects
- Reflect on how problem design can influence the approach to own pedagogical development by identifying, analyzing and formulating concrete problems to foster improvement of own teaching practice

TYPE OF INSTRUCTION

This course focuses on the problem design process, supporting participants in handling this important first step of the PBL study process.

- Theoretical underlining of problems for problem based learning
- Problem design as a process of collaborative inquiry
- Appropriating scientific writing to problem design
- Exemplification of problem design processes
- Analyse problem design processes

The teaching format is blended learning based on self-study of both written material and video clips, discussion in study groups and online seminars.

EXAM

EXAMS

Name of exam	Collaborative Problem Design
Type of exam	Written or oral exam
ECTS	5
Assessment	Passed/Not Passed
Type of grading	Internal examination

Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Kollaborativ problemdesign
Module code	TBIPBLM19103
Module type	Course
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	Aida Olivia Pereira de Carvalho Guerra

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DESIGN AND PLANNING OF A PBL MODULE

2021/2022

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.

LEARNING OBJECTIVES

KNOWLEDGE

- Explain the core characteristics of a PBL module

SKILLS

- Plan, structure, carry out, and reflect upon a project that starts from a relevant problem within a specific teaching and institutional context
- 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

COMPETENCES

- Reflect upon the problem based learning principles embedded in the PBL module
- Cooperate with other team members during the project period and make a joint presentation of the results achieved in the project
- 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

This problem based project should include problem identification, problem analysis, problem formulation and proposed problem solution in the form of a design of and a plan for an educational experiment, including elements from one or more PBL models suited for solving the identified problem. The educational experiment should be adapted to a specific self-chosen teaching and/or institutional context.

The results of the project work should be documented in a project report. The project should preferably be carried out in teams of 2-4 participants and the project work processes should be documented in a process analysis, jointly written by the project team members.

The teaching format is a group project, including self-study, online group work, project facilitation and thematic online sessions. In this semester, the thematic sessions focus on how to fulfil the intended learning outcomes for the project and on scientific writing to improve the quality of documentation in the project reports.

EXAM

EXAMS

Name of exam	Design and Planning of a PBL Module
Type of exam	Oral exam based on a project The project assessment takes its point of departure in the written project report and the accompanying process analysis. Questions may be asked to all elements of the project, product as well as process. In the assessment both the content and the communicative aspects of the written work will be considered.

ECTS	10
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Design og planlægning af et PBL modul
Module code	TBIPBLM19201
Module type	Project
Duration	1 semester
Semester	Spring
ECTS	10
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Aalborg
Responsible for the module	Aida Olivia Pereira de Carvalho Guerra

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PBL MODELS, FACILITATION AND BLENDED LEARNING

2021/2022

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aims of this course are to support the participants in acquiring knowledge about how PBL learning principles are implemented in different PBL models, and to develop skills for facilitating students' collaborative, active and blended learning processes in PBL environments.

LEARNING OBJECTIVES

KNOWLEDGE

- Explain the applicability within your own institution of PBL models, taking into consideration the institutional framework
- Explain advantages of a minimum of three different teaching methods for blended learning suitable for PBL

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 at least two different teaching methods supporting PBL in your own teaching
- Analyse and reflect on the impact on students' learning of your use of teaching methods for active learning, including your role as facilitator

TYPE OF INSTRUCTION

The course deals with problem based learning, discussing historical background of PBL, learning principles, PBL models around the world and the teachers' role transition related to a shift from lecture based teaching to problem based learning. Tools for facilitation and teaching methods for blended learning is also included.

- Historical background of PBL
- Different PBL models
- Role transition from lecturer to facilitator
- Tools for effective facilitation
- Teaching methods for blended learning

The teaching format is blended learning based on self-study of both written material and video clips, discussion in study groups and online seminars.

EXAM

EXAMS

Name of exam	PBL Models, Facilitation and Blended Learning
Type of exam	Written or oral exam
ECTS	5
Assessment	Passed/Not Passed
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	PBL modeller, facilitering og blended læring
Module code	TBIPBLM19202
Module type	Course
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	Aida Olivia Pereira de Carvalho Guerra

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IMPLEMENTATION OF PBL

2021/2022

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim of the project is to support participants in developing competences to change educational practices to PBL, including evaluation of such change processes and their educational outcomes. Another aim is to support participants in achieving knowledge about theories of educational change management and quality assurance systems, in preparation for semester 4.

LEARNING OBJECTIVES

KNOWLEDGE

- Specify strategies for PBL implementation

SKILLS

- Carry out at least one educational experiment, where PBL is reframing educational practice
- Evaluate at least one educational experiment by use of a mixed method approach including both quantitative and qualitative methods

COMPETENCES

- Assess drivers and barriers for further institutionalisation of the implemented PBL change.
- Assess the contribution that the experiences from the PBL implementation can bring to other engineering education communities

TYPE OF INSTRUCTION

In this problem based project the participants will implement and evaluate an educational change in an institution of higher education, introducing elements of PBL. The implementation should include arguing for the choice of PBL elements. To the extent possible, the PBL activity to be implemented in the 3rd semester should be the PBL activity designed and planned during semester 2, thus securing the continuity and progress in the MPBL study.

Participants may choose to focus on a single case study or include several case studies, in order to compare how implementation of similar PBL activities turns out in different contexts.

The results of the project work should be documented in a project report, which should identify and document stages in the implementation process, including evaluation procedures and methods. The project should preferably be carried out in teams of 2-4 participants and the project work processes should be documented in a process analysis, jointly written by the project team members.

The teaching format is a group project, including self-study, online group work, project facilitation and thematic online sessions. In this semester, the thematic sessions focus on how to fulfil the intended learning outcomes for the project and on evaluation methods.

EXAM

EXAMS

Name of exam	Implementation of PBL
Type of exam	Oral exam based on a project

	The project assessment takes its point of departure in the written project report and the accompanying process analysis. Questions may be asked to all elements of the project, product as well as process. In the assessment both the content and the communicative aspects of the written work will be considered.
ECTS	10
Assessment	7-point grading scale
Type of grading	External examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Implementering af PBL
Module code	TBIPBLM19301
Module type	Project
Duration	1 semester
Semester	Autumn
ECTS	10
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Aalborg
Responsible for the module	Aida Olivia Pereira de Carvalho Guerra

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EDUCATIONAL EVALUATION AND MANAGEMENT OF CHANGE

2021/2022

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

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

LEARNING OBJECTIVES

KNOWLEDGE

- Explain qualitative, quantitative and mixed methods approaches to educational evaluation
- Describe quality assurance systems, relevant within the own educational institution
- Compare change management models

SKILLS

- Analyse and discuss factors influencing the need for change in educational organisations
- Discuss the role of faculty development in implementation of institutional change
- Reflect on and discuss the consequences of change for the main stakeholders in the change process

TYPE OF INSTRUCTION

The course discusses change processes in higher education institutions. Included are roles of different stakeholders, quality assurance aspects and methods for evaluation of educational change processes.

- Evaluation Methods
- Quality Assurance through Evaluation
- Faculty development and PBL implementation at system level
- Change models and change management theories
- Educational change and the role of university stakeholders.

The teaching format is blended learning based on self-study of both written material and video clips, discussion in study groups and online seminars.

EXAM

EXAMS

Name of exam	Educational Evaluation and Management of Change
Type of exam	Written or oral exam
ECTS	5
Assessment	Passed/Not Passed
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Uddannelsesevaluering og forandringsledelse

Module code	TBIPBLM19302
Module type	Course
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	Aida Olivia Pereira de Carvalho Guerra

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MASTER'S PROJECT - MANAGEMENT OF CHANGE AND CHANGE AGENCY

2021/2022

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

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

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

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.

LEARNING OBJECTIVES

KNOWLEDGE

- Present and argue for the relevance of different theories of change management in analysing the particular educational change processes

SKILLS

- Combine theories of change management to an analytical framework, which is aligned with the intentions indicated in the problem design
- Analyse pedagogical development policies and strategies of a specific institution, with the aim of identifying potentials and barriers for change to PBL
- Illustrate how pedagogical practices can impact institutional policies and strategies
- Discuss the dynamic relationship between top-down and bottom-up initiatives for educational change
- Communicate project work results and processes of the project in a scientific way, both in writing and orally

COMPETENCES

- Develop a strategy and action plan for institutional change to PBL in a self-chosen and specific institution
- Evaluate the potential of transferring experiences from the case to educational institutions in general
- Reflect on own learning process and development of teaching competences during the MPBL, and document this in an updated teaching portfolio

TYPE OF INSTRUCTION

In semester 4 the Master project is the only study activity. In this problem based project the participants will plan and design a change strategy and action plan for a higher education institution changing to PBL. The action plan should be detailed, identifying stages in the implementation process, including evaluation procedures and methods. The action plan should be comprehensive including considerations regarding educational practice as well as management at different levels.

In this semester, the participants have an opportunity to go in depth with a specific area of interest. It is also possible to perform interdisciplinary studies e.g. by joining a group with members with different academic backgrounds. Participants may choose to focus on a single case study or include several case studies, in order to compare how implementation of similar PBL activities turn out in different contexts.

The results of the project work should be documented in a project report. The project can be carried out individually or in teams of up to 3 participants. The project work processes should be documented in a process analysis.

The Master's thesis should include a summary in the mother tongue if not English. The summary should be at least 1 and at most 2 pages (not included in the possible fixed minimum and maximum number of pages per student). The summary is included in the overall evaluation of the project.

The teaching format is an individual or a group project, including self-study, online study group work, project facilitation and possibly thematic online sessions, adapted to the needs of participants.

EXAM

EXAMS

Name of exam	Master's Project - Management of Change and Change Agency
Type of exam	Oral exam based on a project The form of the assessment is an oral exam, taking its point of departure in the written Master's thesis and the updated teaching portfolio. In the assessment both the contents and the communicative aspects of the written and oral work will be considered.
ECTS	15
Assessment	7-point grading scale
Type of grading	External examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Masterprojekt - Forandringsledelse og forandringshandlen
Module code	TBIPBLM19401
Module type	Project
Duration	1 semester
Semester	Spring
ECTS	15
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Aalborg
Responsible for the module	Aida Olivia Pereira de Carvalho Guerra

ORGANISATION

Study Board	Studyboard for Techno-Anthropology and Sustainable Design
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