Mälardalen University

School of Business, Society and Engineering
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COURSE GUIDE

For incoming exchange students 2024-2025

Engineering

ACADEMIC CALENDER AND STUDY PERIODS

The academic year is divided into two semesters of 20 weeks each. Each semester is divided into two study periods, accounting for 10 weeks each. Thus, the academic year has four study periods as follows:

Fall Semester 2024 *02.09.2024 - 19.01.2025*	Period 1 *02.09.2024 - 10.11.2024*	Period 1a *02.09.2024 - 10.11.2024*
		Period 1b *07.10.2024 - 10.11.2024*
	Period 2 *11.11.2024 - 19.01.2025*	Period 2a *11.11.2024 - 15.12.2024*
		Period 2b *16.12.2024 - 19.01.2025*

Spring Semester 2025 *20.01.2025 - 08.06.2025*	Period 3 *20.01.2025 - 30.03.2025*	Period 3a *20.01.2025 - 23.02.2025*
		Period 3b *24.02.2025 - 30.03.2025*
	Period 4 *31.03.2025 - 08.06.2025*	Period 4a *31.03.2025 - 04.05.2025*
		Period 4b *05.05.2025 - 08.06.2025*

WORKLOAD

The ordinary workload per semester is 30 ECTS credits (60 ECTS credits per academic year) where, you usually study 15 ECTS credits each study period depending on the structure of the course. Local students normally do not study more than 30 ECTS credits per semester.

When studying in Sweden, students normally take one course at a time, they do not do parallel studies, the courses stretch for 5 (7,5 ECTS credits) or 10 (15 ECTS credits) weeks. Some courses are however given parallel as part time courses i.e., 7,5 ECTS credits for 10 weeks and 15 ECTS credits for 20 weeks.

The time spent in a classroom for lectures or seminars is based on the content of the course and how the lecturer chooses to use the allotted time. If the course is connected to problem solving activities i.e., accounting, students will most likely have more time in the classroom with a lecturer in comparison to a course based on lots of reading and solving cases.

Students studying in Sweden normally do not spend more than 5 – 10 hours per week attending lectures in social science (business, psychology, etc.). Nevertheless, it does not mean that students have 30 – 35 hours free every week. Those 30 – 35 hours should be spent e.g., doing group work, studying, and preparing presentations for seminars and lectures. For every course, there are usually different types of examinations – each course normally ends with a written examination. In addition, students usually write papers during the course, either individually or as a group and attend seminars, which are all part of the examination and the final grade. This can feel quite different if you are used to spending 20 – 25 hours per week attending lectures at your home university.

International students find this way of studying quite frustrating in the beginning but soon realize that the studies here are built on individual responsibility and if you are not prepared for seminars and lectures it will be tough to pass the exam or succeed in group assignments.

Normally, you count that 1,5 ECTS credits equal 40 hours of workload (the same as a full- time job) which means that a 5-week course (7,5 ECTS credits) = 200-hour workload and a 10-week course (15 ECTS credits) = 400-hour workload.

SELECTING YOUR COURSES

When selecting courses, please make sure that:

- You fulfil the eligibility requirements
- The courses do not have the same schedule collision code.

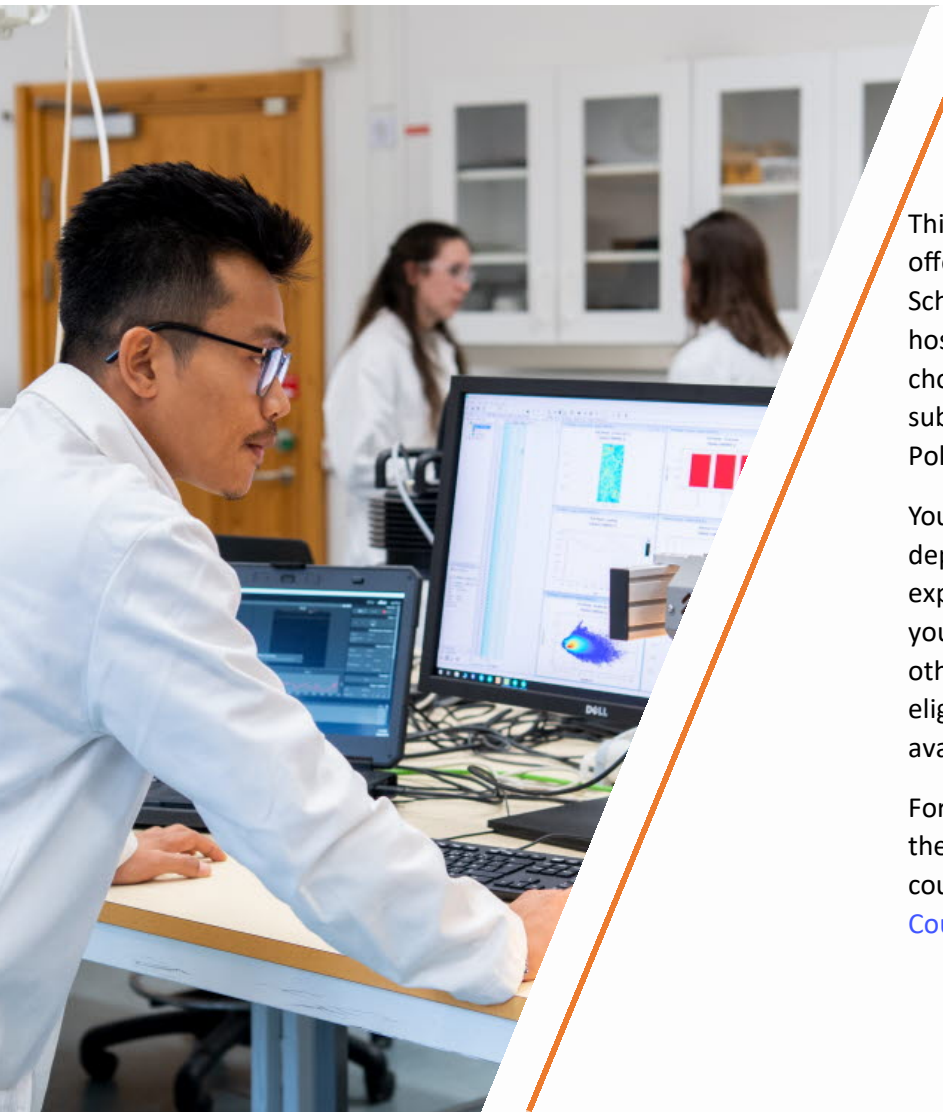
The schedule collision codes are as follows:

SCHEDULE COLLISION CODE	DESCRIPTION
K1	Courses with this code may have lectures, workshops, or seminars: • Monday afternoons • Wednesday mornings
K2	Courses with this code may have lectures, workshops, or seminars: • Monday mornings • Thursday mornings
K3	Courses with this code may have lectures, workshops, or seminars: • Tuesday mornings • Thursday afternoons
K4	Courses with this code may have lectures, workshops, or seminars: • Tuesday afternoons • Friday mornings
K5	Courses with this code may have lectures, workshops, or seminars: • Wednesday afternoons • Friday afternoons
X	Courses with this code cannot be combined with other courses taught during the same study period since these courses are paced full time during the period during which they are taught.
DISTANCE	Courses with this code are online-courses. The courses do not have any physical meetings and can be combined with all collision codes.

When selecting courses, please note the following information:

- Each semester is divided into 2 periods (1 and 2) and each of these periods may be divided into 2 sub-periods (1a and 1b or 2a and 2b)
- 15 ECTS credits courses with schedule collision code X are equivalent to full time studies during that period.
- Courses with the collision code “X” can only be combined with courses with collision code “distance” in the same study period.
- Courses with the same schedule collision code cannot be combined in the same study period.

Distance courses can be selected independently of other courses’ schedule collision codes. However, if you require a residence permit to study in Sweden, you can only select a distance course as an extra course since you need 30 ECTS of campus courses to get a student visa.



This course catalogue contains the courses offered within the subject Engineering at the School of Business, Society and Engineering (your host school during your exchange). You can also choose from the course catalogue within the subjects Business Administration, Economics and Political Science.

You can select courses offered by the other departments/schools at MDU, however you are expected to select at least 50% of your courses at your host school. Admission to courses offered by other schools may only be granted if you meet the eligibility requirements and if there are seats available in the course.

For more information about the courses given at the other departments/schools, please visit our course database:
Courses for Exchange Students at MDU

COURSE OFFER FALL SEMESTER 2024

Following courses are available for exchange students during the fall semester 2024, within the subject area of Engineering. All courses are given in English.

Undergraduate

COURSE CODE	COURSE NAME	ECTS	STUDY PERIOD	COLLISION CODE
BTA209	Energy Efficient Buildings	15	1+2	K1
ERA217	Introduction to Sustainable Energy System	7,5	1	K4
IEO116	Organisation: Form and function	7,5	2	K2
IEO117	Industrial Economics	7,5	1	K3+K5
OAH200	Project in Energy and Environmental Engineering	15	1+2	X
OAH201	Project in Energy and Environmental Engineering	30	1+2	X

Graduate

COURSE CODE	COURSE NAME	ECTS	STUDY PERIOD	COLLISION CODE
ERA305	Sustainable Energy Systems - Project	10	1+2	K3
ERA306	Sustainable Energy Systems - Advanced studies	20	1+2	K2+K5
ERA318	Simulations and Forecasting of Electricity Markets	7,5	2	K2+K5
ERA319	Policy Instruments, Strategy and Technical Change	7,5	1	K3
MTK326	Atmospheric Pollution and Air Quality	7,5	2	Distance
MTK327	Applied Statistics in Engineering	2,5	2	Distance
MTK328	Scientific Methods in Environmental Engineering	5	2	Distance
MTK333	Environmental Economics	2,5	1	Distance
MTK334	Industrial Dynamics	2,5	1	Distance
MTK335	Circular Economy in Context of Environmental Engineering	2,5	1	Distance
MTK336	Digital Remote Sensing and GIS in Environmental Engineering	7,5	1	Distance
MTK337	Multivariate Data Analysis in Engineering	7,5	1	Distance
MTK338	System Modelling in Environmental Engineering	7,5	1	Distance
MTK340	Biomass Utilization and Conversion	7,5	2	Distance
MTK341	Real-time Analysis in Environmental Engineering	7,5	2	Distance
MTK342	Wastewater Treatment and Management	7,5	2	Distance
MTK347	Climate Change and Energy: Past, Present and Future	7,5	1	Distance
OAH302	Project in Future Energy	15	1+2	X
OAH303	Project in Future Energy	30	1+2	X
OAH304	Scientific Manuscript in Energy and Environmental Engineering - Process, Method and Implementation	30	1+2	X

COURSE OFFER SPRING SEMESTER 2025

Following courses are available for exchange students during the spring semester 2025, within the subject area of Engineering. All courses are given in English.

Undergraduate

COURSE CODE	COURSE NAME	ECTS	STUDY PERIOD	COLLISION CODE
ERA102	Applied Thermodynamics	7,5	4	K3+K4
ERA224	Turbine Technology and Advanced System	7,5	3	K2
IEO119	Controlling and Financing of Industrial Operations	7,5	3	K1
IEO120	Global Operations Management	7,5	3	K4+K5
OAH116	Introduction to Technical Projects	7,5	4	K2K4
OAH200	Project in Energy and Environmental Engineering	15	3+4	X
OAH201	Project in Energy and Environmental Engineering	30	3+4	X

Graduate

COURSE CODE	COURSE NAME	ECTS	STUDY PERIOD	COLLISION CODE
ERA301	International Energy Systems	7,5	3	K1
ERA311	Process Modelling	7,5	3	K2
ERA312	Process Simulation	7,5	4	K1+K3+K4
ERA320	Process Optimization	7,5	4	K2
IEO302	Industrial Change: Challenges and Opportunities	7,5	4	K3
IEO307	Managing Industrial Change	7,5	3	K2
MTK329	Freshwater Treatment and Management	7,5	3	Distance
MTK330	Sustainable Cities and Infrastructure	7,5	3	Distance
MTK331	Sustainable Production and Consumption	7,5	4	Distance
MTK332	Resource Recovery and Solid Waste Management	7,5	4	Distance
MTK349	Applied Spectral Imaging for Sustainable Engineering	7,5	3	Distance
OAH302	Project in Future Energy	15	3+4	X
OAH303	Project in Future Energy	30	3+4	X
OAH304	Scientific Manuscript in Energy and Environmental Engineering - Process, Method and Implementation	30	3+4	X

COURSE OFFER OVERVIEW

The following course schedule gives you an overview of all courses and in which study period they are given. Please note that you can combine courses from the same study period as long as they don't have the same collision code or the collision code "X".

	FALL SEMESTER 2024				SPRING SEMESTER 2025			
	1		2		3		4	
	A	B	A	B	A	B	A	B
Building Engineering	Energy Efficient Buildings (K1)							
Energy Engineering	Introduction to Sustainable Energy Systems (K4)		Simulations and Forecasting of Electricity Markets (K2+K5)		Turbine Technology and Advanced System (K2)		Applied Thermodynamics (K3+K4)	
	Policy Instruments, Strategy and Technical Change (K3)				International Energy Systems (K1)		Process Simulation (K1+K3+K4)	
	Sustainable Energy Systems – Project (K3)				Process Modelling (K2)		Process Optimization (K2)	
	Sustainable Energy Systems – Advanced Studies (K2+K5)							
Industrial Engineering and Management	Industrial Economics (K3+K5)		Organisation: Form and Function (K2)		Controlling and Financing of Industrial Operations (K1)		Industrial Change: Challenges and Opportunities (K3)	
					Global Operations Management (K4+K5)			
					Managing Industrial Change (K2)			
Environmental Engineering	Environmental Economics (Distance)		Atmospheric Pollution and Air Quality (Distance)		Freshwater Treatment and Management (Distance)		Sustainable Production and Consumption (Distance)	
	Industrial Dynamics (Distance)		Applied Statistics in Engineering (Distance)		Sustainable Cities and Infrastructure (Distance)		Resource Recovery and Solid Waste Management (Distance)	
	Circular Economy in Context of Environmental Engineering (Distance)		Scientific Methods in Environmental Engineering (Distance)		Applied Spectral Imaging for Sustainable Engineering (Distance)			
	Digital Remote Sensing and GIS in Environmental Engineering (Distance)		Biomass Utilization and Conversion (Distance)					
	Multivariate Data Analysis in Engineering (Distance)		Real-time Analysis in Environmental Engineering (Distance)					
	System Modelling in Environmental Engineering (Distance)		Wastewater Treatment and Management (Distance)					
	Climate Change and Energy: Past, Present and Future (Distance)							
Other Subjects within Technology	Project in Energy and Environmental Engineering (X)						Introduction to Technical Projects (K2+K4)	
	Project in Energy and Environmental Engineering (X)				Project in Energy and Environmental Engineering (X)			
	Project in Future Energy (X)				Project in Energy and Environmental Engineering (X)			
	Project in Future Energy (X)				Project in Future Energy (X)			
	Scientific Manuscript in Energy and Environmental Engineering – Process, Method and Implementation (X)				Project in future Energy (X)			
					Scientific Manuscript in Energy and Environmental Engineering – Process, Method and Implementation (X)			

EXAMPLE OF COURSES

When you select your courses, you have to make sure they don't collide schedule wise. If the courses are taught in the same study period, they can not have the same collision code or the collision code "X".

The following example shows a combination of courses for the fall semester 2024.

Example of a course combination within the subject of Engineering, during fall semester 2024:

Energy Efficient Buildings (15 ECTS)
K1

Introduction to Sustainable Energy Systems (7,5 ECTS) K4	Organisation: Form and Function (7,5 ECTS) K2
Study period 1	Study period 2
The course "Energy Efficient Buildings" runs through the whole semester in 50% study pace. It can be combined with a course with a different collision code. Here combined with one course during period 1.	"Energy Efficient Buildings" continues in period 2. Now combined with a new course, for the rest of the semester.

COURSE INFORMATION

Here you'll find information about all the courses and links to the syllabus on our website. You can choose any courses you want to, as long as you meet the eligibility requirements. Make sure that your chosen courses don't have the same study periods and collision codes.

FALL SEMESTER 2024

UNDERGRADUATE

ENERGY EFFICIENT BUILDINGS

COURSE CODE	BTA209
SUBJECT AREA	Building Engineering
ECTS CREDITS	15
LEVEL	Undergraduate
STUDY PERIOD	1+2
COLLISION CODE	K1
LINK TO THE SYLLABUS	Energy Efficient Buildings
ELIGIBILITY REQUIREMENTS	75 credits within an Engineering program including 2 credits within Building Physics and 2 credits within Building Services Engineering (HVAC), or similar.
COURSE CONTENT	Calculations of the energy balance of buildings without available energy calculation programs (existing software), primarily monthly calculations for residential buildings. Building technology and building services engineering (HVAC) that contribute to lower energy consumption, with different conditions for new and existing buildings. Electric efficiency for fans, pumps, lighting etc. Heat pumps. Heat exchangers. Passive solar heating, active solar heating and solar electricity. Experiences from existing energy efficient buildings. Energy efficiency and conservation requirements for existing buildings – contradictions and opportunities. Energy efficiency and healthy buildings – contradictions and opportunities. Building related problems and health issues. Indoor climate issues regarding air quality, thermal indoor climate and acoustics. The importance of ventilation for energy efficiency and indoor climate. Building technology and calculations regarding moisture problems.

INTRODUCTION TO SUSTAINABLE ENERGY SYSTEM

COURSE CODE	ERA217
SUBJECT AREA	Energy Engineering
ECTS CREDITS	7,5
LEVEL	Undergraduate
STUDY PERIOD	1
COLLISION CODE	K4
LINK TO THE SYLLABUS	Introduction to Sustainable Energy Systems
ELIGIBILITY REQUIREMENTS	75 credits of completed courses within an Engineering program which includes Applied Thermodynamics, Mechanics of Fluids and Heat and Mass Transfer, or similar.
COURSE CONTENT	The course provides basic knowledge on issues related to society's energy and sustainable development. The course deals with different fuels, combustion process and the emissions produced during combustion. The course covers combustion installations and technical equipment used for gas cleaning. The course includes review of the thermodynamic cycle for converting heat into mechanical energy, steam cycle with heat from different fuels, gas turbine cycle and energy conversion in turbines.

ORGANISATION: FORM AND FUNCTION

COURSE CODE	IEO116
SUBJECT AREA	Industrial Engineering and Management
ECTS CREDITS	7,5
LEVEL	Undergraduate
STUDY PERIOD	2
COLLISION CODE	K2
LINK TO THE SYLLABUS	Organisation: Form and Function
ELIGIBILITY REQUIREMENTS	15 credits within "industrial engineering and management" and 7,5 credits within "other subjects within technology" or comparable.
COURSE CONTENT	The purpose of the course is to deepen the students' knowledge about how to design and optimize sustainable organizations by applying various systemic perspectives and by modelling organizations as sociotechnical systems. Attention is also given to analysis, modelling and evaluation of organizations. The course furthermore aims at stimulating students to reflect about which competences engineers need to develop in order to act as change agents and to help them improve their group working skills.

INDUSTRIAL ECONOMICS

COURSE CODE	IEO117
SUBJECT AREA	Industrial Engineering and Management
ECTS CREDITS	7,5
LEVEL	Undergraduate
STUDY PERIOD	1
COLLISION CODE	K3+K5
LINK TO THE SYLLABUS	Industrial Economics
ELIGIBILITY REQUIREMENTS	45 credits within Industrial Economics, which includes 7,5 credits within the subject "industrial engineering and management", or comparable.
COURSE CONTENT	The course provides knowledge on how microeconomic theory, based on mathematical methods, can be used to provide management information and a basis for decision making in companies. It also provides knowledge on how to analyse optimal and strategic aspects from a business perspective. The course is based on applications analysed with mathematical methods and students are trained to solve optimization problems in varying business contexts.

PROJECT IN ENERGY AND ENVIRONMENTAL ENGINEERING

COURSE CODE	OAH200
SUBJECT AREA	Energy and Environmental Engineering
ECTS CREDITS	15
LEVEL	Undergraduate
STUDY PERIOD	1+2
COLLISION CODE	X
LINK TO THE SYLLABUS	Project in Energy and Environmental Engineering
ELIGIBILITY REQUIREMENTS	120 credits completed courses related to the research profile Future Energy (e.g. intelligent energy systems, renewable energy, power engineering, energy storage, energy markets, energy efficiency, efficient and smart buildings, biological processes related to renewable energy, simulation and optimisation of process industry), including 30 credits in mathematics/natural science courses
COURSE CONTENT	The project work carried out within a development project or in cooperation with industrial partners, containing one relevant problem related to the field of Future Energy. The project task contains one of the following elements: measurement / experiments and analysis of results, calculation / simulation / optimization and analysis of results, planning / design.

PROJECT IN ENERGY AND ENVIRONMENTAL ENGINEERING

COURSE CODE	OAH201
SUBJECT AREA	Energy and Environmental Engineering
ECTS CREDITS	30
LEVEL	Undergraduate
STUDY PERIOD	1+2
COLLISION CODE	X
LINK TO THE SYLLABUS	Project in Energy and Environmental Engineering
ELIGIBILITY REQUIREMENTS	120 credits completed courses related to the research profile Future Energy (e.g. intelligent energy systems, renewable energy, power engineering, energy storage, energy markets, energy efficiency, efficient and smart buildings, biological processes related to renewable energy, simulation and optimisation of process industry), including 30 credits in mathematics/natural science courses.
COURSE CONTENT	The project work carried out within a development project in Future Energy or in cooperation with industrial partners, containing a relevant problem in related to the field of Future Energy. The project task contains one or more of the following elements: measurement / experiments and analysis of results, calculation / simulation / optimization and analysis of results, planning / design.

GRADUATE

SUSTAINABLE ENERGY SYSTEMS - PROJECT

COURSE CODE	ERA305
SUBJECT AREA	Energy Engineering
ECTS CREDITS	10
LEVEL	Graduate
STUDY PERIOD	1+2
COLLISION CODE	K3
LINK TO THE SYLLABUS	Sustainable Energy Systems - Project
ELIGIBILITY REQUIREMENTS	180 credits within an energy engineering program whereof 65 credits within energy engineering including 7,5 credits from the course Heat and Power Technology or 7,5 credits from the course Introduction to sustainable energy systems
COURSE CONTENT	A larger project assignment, concerning an issue of current interest within the area of sustainable energy systems, accomplished in a working group. The assignment includes one or several of the following tasks: measurement/experiment and analysis of the results, calculation/simulation/optimization and analysis of the results, planning/dimensioning

SUSTAINABLE ENERGY SYSTEMS – ADVANCED STUDIES

COURSE CODE	ERA306
SUBJECT AREA	Energy Engineering
ECTS CREDITS	20
LEVEL	Graduate
STUDY PERIOD	1+2
COLLISION CODE	K2+K5
LINK TO THE SYLLABUS	Sustainable Energy Systems - Advanced Studies
ELIGIBILITY REQUIREMENTS	180 credits within an energy engineering program whereof 65 credits within energy engineering including 7,5 credits within Heat and Power Technology or 7,5 credits within sustainable energy systems and 15 credits on advanced level, whereof 10 credits in energy engineering.
COURSE CONTENT	The course consists mainly of individual analysis and calculation assignments within sustainable energy systems such as thermal engineering, power systems, solar cells and solar collectors, biofuels, transmission/distribution and more.

SIMULATIONS AND FORECASTING OF ELECTRICITY MARKETS

COURSE CODE	ERA318
SUBJECT AREA	Energy Engineering
ECTS CREDITS	7,5
LEVEL	Graduate
STUDY PERIOD	2
COLLISION CODE	K2+K5
LINK TO THE SYLLABUS	Simulation and Forecasting of Electricity Markets
ELIGIBILITY REQUIREMENTS	120 hp including 90 hp in engineering or science including 7,5 hp mathematics.
COURSE CONTENT	Structure of electricity market Electricity trading and pricing Modelling of power generation technologies Electricity market simulation and optimization Demand forecasting

POLICY INSTRUMENTS, STRATEGY AND TECHNICAL CHANGE

COURSE CODE	ERA319
SUBJECT AREA	Energy Engineering
ECTS CREDITS	7,5
LEVEL	Graduate
STUDY PERIOD	1
COLLISION CODE	K3
LINK TO THE SYLLABUS	Policy Instruments, Strategy and Technical Change
ELIGIBILITY REQUIREMENTS	120 hp including 90 hp in engineering or science including 7,5 hp mathematics.
COURSE CONTENT	A project assignment that is carried out as group work, focusing on relevant questions related to the area of sustainable energy systems. The project assignment contains one or more elements: measurement/experiment and analysis of results from a techno-economic-policy perspective, calculation/simulation/optimization and analysis of results from a techno-economic-policy perspective, design/dimensioning in relation to a techno- economic-policy perspective

ATMOSPHERIC POLLUTION AND AIR QUALITY

COURSE CODE	MTK326
SUBJECT AREA	Environmental Engineering
ECTS CREDITS	7,5
LEVEL	Graduate
STUDY PERIOD	2
COLLISION CODE	Distance
LINK TO THE SYLLABUS	Atmospheric Pollution and Air Quality
ELIGIBILITY REQUIREMENTS	120 credits of which 90 credits engineering and/or natural science
COURSE CONTENT	The course will mainly address the following: Atmospheric composition, atmospheric pollution and pollutants, atmospheric dispersion, transport and deposition, effects on environment and health, air quality and emissions assessment, and control of emissions from motor vehicles and stationary sources, basic regulatory frameworks, and the role of air quality for sustainable development.

APPLIED STATISTICS IN ENGINEERING

COURSE CODE	MTK327
SUBJECT AREA	Environmental Engineering
ECTS CREDITS	2,5
LEVEL	Graduate
STUDY PERIOD	2
COLLISION CODE	Distance
LINK TO THE SYLLABUS	Applied Statistics in Engineering
ELIGIBILITY REQUIREMENTS	120 credits of which 90 credits engineering and/or natural science and 7.5 credits in mathematics.
COURSE CONTENT	The course will mainly address the following: Statistical thinking and understanding; statistical significance; statistical inference; correlation and linear regression; analysis of variance (ANOVA)

SCIENTIFIC METHODS IN ENVIRONMENTAL ENGINEERING

COURSE CODE	MTK328
SUBJECT AREA	Environmental Engineering
ECTS CREDITS	5
LEVEL	Graduate
STUDY PERIOD	2
COLLISION CODE	Distance
LINK TO THE SYLLABUS	Scientific Methods in Environmental Engineering
ELIGIBILITY REQUIREMENTS	120 credits of which 90 credits engineering and/or natural science.
COURSE CONTENT	The course will mainly address the following: cross disciplinary research methods in environmental engineering; literature search, reference management; scientific writing and presentation; critical review of the own research work and constructive feedback on others work; research ethics.

ENVIRONMENTAL ECONOMICS

COURSE CODE	MTK333
SUBJECT AREA	Environmental Engineering
ECTS CREDITS	2,5
LEVEL	Graduate
STUDY PERIOD	1
COLLISION CODE	Distance
LINK TO THE SYLLABUS	Environmental Economics
ELIGIBILITY REQUIREMENTS	120 credits of which 90 credits engineering and/or natural science.
COURSE CONTENT	The course will mainly address the following: - Cases with a focus on sustainability and climate change issues - Relevant environmental policies on global level to national levels, with focus on EU and Sweden. - Economic value of the environment - Economic effects of environmental externalities financial implications of environmental policies Relations between externalities, environmental policies and sustainable development

INDUSTRIAL DYNAMICS

COURSE CODE	MTK334
SUBJECT AREA	Environmental Engineering
ECTS CREDITS	2,5
LEVEL	Graduate
STUDY PERIOD	1
COLLISION CODE	Distance
LINK TO THE SYLLABUS	Industrial Dynamics
ELIGIBILITY REQUIREMENTS	120 credits of which 90 credits engineering and/or natural science.
COURSE CONTENT	The theoretical base of the course derives from the areas of industrial dynamics and socio-technical systems theory with strong links to evolutionary economics and institutional economics. Several cases of industrial transformation are presented with a mixture of contemporary cases and historical examples. Methods applied to analyze industrial dynamics in the context of environmental protection and sustainability are presented.

CIRCULAR ECONOMY IN CONTEXT OF ENVIRONMENTAL ENGINEERING

COURSE CODE	MTK335
SUBJECT AREA	Environmental Engineering
ECTS CREDITS	2,5
LEVEL	Graduate
STUDY PERIOD	1
COLLISION CODE	Distance
LINK TO THE SYLLABUS	Circular Economy in Context of Environmental Engineering
ELIGIBILITY REQUIREMENTS	120 hp including 90 hp engineering and/or natural science
COURSE CONTENT	The course addresses the circular economy concept and its challenges, barriers and limitations in the context of environmental engineering. In addition, the course deals with how circular economy can contribute to solve current environmental challenges related to the use and waste management of important global resources.

DIGITAL REMOTE SENSING AND GIS IN ENVIRONMENTAL ENGINEERING

COURSE CODE	MTK336
SUBJECT AREA	Environmental Engineering
ECTS CREDITS	7,5
LEVEL	Graduate
STUDY PERIOD	1
COLLISION CODE	Distance
LINK TO THE SYLLABUS	Digital Economy in Context of Environmental Engineering
ELIGIBILITY REQUIREMENTS	120 credits of which 90 credits engineering and/or natural science and 7.5 credits mathematics.
COURSE CONTENT	The course mainly addresses the following: Applications of digital remote sensing, photogrammetry and GIS tools for spatial analysis of air, water and land, related to environmental engineering. Retrieval and preparation of raster and vector data, problem-based raster image, and vector data analysis, digital RS and GIS for environmental monitoring and decision support, as well as applications toward sustainable development.

MULTIVARIATE DATA ANALYSIS IN ENGINEERING

COURSE CODE	MTK337
SUBJECT AREA	Environmental Engineering
ECTS CREDITS	7,5
LEVEL	Graduate
STUDY PERIOD	1
COLLISION CODE	Distance
LINK TO THE SYLLABUS	Multivariate Data Analysis in Engineering
ELIGIBILITY REQUIREMENTS	120 credits of which 90 credits engineering and/or natural science, and 7.5 credits mathematics.
COURSE CONTENT	The course mainly addresses the following: - Explanatory data analysis and interpretation - Multivariate qualitative and quantitative data analysis and interpretation using artificial intelligence (AI) and machine learning algorithms - Multivariate time-series data analysis and interpretation

SYSTEM MODELLING IN ENVIRONMENTAL ENGINEERING

COURSE CODE	MTK338
SUBJECT AREA	Environmental Engineering
ECTS CREDITS	7,5
LEVEL	Graduate
STUDY PERIOD	1
COLLISION CODE	Distance
LINK TO THE SYLLABUS	System Modelling in Environmental Engineering
ELIGIBILITY REQUIREMENTS	120 credits of which 90 credits engineering and/or natural science, and 7.5 credits mathematics.
COURSE CONTENT	Fundamentals of models, possible uses and limitations, classification of models (physical vs. mathematical, static vs dynamic, mechanistic vs empirical, stochastic vs deterministic), model development and selection, model validation, parameter estimation, common models in environmental engineering (such as growth and biological processes), different simulation software and mathematical tools.

BIOMASS UTILIZATION AND CONVERSION

COURSE CODE	MTK340
SUBJECT AREA	Environmental Engineering
ECTS CREDITS	7,5
LEVEL	Graduate
STUDY PERIOD	2
COLLISION CODE	Distance
LINK TO THE SYLLABUS	Biomass Utilization and Conversion
ELIGIBILITY REQUIREMENTS	120 credits including 90 credits in engineering and/or natural science, of which 15 credits on advanced level, and 7.5 credits mathematics.
COURSE CONTENT	The course provides an overview of biomass resources and their availability and potential for energy conversion. Further, the course gives an overview about state-of-the art and future conversion technologies for biomass and related biofuels. System analysis tools are used to assess biomass-based conversion technologies in an industrial context.

REAL-TIME ANALYSIS IN ENVIRONMENTAL ENGINEERING

COURSE CODE	MTK341
SUBJECT AREA	Environmental Engineering
ECTS CREDITS	7,5
LEVEL	Graduate
STUDY PERIOD	7,5
COLLISION CODE	Distance
LINK TO THE SYLLABUS	Real-time Analysis in Environmental Engineering
ELIGIBILITY REQUIREMENTS	120 credits including 90 credits in engineering and/or natural science, of which 15 credits on advanced level, and 7.5 credits mathematics.
COURSE CONTENT	The course mainly addresses the following: - State-of-the-art real-time analytical spectroscopic methods. - Chemometrics (data processing and interpretation) using artificial intelligence (AI) and machine learning algorithms. - Implementation of real-time analytical techniques for process and environmental monitoring, control and optimization.

WASTEWATER TREATMENT AND MANAGEMENT

COURSE CODE	MTK342
SUBJECT AREA	Environmental Engineering
ECTS CREDITS	7,5
LEVEL	Graduate
STUDY PERIOD	2
COLLISION CODE	Distance
LINK TO THE SYLLABUS	Wastewater Treatment and Management
ELIGIBILITY REQUIREMENTS	120 credits including 90 credits in engineering and/or natural science, of which 15 credits on advanced level, and 7.5 credits mathematics.
COURSE CONTENT	The course will mainly address the following: The urban water cycle; Sources of pollution; Wastewater characteristics; Physical, chemical and biological treatment of wastewater; Potentials for reuse of wastewater; Emerging technologies for wastewater treatment

CLIMATE CHANGE AND ENERGY: PAST, PRESENT AND FUTURE

COURSE CODE	MTK347
SUBJECT AREA	Environmental Engineering
ECTS CREDITS	7,5
LEVEL	Graduate
STUDY PERIOD	1
COLLISION CODE	Distance
LINK TO THE SYLLABUS	Climate Change and Energy: Past, Present and Future
ELIGIBILITY REQUIREMENTS	120 credits of which 90 credits engineering or natural science.
COURSE CONTENT	The course will mainly address the following: Climate change, physical and chemical processes related to atmosphere, biosphere, hydrosphere and lithosphere, expected and actual consequences of climate change, greenhouse effect, global warming, effects of energy production on climate, CO2 and other greenhouse gases, climate monitoring and modelling, negative carbon emissions, sustainable development goals, actions to adapt to and mitigate climate change and its impacts.

PROJECT IN FUTURE ENERGY

COURSE CODE	OAH302
SUBJECT AREA	Other Subjects Within Technology
ECTS CREDITS	15
LEVEL	Graduate
STUDY PERIOD	1+2
COLLISION CODE	X
LINK TO THE SYLLABUS	Project in Future Energy
ELIGIBILITY REQUIREMENTS	180 credits completed courses related to the research profile Future Energy (e.g. intelligent energy systems, renewable energy, power engineering, energy storage, energy markets, energy efficiency, efficient and smart buildings, biological processes related to renewable energy, simulation and optimisation of process industry
COURSE CONTENT	The advanced project work carried out in a current research project in Future Energy or in cooperation with industrial partner, containing current one research problem in the field. The project task contains one of the following elements: measurement / experiments and analysis of results, calculation / simulation / optimization and analysis of results, planning / design.

PROJECT IN FUTURE ENERGY

COURSE CODE	OAH303
SUBJECT AREA	Other Subjects Within Technology
ECTS CREDITS	30
LEVEL	Graduate
STUDY PERIOD	1+2
COLLISION CODE	X
LINK TO THE SYLLABUS	Project in Future Energy
ELIGIBILITY REQUIREMENTS	180 credits completed courses related to the research profile Future Energy
COURSE CONTENT	The advanced project work carried out in a current research project in Future Energy or in cooperation with industrial partner, containing current research problem in the field. The project task contains one or more of the following elements: measurement / experiments and analysis of results, calculation / simulation / optimization and analysis of results, planning / design.

SCIENTIFIC MANUSCRIPT IN ENERGY AND ENVIRONMENTAL ENGINEERING – PROCESS, METHOD AND IMPLEMENTATION

COURSE CODE	OAH304
SUBJECT AREA	Other Subjects within Technology
ECTS CREDITS	30
LEVEL	Graduate
STUDY PERIOD	1+2
COLLISION CODE	X
LINK TO THE SYLLABUS	Scientific Manuscript in Energy and Environmental Engineering-Process, Method and Implementation
ELIGIBILITY REQUIREMENTS	180 credits completed courses related to the research profile Future Energy (e.g. intelligent energy systems, renewable energy, power engineering, energy storage, energy markets, energy efficiency, efficient and smart buildings, biological processes related to renewable energy, simulation and optimisation of process industry).
COURSE CONTENT	This course increases the understanding for scientific writing, and it will conducted parallel with an individual work where results from a project are included in a manuscript. In the course train the skills to write a scientific publication for a scientific journal or conference. The participants will obtain a deepened understanding of the main components in a scientific work, and the importance to describe/understand how knowledge gaps that are addressed. Based on this a clear research question, suitable methodologies, and the scientific result be presented. Finally, the course addresses various strategies on how to use discussions and conclusion parts to conclude the scientific publication.

SPRING SEMESTER 2025

UNDERGRADUATE

APPLIED THERMODYNAMICS

COURSE CODE	ERA102
SUBJECT AREA	Energy Engineering
ECTS CREDITS	7,5
LEVEL	Undergraduate
STUDY PERIOD	4
COLLISION CODE	K3+K4
LINK TO THE SYLLABUS	Applied Thermodynamics
ELIGIBILITY REQUIREMENTS	None
COURSE CONTENT	First law of thermodynamics, state parameters, heat, work. Ideal gases, ideal gas equation of state, state changes. Cycles, heat engine, refrigeration/heat pump. Carnot cycle. Second law of thermodynamics, entropy, isentropic efficiency. Exergy. Cycle performance, gas turbine cycle (Brayton cycle), steam turbine cycle (Rankine cycle), Otto and diesel engine. Gas mixtures and psychrometry.

TURBINE TECHNOLOGY AND ADVANCED SYSTEMS

COURSE CODE	ERA224
SUBJECT AREA	Energy Engineering
ECTS CREDITS	7,5
LEVEL	Undergraduate
STUDY PERIOD	3
COLLISION CODE	K2
LINK TO THE SYLLABUS	Turbine Technology and Advanced Systems
ELIGIBILITY REQUIREMENTS	90 credits within an engineering programme including 5 credits of Applied Thermodynamics or similar, 5 credits Fluid Mechanics or similar, and 7,5 credits Mathematics or equivalent.
COURSE CONTENT	Gas turbine applications and performance as well as turbomachinery design (the various components and system functionality, design and operation). The energy conversion process in hybrid-electric concepts and their components. Particular focus will be given to energy performance during the operation of different system solutions. The course also includes laboratory work, study visits and assignments.

CONTROLLING AND FINANCING OF INDUSTRIAL OPERATIONS

COURSE CODE	IEO119
SUBJECT AREA	Industrial Engineering and Management
ECTS CREDITS	7,5
LEVEL	Undergraduate
STUDY PERIOD	3
COLLISION CODE	K1
LINK TO THE SYLLABUS	Controlling and Financing of Industrial Operations
ELIGIBILITY REQUIREMENTS	20 hp within the subject "industrial engineering and management" and 7,5 hp within the subject "other subjects within technology" or comparable.
COURSE CONTENT	Lectures introducing tools and processes that industrial enterprises implement to efficiently allocate financial resources are combined with group work and individual assignments. During the course, students will be trained in the practical use of methods and models, and will evaluate their usefulness. Finally, the students will actively work to produce financial data to base decisions on when it comes to the optimizations and changes of processes through investments.

GLOBAL OPERATIONS MANAGEMENT

COURSE CODE	IEO120
SUBJECT AREA	Industrial Engineering and Management
ECTS CREDITS	7,5
LEVEL	Undergraduate
STUDY PERIOD	3
COLLISION CODE	K4+K5
LINK TO THE SYLLABUS	Global Operations Management
ELIGIBILITY REQUIREMENTS	45 credits within a MSc programme in Industrial Engineering and Management, which includes 7.5 credits in the field of Industrial Economics and Organization and 7.5 credits in other engineering subjects.
COURSE CONTENT	This course combines lectures with teamwork in order to offer insight on important areas of operations management, and to give students the possibility to apply such insights on practical cases/problems. Students' previous knowledge and interests are mobilized through workshops/seminars and teamwork. Students are also trained in scientific writing through different activities.

INTRODUCTION TO TECHNICAL PROJECTS

COURSE CODE	OAH116
SUBJECT AREA	Other Subjects Within Technology
ECTS CREDITS	7,5
LEVEL	Undergraduate
STUDY PERIOD	4
COLLISION CODE	K2+K4
LINK TO THE SYLLABUS	Introduction to Technical Projects
ELIGIBILITY REQUIREMENTS	None
COURSE CONTENT	

PROJECT IN ENERGY AND ENVIRONMENTAL ENGINEERING

COURSE CODE	OAH200
SUBJECT AREA	Other Subjects Within Technology
ECTS CREDITS	15
LEVEL	Undergraduate
STUDY PERIOD	3+4
COLLISION CODE	X
LINK TO THE SYLLABUS	Project in Energy and Environmental Engineering
ELIGIBILITY REQUIREMENTS	120 credits completed courses related to the research profile Future Energy, including 30 credits in mathematics/natural science courses.
COURSE CONTENT	The project work carried out within a development project or in cooperation with industrial partners, containing one relevant problem related to the field of Future Energy. The project task contains one of the following elements: measurement / experiments and analysis of results, calculation / simulation / optimization and analysis of results, planning / design.

PROJECT IN ENERGY AND ENVIRONMENTAL ENGINEERING

COURSE CODE	OAH201
SUBJECT AREA	Other Subjects Within Technology
ECTS CREDITS	30
LEVEL	Undergraduate
STUDY PERIOD	3+4
COLLISION CODE	X
LINK TO THE SYLLABUS	Project in Energy and Environmental Engineering
ELIGIBILITY REQUIREMENTS	120 credits completed courses related to the research profile Future Energy, including 30 credits in mathematics/natural science courses.
COURSE CONTENT	The project work carried out within a development project in Future Energy or in cooperation with industrial partners, containing a relevant problem in related to the field of Future Energy. The project task contains one or more of the following elements: measurement / experiments and analysis of results, calculation / simulation / optimization and analysis of results, planning / design.

GRADUATE

INTERNATIONAL ENERGY SYSTEMS

COURSE CODE	ERA301
SUBJECT AREA	Energy Engineering
ECTS CREDITS	7,5
LEVEL	Graduate
STUDY PERIOD	3
COLLISION CODE	K1
LINK TO THE SYLLABUS	International Energy Systems
ELIGIBILITY REQUIREMENTS	150 credits in an energy engineering program or 150 credits in an industrial economic program with the technology base in energy technology.
COURSE CONTENT	The course provides definitions of a system and energy system and what system thinking mean, regarding energy systems development in an international context. It includes examples from different parts of the world, description of stakeholders in the energy sector on global, national, regional and local levels, and how natural science (e.g. geoscience and ecology), technological, economic and political frameworks influence the conditions for energy systems, policy instruments and development targets within the energy sector and local conditions for energy systems.

PROCESS MODELLING

COURSE CODE	ERA311
SUBJECT AREA	Energy Engineering
ECTS CREDITS	7,5
LEVEL	Graduate
STUDY PERIOD	3
COLLISION CODE	K2
LINK TO THE SYLLABUS	Process Modelling
ELIGIBILITY REQUIREMENTS	150 credits within an energy engineering program which includes 7,5 credits within Applied Thermodynamics, 7,5 credits in Heat and Mass Transfer and 7,5 credits in Mechanics of Fluids, or similar. And 22,5 credits in Mathematics/ applied mathematics where at least 7,5 credits must be Single Variable Calculus.
COURSE CONTENT	The course covers principles in model building in process engineering, theory about mathematical modelling within energy processes, analytical and numerical solutions, statistical and empirical modelling.

PROCESS SIMULATION

COURSE CODE	ERA312
SUBJECT AREA	Energy Engineering
ECTS CREDITS	7,5
LEVEL	Graduate
STUDY PERIOD	4
COLLISION CODE	K1+K3+K4
LINK TO THE SYLLABUS	Process Simulation
ELIGIBILITY REQUIREMENTS	150 credits within an energy engineering program which includes 7,5 credits within Applied Thermodynamics, 7,5 credits in Heat and Mass Transfer and 7,5 credits in Mechanics of Fluids, or similar. And 22,5 credits in Mathematics/ applied mathematics where at least 7,5 credits must be Single Variable Calculus.
COURSE CONTENT	The course covers principles in building simulation models in process engineering, use of different tools for dynamic simulation, chemical equilibrium calculations and energy and material balances for different type of problems, simulation solvers, including simultaneous and sequential solvers, model verification and validation.

PROCESS OPTIMIZATION

COURSE CODE	ERA320
SUBJECT AREA	Energy Engineering
ECTS CREDITS	7,5
LEVEL	Graduate
STUDY PERIOD	4
COLLISION CODE	K2
LINK TO THE SYLLABUS	Process Optimization
ELIGIBILITY REQUIREMENTS	150 credits within an engineering program which includes 52,5 credits from energy engineering courses, whereas 7,5 credits in Heat and Mass Transfer and 7,5 credits in Mechanics of Fluids or equivalent. Further, 7,5 credits from Applied thermodynamics and 22,5 credits in Mathematics/Applied mathematics where at least 7,5 credits must be Single Variable Calculus or equivalent
COURSE CONTENT	System modelling and iterative solution methods. Linear optimization and Simplex method. Nonlinear optimization and Lagrange multipliers. Dynamic optimization. Gradient-based optimization. Genetic algorithms. The methods are applied on energy systems including fluid machinery, thermal processes, powerplants and air transportation. The course includes hands-on software demonstrations and individual assignments.

INDUSTRIAL CHANGE: CHALLENGES AND OPPORTUNITIES

COURSE CODE	IEO302
SUBJECT AREA	Industrial Engineering and Management
ECTS CREDITS	7,5
LEVEL	Graduate
STUDY PERIOD	4
COLLISION CODE	K3
LINK TO THE SYLLABUS	Industrial Change: Challenges and Opportunities
ELIGIBILITY REQUIREMENTS	120 credits within a MSc programme of Industrial Engineering and Management, which includes 30 credits within the subject "industrial engineering and management", or comparable.
COURSE CONTENT	The course is based on an online-based lecture series together with seminars and exercises digital or in class. Learning materials and assignments are distributed and handled through the course's digital learning platform. The theoretical basis of the course mainly comes from the areas of Industrial Dynamics and Socio-technical Systems Theory with strong links to Evolutionary Economics and Institutional Economics. The knowledge of Industrial Dynamics and Systems will later be applied practically in the areas of Innovation Management and Strategic Management during the course.

MANAGING INDUSTRIAL CHANGE

COURSE CODE	IEO307
SUBJECT AREA	Industrial Engineering and Management
ECTS CREDITS	7,5
LEVEL	Graduate
STUDY PERIOD	3
COLLISION CODE	K2
LINK TO THE SYLLABUS	Managing Industrial Change
ELIGIBILITY REQUIREMENTS	120 credits within a MSc programme in Industrial Engineering and Management, which includes 30 credits within the subject "industrial engineering and management", or comparable
COURSE CONTENT	The content of the course is summarized as follows: - What is change? - Basic terminology - What needs drive change work? - Change work in perspective - past, present, future - Models of change - the individual, the group, the organization - How organizational change can be analyzed - Change management in practice - planning, organizing, leading, managing and finalizing - Problematizing change management as practice

FRESHWATER TREATMENT AND MANAGEMENT

COURSE CODE	MTK329
SUBJECT AREA	Environmental Engineering
ECTS CREDITS	7,5
LEVEL	Graduate
STUDY PERIOD	3
COLLISION CODE	Distance
LINK TO THE SYLLABUS	Freshwater Treatment and Management
ELIGIBILITY REQUIREMENTS	120 credits of which 90 credits engineering and/or natural science and 7.5 credits mathematics.
COURSE CONTENT	Freshwater management; the hydrological cycle, freshwater quality; monitoring; availability and supply; freshwater treatment technologies for production of drinking water; historical and future perspectives

SUSTAINABLE CITIES AND INFRASTRUCTURE

COURSE CODE	MTK330
SUBJECT AREA	Energy Engineering
ECTS CREDITS	7,5
LEVEL	Graduate
STUDY PERIOD	3
COLLISION CODE	Distance
LINK TO THE SYLLABUS	Sustainable Cities and Infrastructure
ELIGIBILITY REQUIREMENTS	120 credits of which 90 credits in engineering and/or natural science and 7.5 credits in mathematics.
COURSE CONTENT	The course deals with the concept of sustainable development applied to cities and infrastructures with special focus on water, energy and food aspects. The planning and management of sustainable cities and infrastructures will be also addressed in the course. Case studies of sustainable cities, communities and infrastructure will be investigated during the course.

SUSTAINABLE PRODUCTION AND CONSUMPTION

COURSE CODE	MTK331
SUBJECT AREA	Environmental Engineering
ECTS CREDITS	7,5
LEVEL	Graduate
STUDY PERIOD	4
COLLISION CODE	Distance
LINK TO THE SYLLABUS	Sustainable Production and Consumption
ELIGIBILITY REQUIREMENTS	120 credits of which 90 credits engineering and/or natural science
COURSE CONTENT	The course provides an overview of today's consumption from a historical context, including consumption categories, pattern and lifestyles and roles and responsibilities in production and consumption. Moreover, the concept of Sustainable production and consumption is discussed in the context of sustainable development and resource efficiency. Indicators are used to assess measures towards resource efficiency and sustainability.

RESOURCE RECOVERY AND SOLID WASTE MANAGEMENT

COURSE CODE	MTK332
SUBJECT AREA	Environmental Engineering
ECTS CREDITS	7,5
LEVEL	Graduate
STUDY PERIOD	4
COLLISION CODE	Distance
LINK TO THE SYLLABUS	Resource Recovery and Solid Waste Management
ELIGIBILITY REQUIREMENTS	120 credits of which 90 credits engineering and/or natural science
COURSE CONTENT	The course covers the whole value chain of solid waste management including collection, transportation, separation and treatment. The global environmental issues related with the management of certain solid wastes e.g. e-waste and plastics, are presented. The goals of the 3R´s (reduce, reuse and recycle) in preventing waste and conserve natural resources are explained and discussed as an effective concept to reach a sustainable development.

APPLIED SPECTRAL IMAGING FOR SUSTAINABLE ENGINEERING

COURSE CODE	MTK349
SUBJECT AREA	Environmental Engineering
ECTS CREDITS	7,5
LEVEL	Graduate
STUDY PERIOD	3
COLLISION CODE	Distance
LINK TO THE SYLLABUS	Applied Spectral Imaging for Sustainable Engineering
ELIGIBILITY REQUIREMENTS	120 credits including 90 credits in engineering and/or natural science, of which 15 credits on advanced level, and 7.5 credits mathematics
COURSE CONTENT	The course mainly addresses the following: - Advances and developments of spectral imaging including image processing algorithms. - Applications of spectral imaging techniques for process and environmental monitoring, control, and optimization.

PROJECT IN FUTURE ENERGY

COURSE CODE	OAH302
SUBJECT AREA	Other Subjects Within Technology
ECTS CREDITS	15
LEVEL	Graduate
STUDY PERIOD	3+4
COLLISION CODE	X
LINK TO THE SYLLABUS	Project in Future Energy
ELIGIBILITY REQUIREMENTS	180 credits completed courses related to the research profile Future Energy. Alternative, completed a project course in Energy and Environmental engineering (30 ECTS).
COURSE CONTENT	The advanced project work carried out in a current research project in Future Energy or in cooperation with industrial partner, containing current one research problem in the field. The project task contains one of the following elements: measurement / experiments and analysis of results, calculation / simulation / optimization and analysis of results, planning / design.

PROJECT IN FUTURE ENERGY

COURSE CODE	OAH303
SUBJECT AREA	Other Subjects Within Technology
ECTS CREDITS	30
LEVEL	Graduate
STUDY PERIOD	3+4
COLLISION CODE	X
LINK TO THE SYLLABUS	Project in Future Energy
ELIGIBILITY REQUIREMENTS	180 credits completed courses related to the research profile Future Energy. Alternative, completed a project course in Energy and Environmental engineering (30 ECTS).
COURSE CONTENT	The advanced project work carried out in a current research project in Future Energy or in cooperation with industrial partner, containing current research problem in the field. The project task contains one or more of the following elements: measurement / experiments and analysis of results, calculation / simulation / optimization and analysis of results, planning / design.

SCIENTIFIC MANUSCRIPT IN ENERGY AND ENVIRONMENTAL ENGINEERING – PROCESS, METHOD AND IMPLEMENTATION

COURSE CODE	OAH304
SUBJECT AREA	Other Subjects Within Technology
ECTS CREDITS	30
LEVEL	Graduate
STUDY PERIOD	3+4
COLLISION CODE	X
LINK TO THE SYLLABUS	Scientific Manuscript in Energy and Environmental Engineering - Process, Method and Implementation
ELIGIBILITY REQUIREMENTS	180 credits completed courses related to the research profile Future Energy. Alternative, completed the Project course in Energy and Environmental engineering (30 ECTS)
COURSE CONTENT	This course increases the understanding for scientific writing, and it will conduct parallel with an individual work where results from a project are included in a manuscript. In the course train the skills to write a scientific publication for a scientific journal or conference. The participants will obtain a deepened understanding of the main components in a scientific work, and the importance to describe/understand how knowledge gaps that are addressed. Based on this a clear research question, suitable methodologies, and the scientific result be presented. Finally, the course addresses various strategies on how to use discussions and conclusion parts to conclude the scientific publication.