



AALBORG UNIVERSITET

# **CIVILINGENIØR, CAND.POLYT. I BIOTEKNOLOGI, 2017**

CIVILINGENIØR  
AALBORG

MODULER SOM INDGÅR I STUDIEORDNINGEN

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# EXPERIMENTAL MOLECULAR BIOLOGY

**2023/2024**

## CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

### LEARNING OBJECTIVES

#### KNOWLEDGE

Students who have passed the module should be able to

- Account for the central molecular biology
- Describe molecular biology techniques used in research and industry
- Account for transgenic techniques and design of relevant recombinant biotechnological products, including safety issues

#### SKILLS

- Apply molecular biology techniques used in research and industry
- Employ a comprehensive repertoire of bioinformatics analysis tools and databases
- Write a project report following the standards of the field of study, include relevant original scientific literature, use the correct terminology, and communicate the research-based foundation, problem and results of the project in writing, graphically and orally in a coherent way
- Assess and select relevant original scientific literature and current scientific methods, models and other tools used in the project and assess the problem of the project and results in relevant scientific contexts and social conditions

#### COMPETENCES

- Evaluate pros and cons of different production systems and organisms for biotechnological products
- Handle the planning, implementation and management of complex and unpredictable research and/or developmental tasks and take professional responsibility for implementing academic assignments and interdisciplinary collaborations
- Take responsibility for own professional development and specialization

#### TYPE OF INSTRUCTION

- Project work

#### EXTENT AND EXPECTED WORKLOAD

450 hours

## EXAM

### EXAMS

Name of exam	Experimental Molecular Biology
Type of exam	Oral exam based on a project
ECTS	15
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	Eksperimentel molekylærbiologi
Module code	K-BT-K1-47
Module type	Project
Duration	1 semester
Semester	Autumn
ECTS	15
Language of instruction	Danish and English
Empty-place Scheme	Yes
Location of the lecture	Campus Aalborg
Responsible for the module	<a href="#">Teis Søndergaard</a>

## ORGANISATION

Education owner	Master of Science (MSc) in Engineering (Biotechnology)
Study Board	Study Board of Chemistry and Bioscience
Department	Department of Chemistry and Bioscience
Faculty	The Faculty of Engineering and Science

# MOLECULAR BIOLOGY AND BIOINFORMATICS

**2023/2024**

## CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

### LEARNING OBJECTIVES

#### KNOWLEDGE

Students who have passed the module should be able to

- Account for the molecular mechanisms involved in the synthesis, structure and replication of DNA, transcription of genes, and translation of mRNA
- Account for the structure of prokaryotic and eukaryotic genomes
- Account for commonly used databases and use common search tools for retrieving data and linking data from public databases

#### SKILLS

- Evaluate the use of a variety of central molecular biology techniques
- Account for possibilities and limitations in sequence comparison algorithms and use these algorithms for the analysis of molecular evolution of genes and proteins
- Recite the principles behind advanced algorithms for data mining: e.g. Neural Networks, Hidden Markov Chains and Support Vector Machines
- Analyse simple data from microarray and sequence tag based gene expression analysis
- Produce a strategy for the physical cloning of a gene using information retrieved from databases

#### COMPETENCES

- Interpret the central dogma of molecular biology

#### TYPE OF INSTRUCTION

- Lectures and theoretical exercises

#### EXTENT AND EXPECTED WORKLOAD

150 hours

## EXAM

### EXAMS

Name of exam	Molecular Biology and Bioinformatics
Type of exam	Written or oral exam
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	Molekylærbiologi og bioinformatik
Module code	K-BT-K1-24
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	<a href="#">Teis Søndergaard</a>

## ORGANISATION

Study Board	Study Board of Chemistry and Bioscience
Department	Department of Chemistry and Bioscience
Faculty	The Faculty of Engineering and Science

# CELL BIOLOGY, IMMUNOLOGY AND GENETICS

**2023/2024**

## RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

The module builds on knowledge gained in Microbiology, Biochemistry

## CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim is to give the student a thorough insight in

- Eukaryotic cell biology and genetics and an overview of immunology
- Eukaryotic cell compartments, organelles, membranes and transport mechanisms
- Cytoskeleton, cell-cycle, and cell-division, mitosis and meiosis
- Signal transduction
- Mendel's laws
- Chromosomes and heredity
- Genotype, phenotype, and their correlation
- Genetic variability and diseases
- The composition and function of the immune system
- The role of the immune system in preventing and fighting, but also in causing disease
- Cell biologic, genetic, and immunologic methods

## LEARNING OBJECTIVES

### KNOWLEDGE

Students who have passed the module should be able to

- account for the composition of the eukaryotic cell
- account for the composition and function of the organelles of the eukaryotic cell
- describe inter and intra cellular communication
- account for the background for inheritance
- account for the theory on heredity and evolution
- account for and evaluate selected cell biologic, genetic, and immunologic methods and techniques
- account for central elements of the immune system
- account for the basic mechanisms of the immune system, including the potential pathologic developments

## TYPE OF INSTRUCTION

Lectures

Exercsises

## EXTENT AND EXPECTED WORKLOAD

150 hours

## EXAM

### EXAMS

Name of exam	Cell biology, Immunology and Genetics
Type of exam	Written or oral exam
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	Cellebiologi, immunologi og genetik
Module code	K-BT-K1-5
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	<a href="#">Anders Olsen</a>

## ORGANISATION

Study Board	Study Board of Chemistry and Bioscience
Department	Department of Chemistry and Bioscience
Faculty	The Faculty of Engineering and Science



# MICROBIAL DIVERSITY AND ACTIVITY

2023/2024

## CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

- The aim is to provide a fundamental understanding of how to characterize identity and function of prokaryotes using imaging and molecular techniques, how prokaryotes form consortia and biofilms, and how mixed microbial communities can be used to solve environmental challenges, such as production of bioenergy, reuse of resources, and production of clean water.
- Identification of microorganisms using molecular and bioinformatic approaches
- Use of advanced microscopy for characterization of microorganisms in mixed cultures
- Methods to determine activity of microorganisms directly in biofilm
- Biofilm formation, composition, microbial communication and microbial communities
- Pathogenic bacteria in biofilms
- Principles for control of unwanted prokaryotes
- Transformation of micropollutants
- Transformation of C, N and P in mixed communities
- Use of mixed communities to purify soil, water and air

## LEARNING OBJECTIVES

### KNOWLEDGE

Students who have passed the module should be able to

- Account for the formation, composition, growth and activity of mixed microbial communities
- Describe growth of human-related and pathogenic bacteria in biofilms
- Explain the use of mixed communities to clean soil, water and air for C, N and P
- Explain the use of mixed communities for nutrient recovery and bioenergy production

### SKILLS

- Apply bioinformatic databases and account for molecular techniques used for identification of microorganisms

### TYPE OF INSTRUCTION

- Lectures and theoretical exercises

### EXTENT AND EXPECTED WORKLOAD

150 hours

## EXAM

### EXAMS

Name of exam	Microbial Diversity and Activity
Type of exam	Written or oral exam
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	Mikrobiel diversitet og aktivitet
Module code	K-BT-K1-22
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	<a href="#">Nielsen</a>

## ORGANISATION

Study Board	Study Board of Chemistry and Bioscience
Department	Department of Chemistry and Bioscience
Faculty	The Faculty of Engineering and Science

# PROTEIN SCIENCE

**2023/2024**

## CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

### LEARNING OBJECTIVES

#### KNOWLEDGE

Students who have passed the module should be able to

- Account for how to design, produce, purify, and characterize proteins
- Describe how activity and stability of enzymes and other biotechnological relevant proteins can be determined
- Account for the development of new preparative and analytical methods in protein science

#### SKILLS

- Describe, model, and evaluate protein structures
- Compare and substantiate the choice of protein producing organisms for technical products
- Write a project report following the standards of the field of study, include relevant original scientific literature, use the correct terminology, and communicate the research-based foundation, problem and results of the project in writing, graphically and orally in a coherent way
- Assess and select relevant original scientific literature and current scientific methods, models and other tools used in the project and assess the problem of the project and results in relevant scientific contexts and social conditions

#### COMPETENCES

- Account for the scientific basis of selected preparative and analytical methods
- Compare and explain theoretical and practical results within the field of protein science
- Handle the planning, implementation and management of complex and unpredictable research and/or developmental tasks and take professional responsibility for implementing academic assignments and interdisciplinary collaborations
- Take responsibility for own professional development and specialization

#### TYPE OF INSTRUCTION

Project work

#### EXTENT AND EXPECTED WORKLOAD

450 hours

## EXAM

### EXAMS

Name of exam	Protein Science
Type of exam	Oral exam based on a project
ECTS	15
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	Proteinteknologi
Module code	K-BT-K2-38
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	<a href="#">Peter Kristensen</a>

## ORGANISATION

Education owner	Master of Science (MSc) in Engineering (Biotechnology)
Study Board	Study Board of Chemistry and Bioscience
Department	Department of Chemistry and Bioscience
Faculty	The Faculty of Engineering and Science

# PROTEIN CHEMISTRY

**2023/2024**

## CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

### LEARNING OBJECTIVES

#### KNOWLEDGE

Students who have passed the module should be able to

- Account for the chemistry and thermodynamics behind protein structure, folding, stability and function, including the effect of protein modifications
- Account for central elements of protein biosynthesis and processing
- Account for protein evolution and homology

#### SKILLS

- Design recombinant proteins and processes for their purification
- Explain, use and document the effect of different preparative and analytical methods, including different forms of chromatography and electrophoresis

#### COMPETENCES

- Read and understand advanced scientific articles in structural and analytical protein chemistry

### TYPE OF INSTRUCTION

- Lectures
- Theoretical exercises

### EXTENT AND EXPECTED WORKLOAD

150 hours

## EXAM

### EXAMS

Name of exam	Protein Chemistry
Type of exam	Written or oral exam
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	Proteinkemi
Module code	K-BT-K2-20

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	<a href="#">Peter Kristensen</a>

## ORGANISATION

Study Board	Study Board of Chemistry and Bioscience
Department	Department of Chemistry and Bioscience
Faculty	The Faculty of Engineering and Science

# PROTEIN STRUCTURE

**2023/2024**

## CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

### LEARNING OBJECTIVES

#### SKILLS

Students who have passed the module should be able to

- Predict and model protein structures from sequence data
- Give an account of state-of-the-art techniques for the investigation and determination of structure, including the procedures involved, prerequisites and the advantages and shortcomings of each of these techniques
- Extract and model biomolecular structural data from relevant databases
- Visualize structures and utilize structural data to explain biomolecular function
- Give an account of classification of protein structures

#### COMPETENCES

- Read and understand scientific articles on the determination, interpretation and application of biomolecular structures

#### TYPE OF INSTRUCTION

- Lectures
- Theoretical exercises

#### EXTENT AND EXPECTED WORKLOAD

150 hours

## EXAM

### EXAMS

Name of exam	Protein Structure
Type of exam	Written or oral exam
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	Proteinstruktur
Module code	K-BT-K2-21
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	<a href="#">Wimmer</a>

## ORGANISATION

Education owner	Master of Science (MSc) in Engineering (Biotechnology)
Study Board	Study Board of Chemistry and Bioscience
Department	Department of Chemistry and Bioscience
Faculty	The Faculty of Engineering and Science



# CARBOHYDRATE CHEMISTRY

**2023/2024**

## CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

### LEARNING OBJECTIVES

#### KNOWLEDGE

Students who have passed the module should be able to

- Explain and show in depth understanding of the structure and chemical properties of mono- and disaccharides as well as oligo- and polysaccharides
- Demonstrate knowledge of industrially important carbohydrates including hydrocolloids and their gelation properties
- Explain essential aspects of glycobiology
- Demonstrate in depth knowledge of the substrate specificity, regio- and anomeric selectivity as well as the function and catalytic mechanisms of carbohydrate active enzymes
- Demonstrate knowledge of the enzymology related to degradation and modification of plant based biomass including starch, cellulose and pectin

#### SKILLS

- Apply and suggest methods of carbohydrate synthesis and modifications to solve problems in industrial processes and applications
- Apply knowledge to evaluate structure in relation to functional properties of carbohydrates
- Carry out calculations on basic carbohydrate chemical concepts
- Perform theoretical analyses of chemical and physical methods in carbohydrate chemistry
- Suggest relevant chemical and enzyme catalysts for chemical reactions in carbohydrate chemistry

#### TYPE OF INSTRUCTION

- Lectures
- Theoretical exercises

#### EXTENT AND EXPECTED WORKLOAD

150 hours

### EXAM

#### EXAMS

Name of exam	Carbohydrate Chemistry
Type of exam	Written or oral exam
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	Kulhydratkemi
Module code	K-BT-K2-9
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	<a href="#">Pedersen,</a> <a href="#">Larsen</a>

## ORGANISATION

Study Board	Study Board of Chemistry and Bioscience
Department	Department of Chemistry and Bioscience
Faculty	The Faculty of Engineering and Science

# PROJECT-ORIENTED STUDY IN AN EXTERNAL ORGANISATION

**2023/2024**

## CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

### LEARNING OBJECTIVES

#### KNOWLEDGE

Students who have passed the module should be able to

- Explain the scientific basis of the work carried out by the external organisation

#### SKILLS

- Master the scientific methods and general skills related to the project work in the external organisation
- Write a report following the standards of the field of study, use the correct terminology and document extensive use of relevant and original scientific literature, and communicate and discuss the project's foundation, problem and results in writing, graphically and verbally in a coherent way
- Critically assess and select relevant original scientific literature and current scientific methods, models and other tools used in the project and assess and discuss the problem of the project and results in relevant scientific contexts and social conditions
- Evaluate the potential of the project for further development, assessing and incorporating relevant economic, ethical, environmental and other socially relevant factors

#### COMPETENCES

- Participate in development, innovation, and research and use scientific methods to solve complex tasks
- Take professional responsibility to implement independent assignments and interdisciplinary collaborations
- Independently take responsibility for own professional development and specialization

#### TYPE OF INSTRUCTION

- Project work, supervised by an external supervisor in collaboration with an internal supervisor at Aalborg University
- Project work in an external organisation must be in areas of relevance to the competence profile of the program

#### EXTENT AND EXPECTED WORKLOAD

900 hours

## EXAM

### EXAMS

Name of exam	Project-Oriented Study in an External Organisation
Type of exam	Oral exam based on a project
ECTS	30
Assessment	Passed/Not Passed
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	Projektorienteret forløb i en ekstern organisation
Module code	K-BT-K3-68
Module type	Project
Duration	1 semester
Semester	Autumn
ECTS	30
Language of instruction	Danish and English
Empty-place Scheme	Yes
Location of the lecture	Campus Aalborg
Responsible for the module	<a href="#">Wimmer</a>
Time allocation for external examiners	B

## ORGANISATION

Education owner	Master of Science (MSc) in Engineering (Biotechnology)
Study Board	Study Board of Chemistry and Bioscience
Department	Department of Chemistry and Bioscience
Faculty	The Faculty of Engineering and Science

# MASTER'S THESIS IN BIOTECHNOLOGY

## 2023/2024

### CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

#### LEARNING OBJECTIVES

##### KNOWLEDGE

Students who have passed the module should be able to

- Explain the scientific basis and scientific issues in biotechnology
- Explain the highest international research within the thesis subject area

##### SKILLS

- Master the scientific methods and general skills related to the thesis subject area
- Write a project report following the standards of the field of study, use the correct terminology and document extensive use of relevant and original scientific literature, and communicate and discuss the project's research-based foundation, problem and results in writing, graphically and verbally in a coherent way
- Critically assess and select relevant original scientific literature and current scientific methods, models and other tools used in the project and assess and discuss the problem of the project and results in relevant scientific contexts and social conditions
- Evaluate the potential of the project for further development, assessing and incorporating relevant economic, ethical, environmental and other socially relevant factors

##### COMPETENCES

- Participate in and independently implement technological and scientific development and research, develop and implement experimental work and solve complex tasks using scientific methods
- Handle the planning, implementation and management of complex and unpredictable research and/or developmental tasks and take professional responsibility to implement independent academic assignments and interdisciplinary collaborations
- Independently take responsibility for own professional development and specialization

#### TYPE OF INSTRUCTION

Project work

A long Master's thesis of more than 30 ECTS must include work of experimental nature to an extent that corresponds to the ECTS load of the thesis

#### EXTENT AND EXPECTED WORKLOAD

900 hours

### EXAM

#### EXAMS

Name of exam	Master's Thesis in Biotechnology
Type of exam	Master's thesis/final project
ECTS	30
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	Kandidatspeciale i bioteknologi
Module code	K-BT-K4-44
Module type	Project
Duration	1 semester
Semester	Spring
ECTS	30
Language of instruction	English
Location of the lecture	Campus Aalborg
Responsible for the module	<a href="#">Wimmer</a>

## ORGANISATION

Education owner	Master of Science (MSc) in Engineering (Biotechnology)
Study Board	Study Board of Chemistry and Bioscience
Department	Department of Chemistry and Bioscience
Faculty	The Faculty of Engineering and Science

# MASTER'S THESIS IN BIOTECHNOLOGY

## 2023/2024

### CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

#### LEARNING OBJECTIVES

##### KNOWLEDGE

Students who have passed the module should be able to

- Explain the scientific basis and scientific issues in biotechnology
- Explain the highest international research within the thesis subject area

##### SKILLS

- Master the scientific methods and general skills related to the thesis subject area
- Write a project report following the standards of the field of study, use the correct terminology and document extensive use of relevant and original scientific literature, and communicate and discuss the project's research-based foundation, problem and results in writing, graphically and verbally in a coherent way
- Critically assess and select relevant original scientific literature and current scientific methods, models and other tools used in the project and assess and discuss the problem of the project and results in relevant scientific contexts and social conditions
- Evaluate the potential of the project for further development, assessing and incorporating relevant economic, ethical, environmental and other socially relevant factors

##### COMPETENCES

- Participate in and independently implement technological and scientific development and research, develop and implement experimental work and solve complex tasks using scientific methods
- Handle the planning, implementation and management of complex and unpredictable research and/or developmental tasks and take professional responsibility to implement independent academic assignments and interdisciplinary collaborations
- Independently take responsibility for own professional development and specialization

##### TYPE OF INSTRUCTION

- Project work
- A long Master's thesis of more than 30 ECTS must include work of experimental nature to an extent that corresponds to the ECTS load of the thesis

##### EXTENT AND EXPECTED WORKLOAD

1800 hours

### EXAM

#### EXAMS

Name of exam	Master's Thesis in Biotechnology
Type of exam	Master's thesis/final project
ECTS	60
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	Kandidatspeciale i bioteknologi
Module code	K-BT-K4-45
Module type	Project
Duration	2 semesters
Semester	Spring
ECTS	60
Language of instruction	English
Location of the lecture	Campus Aalborg
Responsible for the module	<a href="#">Wimmer</a>

## ORGANISATION

Education owner	Master of Science (MSc) in Engineering (Biotechnology)
Study Board	Study Board of Chemistry and Bioscience
Department	Department of Chemistry and Bioscience
Faculty	The Faculty of Engineering and Science



# MEDICAL PROTEIN SCIENCE

**2023/2024**

## CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

### LEARNING OBJECTIVES

#### KNOWLEDGE

Students who have passed the module should be able to

- Account for how to design, produce, purify, and characterize proteins
- Describe how activity and stability of enzymes and medical relevant proteins, including antibodies, anti-microbial peptides, and other therapeutic proteins can be determined
- Account for the development of new preparative and analytical methods in protein science

#### SKILLS

- Describe, model, and evaluate protein structures
- Compare and substantiate the choice of protein producing organisms for medical products
- Write a project report following the standards of the field of study, include relevant original scientific literature, use the correct terminology, and communicate the research-based foundation, problem and results of the project in writing, graphically and orally in a coherent way
- Assess and select relevant original scientific literature and current scientific methods, models and other tools used in the project and assess the problem of the project and results in relevant scientific contexts and social conditions

#### COMPETENCES

- Account for the scientific basis of selected preparative and analytical methods
- Compare and explain theoretical and practical results within the field of protein science
- Handle the planning, implementation and management of complex and unpredictable research and/or developmental tasks and take professional responsibility for implementing academic assignments and interdisciplinary collaborations
- Take responsibility for own professional development and specialization

#### TYPE OF INSTRUCTION

Project work

#### EXTENT AND EXPECTED WORKLOAD

450 hours

## EXAM

### EXAMS

Name of exam	Medical Protein Science
Type of exam	Oral exam based on a project
ECTS	15
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
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## FACTS ABOUT THE MODULE

Danish title	Medicinsk Proteinteknologi
Module code	K-BT-K2-41
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	<a href="#">Peter Kristensen</a>
Time allocation for external examiners	B

## ORGANISATION

Education owner	Master of Science (MSc) in Engineering (Biotechnology)
Study Board	Study Board of Chemistry and Bioscience
Department	Department of Chemistry and Bioscience
Faculty	The Faculty of Engineering and Science

# MASTER'S THESIS IN MEDICAL BIOTECHNOLOGY

## 2023/2024

### CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

#### LEARNING OBJECTIVES

##### KNOWLEDGE

Students who have passed the module should be able to

- Explain the scientific basis and scientific issues in medical biotechnology
- Explain the highest international research within the thesis subject area

##### SKILLS

- Master the scientific methods and general skills related to the thesis subject area
- Write a project report following the standards of the field of study, use the correct terminology and document extensive use of relevant and original scientific literature, and communicate and discuss the project's research-based foundation, problem and results in writing, graphically and verbally in a coherent way
- Critically assess and select relevant original scientific literature and current scientific methods, models and other tools used in the project and assess and discuss the problem of the project and results in relevant scientific contexts and social conditions
- Evaluate the potential of the project for further development, assessing and incorporating relevant economic, ethical, environmental and other socially relevant factors

##### COMPETENCES

- Participate in and independently implement technological and scientific development and research, develop and implement experimental work and solve complex tasks using scientific methods
- Handle the planning, implementation and management of complex and unpredictable research and/or developmental tasks and take professional responsibility to implement independent academic assignments and interdisciplinary collaborations
- Independently take responsibility for own professional development and specialization

#### TYPE OF INSTRUCTION

Project work

A long Master's thesis of more than 30 ECTS must include work of experimental nature to an extent that corresponds to the ECTS load of the thesis

#### EXTENT AND EXPECTED WORKLOAD

900 hours

### EXAM

#### EXAMS

Name of exam	Master's Thesis in Medical Biotechnology
Type of exam	Master's thesis/final project
ECTS	30
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	Kandidatspeciale i medicinsk bioteknologi
Module code	K-BT-K4-46
Module type	Project
Duration	1 semester
Semester	Spring
ECTS	30
Language of instruction	English
Location of the lecture	Campus Aalborg
Responsible for the module	<a href="#">Wimmer</a>
Time allocation for external examiners	D

## ORGANISATION

Education owner	Master of Science (MSc) in Engineering (Biotechnology)
Study Board	Study Board of Chemistry and Bioscience
Department	Department of Chemistry and Bioscience
Faculty	The Faculty of Engineering and Science

# MASTER'S THESIS

## 2023/2024

### CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

#### LEARNING OBJECTIVES

##### KNOWLEDGE

Students who have passed the module should be able to

- Explain the scientific basis and scientific issues in medical biotechnology
- Explain the highest international research within the thesis subject area

##### SKILLS

- Master the scientific methods and general skills related to the thesis subject area
- Write a project report following the standards of the field of study, use the correct terminology and document extensive use of relevant and original scientific literature, and communicate and discuss the project's research-based foundation, problem and results in writing, graphically and verbally in a coherent way
- Critically assess and select relevant original scientific literature and current scientific methods, models and other tools used in the project and assess and discuss the problem of the project and results in relevant scientific contexts and social conditions
- Evaluate the potential of the project for further development, assessing and incorporating relevant economic, ethical, environmental and other socially relevant factors

##### COMPETENCES

- Participate in and independently implement technological and scientific development and research, develop and implement experimental work and solve complex tasks using scientific methods
- Handle the planning, implementation and management of complex and unpredictable research and/or developmental tasks and take professional responsibility to implement independent academic assignments and interdisciplinary collaborations
- Independently take responsibility for own professional development and specialization

#### TYPE OF INSTRUCTION

- Project work
- A long Master's thesis of more than 30 ECTS must include work of experimental nature and has to be approved by the study board. The amount of experimental work must reflect the allotted ECTS.

#### EXTENT AND EXPECTED WORKLOAD

1800 hours

### EXAM

#### EXAMS

Name of exam	Master's Thesis
Type of exam	Master's thesis/final project
ECTS	60
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	Kandidatspeciale
Module code	K-BT-K4-47
Module type	Project
Duration	2 semesters
Semester	Spring
ECTS	60
Language of instruction	English
Location of the lecture	Campus Aalborg
Responsible for the module	<a href="#">Wimmer</a>
Time allocation for external examiners	D

## ORGANISATION

Education owner	Master of Science (MSc) in Engineering (Biotechnology)
Study Board	Study Board of Chemistry and Bioscience
Department	Department of Chemistry and Bioscience
Faculty	The Faculty of Engineering and Science