August 2023, Study board of medicine

Semester description for 1st semester, Master of Science in Medicine with Industrial Specialisation, autumn 2023

Semester details
Study board of Medicine
Curriculum of Master in Science in Medicine with Industrial Specialisation

Semester framework theme
This should include an elaborated description in a prose form of the focus of the semester, activities implemented to fulfil the competence objectives and the thematic(s) of the semester. In other words, the semester description includes the "framework theme" that the students will be exposed to during the semester. The role of the semester and its contribution to students' academic progression should also be described.

The 1st semester of MedIS master's education is organized in 3 tracks: 1) Biomedicine (BM), 2) Translational Medicine (TM) and 3) Medical Market Access (MMA). Biomedicine focuses on the understanding of causes and treatment of disease at the molecular and cellular level. It builds upon the understanding of whole body functions. The students will learn how to perform hypothesis-driven experiments to understand human pathophysiology and to identify new targets for treatment. Therefore, a substantial part is devoted to experiments on cells or laboratory animals. Translational medicine is driven by the objective of improving clinical outcomes by efficiently moving results from basic science to clinical application. Medical Market Access is driven by the objective to improve market access of industry within the biotechnological, pharmaceutical, and medical devices markets.

Teaching is organized in research-based courses and projects. During the semester BM and TM have one profile-specific course and two common courses, one BM and TM, and one BM, TM, and MMA course. MMA profile has two profile-specific courses and one common course. The courses specific for each professional track have their own general focus: BM course focus on understanding disease pathophysiology at the cellular and molecular levels; TM course focuses on designing and evaluating pharmacological research; MMA courses focus on introduction to marketing and market access medical market and improvement of the markets for medical, pharmaceutical, and biotechnological equipment. The projects have focus on the methodological approach, which are unique for each of the three profiles. The projects will be supported by a course on problem-based project work.

Semester organisation and time schedule
This must be a short description the of the different activities of the semester, their mutual connections and the way in which they support each other and also support students in reaching their goals; such activities may be study trips, internship periods, project modules course modules, including laboratory activities, cooperation with external stakeholders, possible cross-disciplinary cooperation relations, any guest lectures and other events.

Each profile BM, TM, and MMA will take part in three 5 ECTS courses.

Each profile BM, TM, and MMA will as part of their practical projects (13.5 ECTS) take part in a project supporting course (1.5 ECTS) to ensure learning of all the learning objectives from the study regulation.

Semester coordinator and secretariat assistance
Names of anchorperson (teaching staff), course coordinator, semester coordinator (or similar title) and secretariat assistance provider(s).

Semester coordinator: Maj Schneider Thomsen, mst@hst.aau.dk, Department of Health, Science and Technology Department of Health, Science and Technology

Semester secretary: Dorthe Skree, dsk@hst.aau.dk

Student representative: Please check semester details on Moodle.

BM profile coordinator: Maj Schneider Thomsen, mst@hst.aau.dk, Department of Health, Science and Technology Department of Health, Science and Technology

TM profile coordinator: Kristian Kjær-Staal Petersen kkp@hst.auu.dk, Department of Health Science and Technology

MMA profile coordinator: Anita Egholm Jensen, aeje@dcm.aau.dk, Department of Clinical Medicine

Module description (description of each module)

Module title, ECTS credits (and possibly STADS code)
Quality improvement and quality assurance – BM/TM/MMA
5 ECTS

Location
Master of Science in Medicine with Industrial Specialisation, 1st semester
Study board for medicine

Module coordinator
The academic staff member responsible for the organisation and execution of the module.
The module leader may be the same person as the semester coordinator. If a person responsible for exam is pointed out, please state name and e-mail address here.

Søren Paaske Johnsen, spj@dcm.aau.dk; Department of Clinical Medicine

Type and language
Module type (e.g. study subject module, course module, project module etc.): Course module
Language of instruction: English

Objectives
Description of the content and objectives of the course as regards learning objectives of the students in the module. This comprises a transcript of the knowledge, skills and competences described in the study regulations and curriculum. Reference can be made to elaborations on semester Moodle site and/or to curriculum on Study Board website (applicable for MedIS and Medicine).

From Curriculum:

Knowledge
• Understand basic concepts and terminology in quality improvement, quality assurance and patient safety
• Explain the methods and theories used within quality and safety in healthcare
• Demonstrate knowledge of relevant law and regulations regarding quality and safety issues in healthcare
• Describe prerequisites for measuring quality and safety in healthcare
• Understand the relationship between quality and economics
• Demonstrate knowledge of medical, clinical and administrative databases
• Describe quality problems in healthcare
• Understand patients' rights and methods for patient involvement

Skills
• Identify and analyse quality problems in healthcare
• Conduct quality assurance procedures in GCP, GLP, GMP and GDP
• Suggest solutions for quality and safety issues in healthcare

Competences
• Contribute to development and evaluation of clinical quality improvement projects
• Evaluate data safety (e.g. GDPR) in research and practice

Academic content and conjunction with other modules/semesters
A brief and general description of the academic content of the module as well as the basis and motivation for the module; i.e. a brief review of the content and foundation of the module.
The intention is to provide students with an overview of each module and to create understanding of the module in relation to the semester and the entire programme.

The course aims to provide the students with a solid introduction to the theoretical and practical aspects of the quality and patient safety activities in the health sector, including both daily care and clinical research. The course contains review of the most recent quality nomenclature and definitions, relevant

legal aspects about quality and safety in the health sector, recent methods in quality supervision and improvement, like model for improvement, methods, and principles in avoiding unintended accidents, knowledge about the clinical quality databases, principles in involving patients and their families in the quality and safety work, as well as knowledge about relationship between quality and economy. In addition, key aspects of data safety, including the principles of GDPR, in relation to quality improvement, patient safety and clinical research will be addressed.

Scope and expected performance
The expected scope of the module in terms of ECTS load. This comprises number of teaching hours, exercises, preparation time, travel activity (if applicable) etc.

The course is 5 ECTS and the students can expect approx. 150 hours teaching including lectures/exercises, preparations, and exam. The course is offered as 8 sessions teaching consisting of lecture, discussion, and activating exercises that will train the students in the learning objectives. The 8 sessions are organised as 7 sessions that last 4 and a session that last for 2 hours. This gives 34 hours of teaching. The students are expected to prepare for each session by reading the course material posted on Moodle. This preparation is expected to last approximately 9 and a half hours per session, a total of 86 hours. The exam will take 2 hours and it is expected that students will need 18 hours of preparation prior to the exam. In total the students are expected to use 150 hours for this course.

Participants
Indication of the participants in the module, particularly if they include several year groups, programmes or another type of co-teaching.

MedIS master students MMA, BM, and TM profiles

Prerequisites for participation
Description of the prerequisites for students' participation in the course, i.e. previous modules/courses in other semesters etc. The overall intention is to emphasise the coherence of the programme. This may be a transcript of the text in the study regulations and curriculum.

Bachelor in MedIS or Medicine.

Module activities (course sessions etc.)

Level 1		
Activity - type and title	**Lecturer including department affiliation***	**Learning goals from curriculum**
Introducing quality improvement in health care (lecture/excercises, 4 hours)	Søren Paaske Johnsen Department of Clinical Medicine	• Understand basic concepts and terminology in quality improvement, quality assurance and patient safety • Describe quality problems in healthcare
Data sources in the health care system (lecture, 4 hours)	Søren Paaske Johnsen Department of Clinical Medicine	• Demonstrate knowledge of medical, clinical and administrative databases • Demonstrate knowledge of relevant law and regulations regarding quality and safety issues in healthcare (including GDPR).
Understanding management theory and the use of incentives in	Kjeld Møller Pedersen Department of Clinical Medicine	• Explain the methods and theories used within quality and safety in healthcare

the public health care sector (lecture/exercises, 4 hours)		• Demonstrate knowledge of about the association between quality of care, patient safety and health economics.
Patient and public involvement in health care improvement (lecture, 4 hours)	Søren Paaske Johnsen Department of Clinical Medicine	• Demonstrate knowledge of the possibilities and methods for involving patients and families in the development of quality and safety
Patient safety (lecture, 4 hours)	Jan Mainz Department of Clinical Medicine	• Demonstrate knowledge of healthcare law regulations on quality and safety, such as reporting adverse events • Demonstrate knowledge of major patient safety initiatives in Denmark and internationally.
Quality improvement in practice: How to do it? (lecture/exercises, 4 hours)	Søren Valgreen Knudsen Department of Clinical Medicine	• Describe quality problems in healthcare • Identify and analyse quality problems in healthcare • Suggest solutions for quality and safety issues in healthcare • Use the Model for Improvement for a specific issue in the health care system • Use the basic tools for statistical quality development, such as series charts and Pareto charts, for presentation and analysis of clinical indicator measurements • Contribute to planning, implementation and reporting of clinical quality development projects
Systematic quality assurance: from regulatory principles to daily practice (lecture/exercises, 4 hours)	Søren Paaske Johnsen Amalie Simoni Department of Clinical Medicine	• Understand the need for quality assurance procedures in clinical research, laboratory analyses, production of medical products, and handling of data • Conduct quality assurance procedures in GCP, GLP, GMP and GDP
Research in Quality Development and Patient Safety (lecture/exercise, 2 hours)	Søren Paaske Johnsen Department of Clinical Medicine	• Describe quality problems in healthcare • Identify and analyse quality problems in healthcare • Suggest solutions for quality and safety issues in healthcare • Exercises in course curriculum

** All rights reserved for changes during the semester due to e.g. illness, cancellations etc.*

Examination
The exam will be a two-hour written exam, carried out using Digital Exam (DE). The student is not allowed to bring any aids or, in any way, communicate with others. The exam will be graded as passed/not passed. With internal censorship.

For further information about examination, we refer to:
Digital Eksamen (DE)

Module title, ECTS credits (and possibly STADS code)
Profile: Biomedicine (BM)
Molecular Pathogenesis /Molekylær patogenese
5 ECTS course module

Location
Master of Science in Medicine with Industrial Specialisation, 1st semester
Study board for medicine

Module coordinator
The academic staff member responsible for the organisation and execution of the module.
The module leader may be the same person as the semester coordinator. If a person responsible for exam is pointed out, please state name and e-mail address here.

Annette Burkhart Larsen, abl@hst.aau.dk, Department of Health Science and Technology.

Type and language
Module type (e.g. study subject module, course module, project module etc.)
Language of instruction.

It is a course module and the course will be taught in English.

Objectives
Description of the content and objectives of the course as regards learning objectives of the students in the module. This comprises a transcript of the knowledge, skills and competences described in the study regulations and curriculum. Reference can be made to elaborations on semester Moodle site and/or to curriculum on Study Board website (applicable for MedIS and Medicine).

From Curriculum:

After attending this course, the student is expected to:

Knowledge
- Explain the molecular pathogenesis of common diseases
- Describe how disease processes can originate

Skills
- Obtain a deeper knowledge into the molecular pathogenesis of common diseases arising in man through relevant scientific literature, compared to that previously obtained through classical textbook material
- Find new hypothesis' of molecular pathogenesis in common diseases
- Work with scientific literature in-depth and get an insight into what qualifies as high-quality research
- Apply knowledge of molecular methods, and how these are used in scientific research to obtain new knowledge and hypothesis' of disease pathogenesis

Competences
- Synthesize a deeper knowledge about how common diseases arise and be able to suggest likely targets for therapy based on current research hypothesis within disease pathogenesis
- Be able to reflect critically on research literature
- Be able to facilitate a scientific discussion based on presentations and scientific literature
- Be able to find relevant scientific literature and present current and new hypothesis of molecular pathogenesis leading to disease progression

Academic content and conjunction with other modules/semesters

A brief and general description of the academic content of the module as well as the basis and motivation for the module; i.e. a brief review of the content and foundation of the module.
The intention is to provide students with an overview of each module and to create understanding of the module in relation to the semester and the entire programme.

Disease development in the whole human body will be scrutinized in this module. This will be based on the skills acquired during the bachelor MedIS education or similar bachelor education but at a higher level. Teaching will give an understanding of how disease processes can be utilized as targets for future drugs. The students will set up realistic research programs for investigating different hypotheses in the course of teaching. Moreover, there will be a focus on strengthening students' oral communication skills within research dissemination and ability to discuss disease processes in a bigger forum. The course additionally has a focus on the use of research literature instead of teaching books. This course will take the general disease understanding towards a research-level. There will therefore also be a focus on searching for research literature, reading articles, but also learning to be critical towards the research literature through a journal club session.

Scope and expected performance
The expected scope of the module in terms of ECTS load. This comprises number of teaching hours, exercises, preparation time, travel activity (if applicable) etc.

The course consists of 9 sessions throughout 7 weeks, which will be a combination of lectures and seminars. In general, each session contains a 90 min lecture from an invited speaker. The lecture will be based on the speakers own research within the topic of the week. Through the lectures, the students will learn more about disease development and potential targets for future drugs. Following the lecture, there will be a seminar, which is divided into three parts. In the first part, a group of students gives a presentation on the topic of the week, followed by discussion session facilitated by another group of students. Each session ends with a journal club arranged by a third group of students.
During the course, the students are expected to prepare a presentation and a written assignment based on articles the students have chosen themselves within the topic of the week. The students are expected to search the literature on the given topic and find relevant articles to include in their presentation. The main workload for the students is therefore in preparing for this presentation. The presentation will be followed by a discussion of the presented literature. This session is prepared by another set of students based on the literature provided by the presenting group and their written assignment.
Finally, during each session, an hour will be allocated to discussion of an article (journal club) within the session's topic, with the perspective of reaching a deeper understanding of the molecular pathogenesis, but also to learn the art of reading research articles and being critical towards presented results. This session will be prepared by a third group of students.

The expected workload of 150 hours for this 5 ECTS module are:
Actual teaching hours: 4 hours pr. session = 36 hours
General preparation for each session: 4 hour pr. session = 36 hours
Student presentation and writing an assignment (once during the module): 26 hours
Student discussion (once during the module): 6 hours
Journal club presentation (once during the module): 15 hours
Exam: 26 hours (presentation and assignment) and 5 hours (facilitation of discussion)

Participants
Indication of the participants in the module, particularly if they include several year groups, programmes or another type of co-teaching.

Obligatory course for MedIS students who have chosen the BM track.

Prerequisites for participation
Description of the prerequisites for students' participation in the course, i.e. previous modules/courses in other semesters etc. The overall intention is to emphasise the coherence of the programme. This may be a transcript of the text in the study regulations and curriculum.

Bachelor in MedIS, Medicine or similar education

Module activities (course sessions etc.)

The students must participate actively during the course and a prerequisite for enrolment for the exam requires active participation and approval of presentation during the course, meaning that each students should participate in the following three obligatory activities: 1) prepare and facilitate a presentation including a written assignment, 2) facilitate a discussion session, and 3) facilitate a journal club session

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Level 1

Activity - type and title	**Lecturer including department affiliation***	**Learning goals from curriculum**
Session 1: Introduction to the course and selection of topic Lecture, Topic selection, and Journal club seminar	Annette Burkhart Larsen, HST	• Work with scientific literature in-depth and get an insight into what qualifies as high-quality research. • Apply knowledge of molecular methods, and how these are used in scientific research to obtain new knowledge and hypotheses of disease pathogenesis • Be able to reflect critically on research literature. • Be able to facilitate a scientific discussion based on presentations and scientific literature.
Session 2: Workshop: Writing and reviewing scientific	Annette Burkhart Larsen, HST	• Work with scientific literature in-depth and get an insight into what qualifies as high-quality research. • Be able to reflect critically on research literature. • Be able to facilitate a scientific discussion based on presentations and scientific literature
Session 3: Immune Pathogenesis Lecture Seminar (Student presentation, Discussion and Journal club)	Tue Bjerg Bennike Emil Kofoed-Olsen, HST, Annette Burkhart Larsen, HST	• Explain the molecular pathogenesis of common diseases. • Describe how disease processes can originate. • Obtain a deeper knowledge into the molecular pathogenesis of common diseases arising in man through relevant scientific literature, compared to that previously obtained through classical textbook material. • Find new hypothesis' of molecular pathogenesis in common diseases • Work with scientific literature in-depth and get an insight into what qualifies as high-quality research. • Apply knowledge of molecular methods, and how these are used in scientific research to obtain new knowledge and hypotheses of disease pathogenesis.

		• Be able to facilitate a scientific discussion based on presentations and scientific literature. • Synthesize a deeper knowledge about how common diseases arise and be able to suggest likely targets for therapy based on current research hypothesis within disease pathogenesis. • Be able to reflect critically on research literature. • Be able to facilitate a scientific discussion based on presentations and scientific literature. Be able to find relevant scientific literature and present current and new hypothesis of molecular pathogenesis leading to disease progression
Session 4: Cancer pathogenesis Lecture Seminar (Student presentation, Discussion and Journal club)	Issa Ismal Issa, klinisk institut Annette Burkhart Larsen, HST	All learning outcomes from the curriculum, as also stated in session 3, will be addressed in this session
Session 5: CNS diseases, like CNS disease like Multiple Sclerosis, ALS and Parkinson Lecture Seminar (Student presentation, Discussion and Journal club)	John Nieland, HST Annette Burkhart Larsen, HST	All learning outcomes from the curriculum, as also stated in session 3, will be addressed in this session
Session 6: CNS Pathogenesis II: Psychological diseases Lecture Seminar (Student presentation, Discussion and Journal club)	Ove Wiborg, HST Annette Burkhart Larsen, HST	All learning outcomes from the curriculum, as also stated in session 3, will be addressed in this session
Session 7: Epigenetics in the pathology of diseases Lecture Seminar (Student presentation, Discussion and Journal club)	Jacek Lichota Annette Burkhart Larsen, HST	All learning outcomes from the curriculum, as also stated in session 3 will be addressed in this session
Session 8: Endocrinology and osteoporosis	Peter Vestergaard, KI	All learning outcomes from the curriculum, as also stated in session 3, will be addressed in this session

Lecture Seminar (Student presentation, Discussion and Journal Club)	Annette Burkhart Larsen, HST	
Session 9: Genetic disorders Lecture Seminar (Student presentation, Discussion and Journal club)	Annette Burkhart Larsen, HST	All learning outcomes from the curriculum, as also stated in session 3, will be addressed in this session

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Examination

Prerequisite for enrolment for the exam requires active participation and approval of presentation during the course, meaning that each student should participate in the following three obligatory activities: 1) prepare and facilitate a presentation including a written assignment, facilitate a discussion session, and facilitate a journal club session.

The exam will be an oral exam, where the students in groups give a presentation including uploading an assignment based on a freely chosen topic. The students will furthermore facilitate a discussion session based on another groups presentation, uploaded material and assignment. The exam will be a group exam where all students are present at once and are expected to listen to each other's presentations. The students are therefore also expected to be present during the entire exam.

Prior to the exam the students are expected to upload material in moodle related to their presentations, which will be used for facilitating the discussion session. Digital exam will not be used

Module coordinator and intern censor (Jacek Lichota, HST) will be present at the exam, which lasts 4 hours. All resources are available during the exam. The course will be graded Passed/Not Passed.

Module title, ECTS credits (and possibly STADS code)
Profile: Biomedicine (BM) and Translational Medicine (TM)
Molekylære og cellulære metoder i biomedicin / Molecular and Cellular Methods in Biomedicine
5 ECTS course module

Location
Master of Science in Medicine with Industrial Specialisation, 1st semester
Study board for medicine

Module coordinator
The academic staff member responsible for the organisation and execution of the module.
The module leader may be the same person as the semester coordinator. If a person responsible for exam is pointed out, please state name and e-mail address here.

Cristian Pablo Pennisi, cpennisi@hst.aau.dk, Department of Health, Science and Technology.

Type and language
Module type (e.g. study subject module, course module, project module etc.)
Language of instruction.

It is a course module and the course will be taught in English.

Objectives
Description of the content and objectives of the course as regards learning objectives of the students in the module. This comprises a transcript of the knowledge, skills and competences described in the study regulations and curriculum. Reference can be made to elaborations on semester Moodle site and/or to curriculum on Study Board website (applicable for MedIS and Medicine).

From Curriculum:

Students who complete this module will be able to:

Knowledge
- Describe the terminology, concepts and theories in molecular and cellular biology associated to the methods discussed in the module, both under normal conditions and in disease
- Identify the key technologies and methods used in a biomedical laboratory and recognise their advantages and limitations
- Understand the principles behind the different methods and the type of data generated
- Identify the current challenges and perspectives in cell and molecular-based assays

Skills
- Investigate and critically assess the methodological aspects from scientific literature
- Devise experimental workflows that incorporate the relevant controls, following quality control guidelines when appropriate
- Analyse experimental data qualitatively and quantitatively and interpret the results

Competences
- Apply the theory to design experimental protocols and identify the appropriate sources of materials
- Select the most appropriate methods to answer a biomedical and/or translational research question
- Integrate the obtained knowledge and skills within new areas to design and plan advanced tasks and projects

Academic content and conjunction with other modules/semesters
A brief and general description of the academic content of the module as well as the basis and motivation for the module; i.e. a brief review of the content and foundation of the module.
The intention is to provide students with an overview of each module and to create understanding of the module in relation to the semester and the entire programme.

The goal of this module is to introduce students to modern methods used in a biomedical laboratory to investigate and diagnose disease processes, with a focus on methods used to study the diseases at molecular and cellular levels. The topics include methods for advanced biochemical and molecular-biological studies, such as real-time RT-PCR, western blotting, ELISA, fluorescence imaging, widefield and confocal microscopy, flow cytometry, histology, and mass spectrometry. The students are expected to understand the principles behind the different diagnostic methods, using the theories in molecular and cellular biology learned during the bachelor education.
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Scope and expected performance
The expected scope of the module in terms of ECTS load. This comprises number of teaching hours, exercises, preparation time, travel activity (if applicable) etc.

Teaching method	Confrontation Sessions with teacher / supervisor	Obligatory elements	Preparation Students (sessions)	In total (ECTS)
Lectures and problem solving	14 x 4 = 56 lessons (1,87 ECTS)		14 x 1,5 = 21 lessons (0,7 ECTS)	2,57
Final assignment workshop	2 x 4 = 8 lessons (0,27 ECTS)	yes		0,27
Final assignment		yes	30 h (1 ECTS)	1,00
Preparation for the exam			35 h (1,16 ECTS)	1,16
Total				5,00

The course is typically planned in sessions of 4 hours (two sessions per week) during 7 weeks. Students are expected to prepare for each session by reading the materials available in Moodle. A general lecture on the topic is given during the first hour. Then, students have 2 hours to solve an assignment, which typically consists of a set of questions or practical exercises. During these 2 hours, the teacher is usually available (on site or online) to help students with questions. In the last hour there is a summary discussion in plenary session. Some sessions in the course will be provided as double lectures (2 hours) and the discussions will be addressed in the following session (2 hours).

Participants
Indication of the participants in the module, particularly if they include several year groups, programmes or another type of co-teaching.

1st semester students of the Master of Science in Medicine with Industrial Specialisation, both BM and TM profiles.

Prerequisites for participation
Description of the prerequisites for students' participation in the course, i.e. previous modules/courses in other semesters etc. The overall intention is to emphasise the coherence of the programme. This may be a transcript of the text in the study regulations and curriculum.

There is no explicit prerequisite in the curriculum. However, it is expected that the students possess a background on biochemistry and molecular biology of the cell (for example, module "Advanced Biochemistry and genetics" of the AAU MedIS bachelor programme or equivalent).

Module activities (course sessions etc.)

Activity - type and title	Planned instructor*	Learning goals from curriculum
Session 1: Introduction. Quantitative and qualitative analysis tools	Cristian Pablo Pennisi (HST)	• Describe the terminology, concepts and theories in molecular and cellular biology associated to the methods discussed in the module, both under normal conditions and in disease • Identify the key technologies and methods used in a biomedical laboratory and recognise their advantages and limitations • Identify the current challenges and perspectives in cell and molecular-based assays
Sessions 2 and 3: Microscopy and Digital image processing	Vladimir Zachar (HST)	• Understand the principles behind the different methods and the type of data generated • Select the most appropriate methods to answer a biomedical and/or translational research question
Session 4: Methods in cell electrophysiology	Cristian Pablo Pennisi (HST)	• Understand the principles behind the different methods and the type of data generated • Select the most appropriate methods to answer a biomedical and/or translational research question
Sessions 5 & 6: Immunological methods	Ralf Agger (HST)	• Understand the principles behind the different methods and the type of data generated • Select the most appropriate methods to answer a biomedical and/or translational research question
Session 7: Analysis of flow cytometry data	Qiuyue Peng (HST)	• Understand the principles behind the different methods and the type of data generated • Select the most appropriate methods to answer a biomedical and/or translational research question
Session 8: Bioreactors for mammalian cells	Trine Fink (HST)	• Understand the principles behind the different methods and the type of data generated • Select the most appropriate methods to answer a biomedical and/or translational research question
Sessions 9 & 10: Histochemistry and Immunohistochemistry	Cristian Pablo Pennisi (HST)	• Understand the principles behind the different methods and the type of data generated • Select the most appropriate methods to answer a biomedical and/or translational research question
Session 11: Mass spectrometric methods	Allan Stensballe (HST)	• Understand the principles behind the different methods and the type of data generated • Select the most appropriate methods to answer a biomedical and/or translational research question
Session 12: qPCR	Simone Riis / Maj Schneider Thomsen (HST)	• Understand the principles behind the different methods and the type of data generated • Select the most appropriate methods to answer a biomedical and/or translational research question
Session 13: Molecular microbiology	Svend Birkelund (HST)	• Understand the principles behind the different methods and the type of data generated

		• Select the most appropriate methods to answer a biomedical and/or translational research question
Session 14: Assisted reproductive techniques	Hiva Alipour (HST)	• Understand the principles behind the different methods and the type of data generated • Select the most appropriate methods to answer a biomedical and/or translational research question
Assignments	The lecturer in charge of the corresponding lecture	• Investigate and critically assess the methodological aspects from scientific literature • Analyse experimental data qualitatively and quantitatively and interpret the results
-Group assignment workshop (online) -Oral presentation of the group assignment (obligatory)	Cristian Pablo Pennisi (HST)	• Devise experimental workflows that incorporate the relevant controls, following quality control guidelines when appropriate • Select the most appropriate methods to answer a biomedical and/or translational research question • Integrate the obtained knowledge and skills within new areas to design and plan advanced tasks and projects

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Examination

1. The pre-requisite for participation in the final exam is approval of the written group assignment and participation in the presentation workshop.
2. Written exam (internal assessment by 7-point grading scale).
3. The written exam is based on the assignments solved during the course. The exam allows for an individual assessment of the student's ability to explain, critically assess, and select the different methods studied in the course.
4. The module coordinator is present during the first 30 minutes of the exam to help with interpretation issues students may have.
5. The final exam is delivered through the Digital Exam platform. Re-examination may be implemented as an oral exam, depending on the number of students. In case of an oral re-exam, students will be given the assignment and have 20 min. preparation time before the examination.
6. Duration is 2 hours
7. Aids are not allowed.

For further information, we refer to webpages concerning examination

- Digital Eksamen (DE)

Module title, ECTS credits (and possibly STADS code)
Profile: Translational Medicine (TM)
Design og evaluering af farmakologisk forskning/Designing and evaluating pharmacological research
5 ECTS

Location
Master of Science in Medicine with Industrial Specialisation, 1st semester
Study board for medicine

Module coordinator
The academic staff member responsible for the organisation and execution of the module.
The module leader may be the same person as the semester coordinator. If a person responsible for exam is pointed out, please state name and e-mail address here.

Anne Estrup Olesen, aneso@dcm.aau.dk, Department of Clinical Medicine

Type and language
Course module
Language of instruction.

English. All written materials will be in English. In case all students and lecturer are speaking Danish, lectures and discussions may be carried out in Danish.

Objectives
From Curriculum:

Learning objectives
- Students who complete this module are expected to be able to:

Knowledge
- Describe the different phases of pharmacological research from drug development to clinical application.
- Define different study designs in evaluation of pharmacological effects.
- Identify scientific problems and challenges in pharmacological research
- Knowledge on placebo effects and the impact on clinical application
- Describe different tools for evaluation of clinical trials
- Explain the contribution of pharmacological research in relation to evidence-based medicine

Skills
- Able to discuss advantages and limitations of different study designs for evaluation of pharmacological effects.
- Use different tools to evaluate clinical trials
- Select appropriate study designs to answer specific research questions on pharmacological effect.

Competences
- Critically appraise and relate to pharmacological research
- To read a scientific publication on pharmacological effects, present main findings, discuss and evaluate study design, data collection, analysis, findings, and the major limitations.
- Formulate a research proposal to identify mechanisms of action or potential side-effects of new drugs for a certain disorder or condition.

Academic content and conjunction with other modules/semesters

Pharmacology is a research discipline in which a set of principles and methods are applied to study mode of action of drugs in biological systems. The goal of this course is to expose students to a variety of relevant topics in basic and clinical pharmacological research. Current topics and evidence within a number of different areas in pharmacology will be presented and discussed. Using pharmacology as an example, different study designs will be presented including e.g. animal studies, randomized controlled trials and pharmacoepidemiological studies followed by group discussions and knowledge dissemination through PBL exercises.

Scope and expected performance
The expected scope of the module in terms of ECTS load. This comprises number of teaching hours, exercises, preparation time, travel activity (if applicable) etc.

5 ECTS course (150 hours):

Lectures: 13 lectures x 2 hours = 26 hours
Exercises: 26 hours (each lecture will include/be followed by an exercise)
Preparation to lectures: 40 hours
Preparation of written assignment and oral presentation for exam: 50 hours

- It is expected that students work in groups on the written assignment during the module
- It is expected that the students prepare for the exam/"mini-conference" by preparing own group presentation and reviewing projects from other groups on which they will act as opponents for the exam. Thus, part of the 50 hours is allocated to this work.

Q&A session: 2 hours
Exam (mini-conference): 6 hours (all students attend the 6 hours mini-conference)

Participants
Indication of the participants in the module, particularly if they include several year groups, programmes or another type of co-teaching.
MedIS students with a bachelor degree or other relevant bachelor degrees with basic knowledge in pharmacology.

Prerequisites for participation
Description of the prerequisites for students' participation in the course, i.e. previous modules/courses in other semesters etc. The overall intention is to emphasise the coherence of the programme. This may be a transcript of the text in the study regulations and curriculum.

It is expected that the participants have passed a basic pharmacology course and are familiar with principles of pharmacology and pharmacotherapy of diseases and disorders in general.

Module activities (course sessions etc.)

Lectures: 90 min (2x45 min) presentation by lecturer with theory and case presentations

Exercises: 90 min (2x45 min) where the students work in small groups on different thematic assignments provided by the individual lecturers.

Project: During the module the students will work in groups on a project "research proposal for the evaluation of a pharmacological agent".

Exam will be held as a ”mini-conference”: 240 min (6x45 min). The students will present and discuss their project and receive group-based feed-back and questions from peers and at least two lecturers (including module coordinator).

Course modules:

Level 1		
Activity - type and title	Lecturer including department affiliation*	Learning goals from curriculum
Lecture 1. Introduction to the course – assignment information & learning outcomes of the course	Anne Estrup Olesen, Department of Clinical Medicine	• Critically appraise and relate to pharmacological research • To read a scientific publication on pharmacological effects, present main findings, discuss and evaluate study design, data collection, analysis, findings, and the major limitations. • Formulate a research proposal to identify mechanisms of action or potential side-effects of new drugs for a certain disorder or condition
Lecture 2. Research in Pharmacology from basic to clinic: role of PK I	Anne Estrup Olesen, Department of Clinical Medicine	• Identify scientific problems and challenges in pharmacological research • Able to discuss advantages and limitations of different study designs for evaluation of pharmacological effects. • Critically appraise and relate to pharmacological research
Lecture 3. Research in Pharmacology from basic to clinic: role of PK II	Anne Estrup Olesen, Department of Clinical Medicine	• Identify scientific problems and challenges in pharmacological research • Able to discuss advantages and limitations of different study designs for evaluation of pharmacological effects. • Critically appraise and relate to pharmacological research
Lecture 4 (incl. journalclub). The blood-brain-barrier and RNA therapy in pharmacological research	Annette Burkhart Larsen, Department of Health Science and Technology Anja Holm, Center for RNA medicine, Department of Health Science and Technology	• Describe the different phases of pharmaco-logical research from drug development to clinical application.

Lecture 5. Drug discovery part I	John Dirk Nieland, Department of Health Science and Technology	• Describe the different phases of pharmacological research from drug development to clinical application. • Define different study designs in evaluation of pharmacological effects.
Lecture 6. Drug discovery part II	John Dirk Nieland, Department of Health Science and Technology	• Describe the different phases of pharmacological research from drug development to clinical application. • Define different study designs in evaluation of pharmacological effects.
Lecture 7. Clinical trial designs – what do you want to test?	Dennis Boye Larsen, Department of Health Science and Technology	• Define different study designs in evaluation of pharmacological effects. • Identify scientific problems and challenges in pharmacological research • Able to discuss advantages and limitations of different study de-signs for evaluation of pharma-cological effects. • Select appropriate study designs to answer specific research questions on pharmacological effect.
Lecture 8. Clinical trials – Phase I & II studies	Dennis Boye Larsen, Department of Health Science and Technology	• Describe the different phases of pharmacological research from drug development to clinical application. • Able to discuss advantages and limitations of different study designs for evaluation of pharmacological effects • Critically appraise and relate to pharmacological research • To read a scientific publication on pharmacological effects, present main findings, discuss and evaluate study design, data collection, analysis, findings, and the major limitations.
Lecture 9. Clinical trials – Phase II & III studies	Dennis Boye Larsen, Department of Health Science and Technology Anne Estrup Olesen, Department of Clinical Medicine	• Describe the different phases of pharmacological research from drug development to clinical application. • Able to discuss advantages and limitations of different study designs for evaluation of pharmacological effects • Critically appraise and relate to pharmacological research • To read a scientific publication on pharmacological effects, present main findings, discuss and evaluate study

		design, data collection, analysis, findings, and the major limitations.
Lecture 10. Placebo effects – how does it affect the development and implementation of new pharmaceutical agents in the clinic?	Laura Petrini, Department of Health Science and Technology	• Identify scientific problems and challenges in pharmacological research • Knowledge on placebo effects and the impact on clinical application • Able to discuss advantages and limitations of different study designs for evaluation of pharmacological effects.
Lecture 11. Evidence-based medicine and pharmacological research. The evaluation of clinical trials – how do we ensure the quality of the available evidence?	Anne Estrup Olesen, Department of Clinical Medicine	• Describe different tools for evaluation of clinical trials • Identify scientific problems and challenges in pharmacological research • Explain the contribution of pharmacological research in relation to evidence-based medicine • Use different tools to evaluate clinical trials • Critically appraise and relate to pharmacological research
Lecture 12. Pharmacoepidemiology part I	Peter Brønnum Nielsen, Department of Clinical Medicine	• Describe the different phases of pharmacological research from drug development to clinical application. • Identify scientific problems and challenges in pharmacological research • Able to discuss advantages and limitations of different study designs for evaluation of pharmacological effects. • Select appropriate study designs to answer specific research questions on pharmacological effect.
Lecture 13. Pharmacoepidemiology part II	Peter Brønnum Nielsen, Department of Clinical Medicine	• Describe the different phases of pharmacological research from drug development to clinical application. • Identify scientific problems and challenges in pharmacological research • Able to discuss advantages and limitations of different study designs for evaluation of pharmacological effects. • Select appropriate study designs to answer specific research questions on pharmacological effect.
Q&A for mini-conference (14)		• Questions on the expected criteria for passing the exam workshop

Summary of module and questions related to the exam.	Anne Estrup Olesen, Department of Clinical Medicine	
Exam/mini-conference(15) – full day	Peter Brønnum Nielsen, Department of Clinical Medicine Anne Estrup Olesen, Department of Clinical Medicine	• Examination

** All rights reserved for changes during the semester due to e.g. illness, cancellations etc.*

Examination

- Exam form: The exam will include 4 parts: a) the written project proposal (made in groups), b) oral presentation by the group of the project proposal, 3) one group will act as oral opponent on another project and 4) participation in the full workshop.
- A short description on how the exam form is connected to the learning objectives and teaching activities: This exam form will elucidate if student acquired all the achieved skills and competences.
- Who will participate at the exam: Module coordinator and at least one other lecturer (internal examiner AAU) will participate in the exam. All students will participate in all examinations (the full ”mini-conference”).
- The practical holding of the exam/mini-conference”:
    a. A written project proposal should be made in groups and submitted in due time before the exam.
    b. Each group will give an oral presentation at the examination.
    c. Each group will act as opponents on another project proposal
    d. Each group will receive feed-back from examiners (only on a group-based level, not individual)

- Duration of the exam: a full day (6x45 min) will be allocated for the ”mini-conference”
  The course will be evaluated as passed/not passed

Module title, ECTS credits (and possibly STADS code)
Profile: Medical Market access (MMA)
Methods of Economic Evaluation in Healthcare
Metoder til økonomisk evaluering i sundhedsvæsenet
5 ECTS course module

Location
Master of Science in Medicine with Industrial Specialisation, 1st semester
Study board for medicine

Module coordinator
The academic staff member responsible for the organisation and execution of the module.
The module leader may be the same person as the semester coordinator. If a person responsible for exam is pointed out, please state name and e-mail address here.

Sabrina Storgaard Sørensen, ssso@dcm.aau.dk, Department of Clinical Medicine

Type and language
Module type (e.g. study subject module, course module, project module etc.)
Language of instruction.

It is a course module and the course will be taught in English.

Objectives
Description of the content and objectives of the course as regards learning objectives of the students in the module. This comprises a transcript of the knowledge, skills and competences described in the study regulations and curriculum. Reference can be made to elaborations on semester Moodle site and/or to curriculum on Study Board website (applicable for MedIS and Medicine).

From Curriculum:

After attending this course, the student is expected to:

KNOWLEDGE
- Demonstrate knowledge of normative and positive health economics
- Understand the different methods for economic evaluation and economic analysis in health care and their application
- Demonstrate knowledge of health technology assessment
- Understanding of costs, including the difference between expenses and disbursements, as well as fixed, variable,direct costs, overhead costs and productivity loss
- Understanding outcome measures applied in health economic evaluations, including both patient-reported outcomes and monetary valuation of health outcomes
- Demonstrate knowledge of Quality-Adjusted Life Years and understanding of applications and limitations in health care decision-making
- Demonstrate knowledge of prioritisation in health care systems and understanding of the associated ethical dilemmas

SKILLS
- Produce a simple economic evaluation of a new health care intervention
- Produce a deterministic sensitivity analysis (e.g. one-way, two-way, scenario analysis)

COMPETENCES
- Differentiate between normative and positive health economics
- Assess whether new health care interventions represent “good value for money”
- Critically assess the appropriateness of pre-developed questionnaires

- Critically assess the methodological quality of existing economic evaluations and interpret the validity and transferability of the results

Academic content and conjunction with other modules/semesters
A brief and general description of the academic content of the module as well as the basis and motivation for the module; i.e. a brief review of the content and foundation of the module.
The intention is to provide students with an overview of each module and to create understanding of the module in relation to the semester and the entire programme.

The point of departure for this course is asking; can you put a price on health? Scarce resources in the public health care sector mean that decisions must be made regarding which interventions (drugs, medical devices, medical technologies, etc) to reimburse and to which to deny.

The course gives a basic introduction to health economics and has a special focus on economic evaluation (e.g. cost-effectiveness analysis). The aim is to give students an understanding of why and how decisions in the health care system are made when costs are borne solely, or in part, by one part, but the effects accrue to another part. The course will provide students with a theoretical, methodological, and practical toolkit to support decision-making in the health care system.

This course is a basic course in health economics, which builds on elements first presented in the course Pharmacology in pre-clinical & economic perspectives from the bachelor in Medicine with Industrial Specialization, and ties together with the course in Organisation and Financing in the second semester of the Master's programme. Moreover, the course is a precursor for the course in Decision-Analytical Modelling and Trial-Based Evaluations in Health Economics in the second semester of the Master's Programme in Medical Market Access.

Scope and expected performance
The expected scope of the module in terms of ECTS load. This comprises number of teaching hours, exercises, preparation time, travel activity (if applicable) etc.

The course is 5 ECTS and the students can expect approximately 150 hours of teaching including lectures/exercises, preparations, and exams. The course is offered as 8 sessions of 4-6 hours consisting of lectures and exercises.

Lectures: 7 lectures x 4-6 hours = 30 hours
Exercises: 1 session x 4 hours = 4 hours
Preparation for the lectures: 8 sessions x 10,75 h = 86 hours
Preparation for the exam: 28 hours
Exam: 2 hours

Total: 150 hours

Participants
Indication of the participants in the module, particularly if they include several year groups, programmes or another type of co-teaching.

The course is part of the Master's programme in Medical Market Access

Prerequisites for participation
Description of the prerequisites for students' participation in the course, i.e. previous modules/courses in other semesters etc. The overall intention is to emphasise the coherence of the programme. This may be a transcript of the text in the study regulations and curriculum.

The course builds on elements from module 5.4 (Pharmacology in pre-clinical& economic perspectives) from the bachelor in Medicine with Industrial Specialization, but this is not a requirement.

Module activities (course sessions etc.)

Activity - type and title	**Lecturer including department affiliation***	**Learning goals from curriculum**
Introduction to health economics (lecture, 4 hours)	**Flemming W. Udsen,** Department of Health Science & Technology	Demonstrate knowledge of normative and positive health economics Understand the different methods for economic evaluation and economic analysis in health care and their application Demonstrate knowledge of prioritisation in health care systems and understanding of the associated ethical dilemmas Differentiate between normative and positive health economics
Understanding costs and cost analysis – introduction (lecture, exercises, 4 hours)	Sabrina Storgaard Sørensen, Department of Clinical Medicine	Understanding of costs, including the difference between expenses and disbursements, as well as fixed, variable, direct costs, overhead costs and productivity loss
Understanding costs and cost analysis – continued (lecture, exercises, 4 hours)	Sabrina Storgaard Sørensen, Department of Clinical Medicine	Understanding of costs, including the difference between expenses and disbursements, as well as fixed, variable, direct costs, overhead costs and productivity loss
Measuring and valuing health effects (lecture, exercises, 4 hours)	Allan Riis, Department of Clinical Medicine	Understanding outcome measures applied in health economic evaluations, including both patient-reported outcomes and monetary valuation of health outcomes Demonstrate knowledge of Quality-Adjusted Life Years and understanding of applications and limitations in health care decision-making
Measuring and valuing health effects - continued (lecture, exercises, 4 hours)	Nasrin Tayyari Dehbarez, Department of Clinical Medicine	Understanding outcome measures applied in health economic evaluations, including both patient-reported outcomes and monetary valuation of health outcomes Demonstrate knowledge of health technology assessment Critically assess the appropriateness of pre-developed questionnaires
Economic evaluation (lecture, 4 hours)	Nasrin Tayyari Dehbarez Department of Clinical Medicine	Understand the different methods for economic evaluation and economic analysis in health care and their application

		Produce a simple economic evaluation of a new health care intervention Produce a deterministic sensitivity analysis (e.g. one-way, two-way, scenario analysis) Assess whether new health care interventions represent “good value for money”
Assessment, reporting, and transferability of economic evaluations (lecture, exercises, 4 hours)	Lianna Hede Hammeken, Department of Clinical Medicine	Critically assess the methodological quality of existing economic evaluations and interpret the validity and transferability of the results
Exercises (online session) (exercises, 4 hours)	Lianna Hede Hammeken, Department of Clinical Medicine	Use the models and methods of the field to analyse selected issues

** All rights reserved for changes during the semester due to e.g., illness, cancellations etc.*

Examination

- The exam format will be an individual written exam of 2 hour duration.
- The exam will contain both short answer questions and essay questions.
- This format was chosen to ensure that both knowledge, skills and competencies are tested.
- The exam assignment will be assessed according to the 7-point grading scale by an internal examiner..
- The exam will be distributed and should be handed in using Digital Exam.
- During the exam the students are not allowed to use any aids or communicate in any way with others, however, they are allowed to use the calculator on their PCs/MACs. The use of the internet is only allowed for the down- and upload of the exam.
- If the exam format is changed before the re-examination, this will be announced no later than 14 days before.

For further information about the examination, we refer to:
Digital Eksamen (DE)

Module title, ECTS credits (and possibly STADS code)
Profile: Medical Market access (MMA)
Marketing og market access inden for sundhedsvæsenet/ Marketing and market access for healthcare
5 ECTS

Location
Master of Science in Medicine with Industrial Specialisation, 1st semester
Study board for medicine

Module coordinator
The academic staff member responsible for the organisation and execution of the module.
The module leader may be the same person as the semester coordinator. If a person responsible for exam is pointed out, please state name and e-mail address here.

Søren Paaske Johnsen, spj@dcm.aau.dk; Department of Clinical Medicine (Perhaps there will be one more)

Type and language
Module type (e.g. study subject module, course module, project module etc.)
Language of instruction.

It is a course module and the course will be taught in English.

Objectives
Description of the content and objectives of the course as regards learning objectives of the students in the module. This comprises a transcript of the knowledge, skills and competences described in the study regulations and curriculum. Reference can be made to elaborations on semester Moodle site and/or to curriculum on Study Board website (applicable for MedIS and Medicine).

From Curriculum:

After attending this course, the student is expected to:

Knowledge
- Demonstrate knowledge of microeconomics, including imperfect market conditions
- Demonstrate knowledge of welfare economics, including the role of regulation in medical market access
- Explain the concept of value of products and services and its relation to costs
- Describe the business-to-business buying process within the health care sector including the regulatory and ethical pathways

Skills
- Collect data relevant for conducting a market analysis
- Apply game theory for pricing within oligopolistic conditions
- Apply the segmentation, targeting and positioning approach for different health care products and services
- Analyse the impact of major market errors in healthcare

Competences
- Select the most appropriate design for a specific market-related analysis
- Discuss the impact of different pricing strategies for decision making
- Assess the impact of classification systems for pharmaceuticals and medical devices

Academic content and conjunction with other modules/semesters
A brief and general description of the academic content of the module as well as the basis and motivation for the module; i.e. a brief review of the content and foundation of the module.
The intention is to provide students with an overview of each module and to create understanding of the module in relation to the semester and the entire programme.

Understanding the differences between market structures is essential for negotiation within health care. Market access within health care is determined by different kinds of sellers, buyers, and market conditions under which they operate.
In this course, marketing is applied to the entire life-cycle of relevant health care products and services. The course will introduce the students to microeconomics, including welfare economics (e.g. supply and demand) and how the health care market differs from the perfectly competitive market, along with market conditions (e.g. oligopoly, monopoly, monopsony) and market errors. After a short introduction to business-to-consumer marketing, including the segmentation, targeting and positioning approach, the course will predominantly focus on industrial sales (business-to-business marketing) with a particular attention to health care and international perspectives for market access.

Scope and expected performance
The expected scope of the module in terms of ECTS load. This comprises number of teaching hours, exercises, preparation time, travel activity (if applicable) etc.

The course is 5 ECTS and the students can expect approx. 150 hours teaching including lectures, exercises, preparations and exam. The course is offered as 8 lectures of 4 hours. Furthermore, three exercise sessions of 4 hours will be included.
Teaching hours (lectures): 4h x 11 lectures and exercises = 44 h (1.46 ECTS)
Preparation for the lectures: 8 h x 8 lectures = 64 h (2.12 ECTS)
Preparation for exercises: 4 h x 3 exercises = 12 h (0.40 ECTS)
Preparation and completion of exam: 30 h (1 ECTS)

Participants
Indication of the participants in the module, particularly if they include several year groups, programmes or another type of co-teaching.

The course is part of the Medical Market Access master programme.

Prerequisites for participation
Description of the prerequisites for students' participation in the course, i.e. previous modules/courses in other semesters etc. The overall intention is to emphasise the coherence of the programme. This may be a transcript of the text in the study regulations and curriculum.

No prerequisites as this is an introductory course.

Module activities (course sessions etc.)

Level 1		
Activity - type and title	**Lecturer including department affiliation***	**Learning goals from curriculum**
Lecture 1: Drug development and medical marketing – an overview	TBA	Describe the business-to-business buying process within the health care sector including the regulatory and ethical pathways.

		Demonstrate knowledge of welfare economics, including the role of regulation in medical market access.
Lecture 2: The foundation of marketing - welfarism and microeconomics	TBA	Demonstrate knowledge of microeconomics, including imperfect market conditions. Demonstrate knowledge of welfare economics, including the role of regulation in medical market access.
Lecture 3: Imperfect markets; monopoly and monopsony - the introduction of new medicine	TBA	Demonstrate knowledge of microeconomics, including imperfect market conditions. Analyse the impact of major market errors in healthcare.
Lecture 4: Pricing of prescription medicine and oligopolistic market conditions	TBA	Explain the concept of value of products and services and its relation to costs. Apply game theory for pricing within oligopolistic conditions. Discuss the impact of different pricing strategies for decision making.
Lecture 5: The Pricing & reimbursement process of a healthcare system and market access consideration; A Danish perspective.	TBA, and The Danish Medicine Council	Describe the business-to-business buying process within the health care sector including the regulatory and ethical pathways. Apply the segmentation, targeting and positioning approach for different health care products and services.
Exercise 1: Negotiation between monopsonistic authority and a pharmaceutical company	TBA, Department of clinical medicine. and Zealth – Market Access Consultancy	Explain the concept of value of products and services and its relation to costs. Analyse the impact of major market errors in healthcare Discuss the impact of different pricing strategies for decision making
Exercise 2: Health policy deicions-making stakeholders and implementation of recommendations and guidelines for strand treatment	TBA, Department of clinical medicine. and Rud Pedersen	Describe the business-to-business buying process within the health care sector including the regulatory and ethical pathways. Collect data relevant for conducting a market analysis.
Lecture 6: Interview as data collection method	Allan Riis, Department of clinical medicine	Collect data relevant for conducting a market analysis.

Lecture 7: Marketing strategy – Segmentation, targeting and positioning (STP) and Marketing Mix.	Flemming Witt Udsen, Department of health science and technology	Apply the segmentation, targeting and positioning approach for different health care products and services. Select the most appropriate design for a specific market-related analysis.
Lecture 8/exercise 3: A strategic approach to market access for medical devices	Anders Mærkedahl, NHTA consultancy and Danish Health Technology Council	Describe the business-to-business buying process within the health care sector including the regulatory and ethical. Assess the impact of classification systems for pharmaceuticals and medical devices.

***** All rights reserved for changes during the semester due to e.g., illness, cancellations etc.

Examination

- The exam format will be an individual written exam of 2 hour duration.
- The exam will contain both short answer questions and essay questions.
- This format was chosen to ensure that both knowledge, skills and competencies are tested.
- The exam assignment will be assessed according to the 7-point grading scale by an internal examiner..
- The exam will be distributed and should be handed in using Digital Exam
- During the exam it will be allowed to use the following aids: books, slides and notes. The use of internet is only allowed for down- and upload of the exam.
- If the exam format is changed before the re-examination, this will be announced no later than 14 days before.

For further information about examination, we refer to:

- Digital Eksamen (DE)

Module title, ECTS credits (and possibly STADS code)

Profile: BM, TM, MMA
Project with focus on the methodological approach/ Projekt med focus på den metodiske tilgang
15 ECTS

Location

Master of Science in Medicine with Industrial Specialisation, 1st semester
Study board for medicine

Module coordinator

The academic staff member responsible for the organisation and execution of the module.
The module leader may be the same person as the semester coordinator. If a person responsible for exam is pointed out, please state name and e-mail address here.

Profile coordinator BM: Maj Schneider Thomsen, mst@hst.aau.dk, Department of Health Science and Technology
Profile coordinator TM: Kristian Kjær-Staal Petersen kkp@hst.auu.dk, Department of Health Science and Technology
Profile coordinator MMA: Anita Egholm Jensen, aeje@dcm.aau.dk, Department of Clinical Medicine

Project supporting activity: Patrik Kjærsdam Telléus, pkt@hst.aau.dk, Department of Health Science and Technology

Type and language
Module type (e.g. study subject module, course module, project module etc.)
Language of instruction.

Project module and the language is English*

* Some parts of the projects will be conducted in Danish if the projects have elements of contact with patients in the Danish health care system.

Objectives
Description of the content and objectives of the course as regards learning objectives of the students in the module. This comprises a transcript of the knowledge, skills and competences described in the study regulations and curriculum. Reference can be made to elaborations on semester Moodle site and/or to curriculum on Study Board website (applicable for MedIS and Medicine).

From Curriculum:

Knowledge
- Understand the principles for conducting information search relevant for the problem
- Understand the methods used to address the problem

Skills
- Identify and frame a medically relevant problem
- Identify scientific literature relevant to the problem
- Use the selected scientific methods
- Generate empiric data relevant to the problem and interpret and discuss results
- Compare empiric data to scientific literature relevant to the problem
- Accommodate project group participants' diverse background and knowledge in relation to the project

Academic content and conjunction with other modules/semesters
A brief and general description of the academic content of the module as well as the basis and motivation for the module; i.e. a brief review of the content and foundation of the module.
The intention is to provide students with an overview of each module and to create understanding of the module in relation to the semester and the entire programme.

Overall, the project will enable the students to identify a medically relevant problem, find relevant scientific literature and methods to address the problem, apply the selected methods, and analyze the outcome. The subject of the projects will vary since there are different research topics represented in the sections of BM, TM, and MMA.

Scope and expected performance
The expected scope of the module in terms of ECTS load. This comprises number of teaching hours, exercises, preparation time, travel activity (if applicable) etc.

15 ECTS project (450 hours):

Project supporting activity: 45 hours
- Confrontation hours: 5 hours

Project work: 380 hours in total
- Confrontation hours for a group of four: 0.8x(13.5*4 students)/2=21.5 hours
- Preparation including exam: 25 hours

Participants
Indication of the participants in the module, particularly if they include several year groups, programmes or another type of co-teaching.

1st semester students of the Master of Science in Medicine with Industrial Specialisation with the BM, TM, and MMA profile.

Prerequisites for participation
Description of the prerequisites for students' participation in the course, i.e. previous modules/courses in other semesters etc. The overall intention is to emphasise the coherence of the programme. This may be a transcript of the text in the study regulations and curriculum.

None

Module activities (course sessions etc.)

Project supporting activity (1.5 ECTS):

As part of the project, the students will take part in a project supporting activity (1.5 ECTS) that can aid the learning of the following skill form the curriculum "Accommodate project group participants' diverse background and knowledge in relation to the project" and increase the student's general Problem-based learning (PBL) competences in relation to the projects. Thus, the two central elements are 1. PBL and group work, 2. PBL and scientific method.

Teacher: Patrik Kjærsdam Telléus

Part 1: 2 x teaching sessions of 3 hours each (2 x 45 min lectures followed by exercises)

Part 2: Written assignment. Each project group will hand in an assignment to Centre for Health Science Education and Problem-based Learning (CHSE), which subsequently will facilitate a session with each project group of 50 min. During the session, the students will receive feedback on the assignment and based on the feedback, the groups should revise the assignment and hand it in for final approval.

Project (13.5 ECTS):

Depending on which profile, BM, TM, or MMA, the students are expected to choose a project proposed for their profile as they are expected to be able to implement knowledge from the courses.

The supervisors are mainly affiliated to (but not limited to) The Department of Health Science Technology (HST) and Department of Clinical Medicine. External co-supervisors can be involved when relevant for the project.

Examination

Prerequisite for participating in the exam is participation in the project supporting activity.

1. Oral group examination
2. During the exam both the supervisor and maybe co-supervisor will be present together with an internal examiner
3. During the project period, the students will write a project and hand it in using "Digigtal Eksamen" – date TBA. The exam is initiated by the students giving a scientific presentation of their project, followed by questioning by the examiners.
4. There is 45 min available in total for each student covering: student presentations, questioning by examiners and grading. As an example a group of 4 students will be examined for 4 x 45 min = 3 hours covering: student presentations, questioning by examiners, and grading.

5. The project will be evaluated using the 7-point grading scale and the grade will be given individually and based on an overall assessment of:

a) The written project
b) The individual student presentation of the project
c) The individual performance of the students during the oral examination

For further information about examination, we refer to:

- Beskrivelse af gruppebaseret projekteksamen (Decription of group-exam)
- Digital Eksamen (DE)