



Programme syllabus

[An accessible version of the syllabus can be found in the Course and programme directory.](#)

Master's Programme, Industrial Engineering and Management 120 credits

Masterprogram, industriell ekonomi

Valid for students admitted to the education from autumn 12 (HT - Autumn term; VT - Spring term).

This is a translation of the Swedish, legally binding, programme syllabus.

Programme objectives

In addition to the aims specified in the Higher Education Ordinance, there are also specific objectives for this Master's programme. After completing the Master's programme the student shall...

Knowledge and understanding

- Display advanced skills in mathematics, natural sciences and technology within a chosen track (second cycle)

- Display advanced skills in industrial economics and management as well as of the relationship technology-economics-society
- Display expertise of how financial operations and their legal and institutional frameworks can be described, measured, changed and administered and demonstrate knowledge of how different types of established and new technology can support or further develop businesses
- Display expertise of established methods, models and theories within the management area to plan, follow up and lead as well as evaluate the results and quality of different types of industrial and technology-based activities
- Display expertise in management and development on the basis of and with an understanding for different stakeholders – such as: shareholders, customers, employees, society and the environment, and demonstrate insight into possible areas of conflict.
- Display expertise in scientific tools in order to analyse, process and evaluate facts, and demonstrate an awareness of how knowledge can be developed within natural sciences, technology and social sciences

Skills and abilities

- Display the ability to independently as well as in groups, be able to transform knowledge and skills into practice with regard taken to relevant scientific professional/profession-related and societal views and standpoints
- Display the ability to analyse, formulate and deal with technical problems, from a systems perspective, as well as the ability to set boundaries, decide necessary consumption of resources and to manage processes for problem solving and realisation
- Display the ability to assess whether proposed technical systems and activities contribute to the development of a sustainable society.
- Display the ability to manage personnel and activities on different organisational levels, within different types of organisational lifecycle stages, within different types of operational logics
- Display the ability to sell negotiate and act in an advisory capacity within the chosen technical track/specialisation.

Ability to make judgements and adopt a standpoint

- Possess a reflective approach to responsibility and to ethical issues within technical organisational, financial, ecological and societal systems
- Display awareness as to how one's own personal views and standpoints affect definition and assessments of technical, organisational and financial problems
- Display critical approach to established management methods, models and theories as well as how knowledge is developed within natural sciences, technology and social sciences
- KTH's local degree ordinance can be found in the KTH regulations, intra.kth.se/regelverk

Extent and content of the programme

The education comprises 120 higher education credits, which correspond to 2 years of full time study. The education is pursued at advanced level.

The following track currently exist within the Master's programme:

- Biotechnology and Industrial Engineering
- Energy Systems and Industrial Engineering
- Financial Mathematics and Industrial Engineering
- Integrated Production and Industrial Engineering
- Internetworking and Industrial Engineering
- Mechatronics and Industrial Engineering
- Program Design and Industrial Engineering
- Wireless systems and Industrial Engineering

Teaching is mainly in Swedish, certain courses and some parts of the course are taught in English. From 2012 the language of teaching will be English.

Eligibility and selection

Entry requirements to the Master's programme are a minimum of 150 higher education credits from years 1-3 including completed work towards a Bachelor's Degree within the Engineering programme Industrial Engineering and Management at KTH, or a Bachelor's Degree from an engineering programme in Industrial Engineering and Management with equivalent technology track from another higher education institution. Other studies or work experience are assessed on the basis of the actual competence invoked.

For additional information please refer to KTH's admission regulations in the KTH regulations, intra.kth.se/regelverk

Implementation of the education

Structure of the education

Structure of the education

Academic years, terms and study periods are described in the KTH regulations, intra.kth.se.

Structure of the education

The structure of the Master program is built on a 30-30-30-30 credit divide. This means that there are 30 credits of compulsory courses within the chosen technical track/specialisation, 30 credits of compulsory courses in industrial economics and management, degree project of/master thesis worth 30 credits, 7,5 credits research methodology and scientific theory and the remaining credits are elective. This allows the students to themselves influence the possibility of taking courses so they can receive a general Master degree within either their chosen technical track/specialisation or industrial economics and management.

Years 1-2 – Specialised study at advanced level

Study years 1 and 2 include courses both the subject of industrial economics, as well as one of eight (8) tracks, mainly at advanced level. In addition, integration courses focusing on technology-economics-leadership, and are included in year 1 and 2, master level, are mainly pursued at advanced level.

Apart from previously mentioned professional skills and abilities, knowledge of entrepreneurship is to be integrated in the courses during year 1 and 2, second cycle level/advanced level.

The engineers knowledge of the environment and sustainable development will be deepened and concretised through integration in the programme's courses with the special aspects of e.g. lifecycle analysis, environmental effects and choice of materials, which are features of the chosen track. Within the track the student should achieve such a depth of understanding that he/she is able carry out a degree project within the subject.

Each student must also choose conditional elective courses at advanced level in the subject Industrial Engineering and Management. The studies in Industrial Engineering and Management should result in a depth of understanding such that the student may accomplish his/her degree project within the subject.

The conditional optional courses within Industrial Engineering and Management at advanced level are within the following areas:

- Industrial Marketing
- Industrial Project Management
- Production Management
- Finance and Control

The courses and study programmes conclude with a degree project, advanced level, consisting of 30 higher education credits. In addition to this you will choose approximately 15 credits worth of elective courses within the program.

Courses

The programme is course-based. Lists of courses are included in appendix 1.

Grading system

Courses in the first and the second cycle are graded on a scale from A to F. A-E are passing grades, A is the highest grade. The grades pass (P) and fail (F) are used for courses under certain circumstances.

Conditions for participation in the programme

Term Enrolment and Course Application

A prerequisite to be allowed to participate in the studies is that the student verifies enrollment for courses the coming term every spring and fall. This is done via www.antagning.se between the 1st and 15th of November and the 1st and 15th of May.

By verifying his/her enrolment, the student has submitted his/her intention to continue studying and participating in the programme. After that it is possible for the student to:

- registered for courses
- have results reported

Conditions for participation in the programme

For studies in year 2:

A minimum of 195 credits from years 1, 2, 3 and 4, basic level. At least 45 higher education credits from year 1, advanced level, must be achieved including the re-examination period in August. Students who have not fulfilled this requirement must establish an individual study plan in consultation with the study advisor.

Recognition of previous academic studies

The student has the possibility to apply to receive credits from a course/courses studied at another university within the country or abroad. The person responsible for first-cycle courses and study programmes makes decisions on credit transfers. KTH's policy for credit transfers can be found in the KTH regulations, intra.kth.se/regulations

Studies abroad

Students of Industrial Engineering and Management have the possibility to study abroad through the agreements KTH has with universities within and outside the EU. It is also possible to do a degree project abroad.

The last date for applications for studying abroad is in the middle of January in the academic year prior to the stay abroad.

Degree project

The degree project at advanced level comprises 30 higher education credits. Degree projects can be carried out within chosen track or within the subject Industrial Engineering and Management.

KTH's rules for degree projects can be found in the KTH regulations, *intra.kth.se*. In general this means that the main part of the studies must have been completed before the degree project can be started.

Degree

In order to graduate with the Degree of Master of Science (Two Years) a pass grade must be achieved in all courses, which are included in the student's study plan. The study plan shall comprise 120 higher education credits including a degree project comprising 30 higher education credits.

KTH's local degree ordinance can be found in the KTH regulations, *intra.kth.se*

Appendix 1 - Course list

Appendix 2 - Programme syllabus descriptions



Appendix 1: Course list

Master's Programme, Industrial Engineering and Management (TIEMM)

General courses

Year 1

Conditionally elective courses

Code	Name	Credits	Edu. level
ME2017	Project Management: Leading Project-based Operations	6.0 hp	Second cycle
ME2025	Brand Portfolio Management	6.0 hp	Second cycle
ME2028	Behavioural Management Control	6.0 hp	Second cycle
ME2029	Finance	6.0 hp	Second cycle
ME2030	Finance, Corporate Valuation	6.0 hp	Second cycle
ME2033	Industrial Dynamics and Technical Change	6.0 hp	Second cycle
ME2042	Business Negotiations	6.0 hp	Second cycle
ME2053	Logistics & Supply Chain Management	6.0 hp	Second cycle
ME2054	Purchasing & Supply Chain Management	6.0 hp	Second cycle
ME2075	Leadership and Power in Industrial Organisations: Perspectives of Gender and Diversity	6.0 hp	Second cycle
ME2603	Entrepreneurship	6.0 hp	Second cycle

Year 2

Conditionally elective courses

Code	Name	Credits	Edu. level
ME2017	Project Management: Leading Project-based Operations	6.0 hp	Second cycle
ME2025	Brand Portfolio Management	6.0 hp	Second cycle
ME2028	Behavioural Management Control	6.0 hp	Second cycle
ME2029	Finance	6.0 hp	Second cycle
ME2030	Finance, Corporate Valuation	6.0 hp	Second cycle
ME2033	Industrial Dynamics and Technical Change	6.0 hp	Second cycle
ME2042	Business Negotiations	6.0 hp	Second cycle
ME2053	Logistics & Supply Chain Management	6.0 hp	Second cycle
ME2054	Purchasing & Supply Chain Management	6.0 hp	Second cycle
ME2075	Leadership and Power in Industrial Organisations: Perspectives of Gender and Diversity	6.0 hp	Second cycle
ME2603	Entrepreneurship	6.0 hp	Second cycle
ME2604	Advanced Industrial Marketing	6.0 hp	Second cycle

Track, Biotechnology and Industrial Engineering (BIIA)

Year 1

Mandatory courses (35.0 Credits)

Code	Name	Credits	Edu. level
BB2440	Bioinformatics and Biostatistics	7.0 hp	Second cycle
BB2470	Genetics and Genomics	10.0 hp	Second cycle
ME2013	Operations Management: Organization and Control	6.0 hp	Second cycle
ME2305	Management: Traditions, Theory and Trends	6.0 hp	Second cycle
ME2604	Advanced Industrial Marketing	6.0 hp	Second cycle

Conditionally elective courses

Code	Name	Credits	Edu. level
BB1120	Cultivation Technology	6.0 hp	First cycle
BB1130	Analysis and Purification of Biomolecules	7.0 hp	First cycle
BB2010	Environmental Toxicology	9.0 hp	Second cycle
BB2170	Drug Development	6.0 hp	Second cycle
BB2290	Molecular Biomedicine	7.5 hp	Second cycle
BB2450	The Cell Factory	7.5 hp	Second cycle
BB2480	Energy and Environment	7.5 hp	Second cycle
BB2510	Proteomics	6.0 hp	Second cycle

Recommended courses

Code	Name	Credits	Edu. level
KD1050	Chemical Thermodynamics	6.0 hp	First cycle

Year 2

Mandatory courses (28.5 Credits)

Code	Name	Credits	Edu. level
ME2001	Research Methods in Industrial Engineering and Management	7.5 hp	Second cycle
ME2304	Management in Technology Intensive Organisations	6.0 hp	Second cycle
ME2310	Biotechnology - Business - Leadership	15.0 hp	Second cycle

Track, Energy Systems and Industrial Engineering (ESIA)

Year 1

Mandatory courses (49.5 Credits)

Code	Name	Credits	Edu. level
EG2050	System Planning	7.5 hp	Second cycle
ME2013	Operations Management: Organization and Control	6.0 hp	Second cycle
ME2305	Management: Traditions, Theory and Trends	6.0 hp	Second cycle
ME2603	Entrepreneurship	6.0 hp	Second cycle
ME2604	Advanced Industrial Marketing	6.0 hp	Second cycle
MJ2141	Energy Systems, Models and Scenarios	9.0 hp	Second cycle
MJ2407	Sustainable Energy Utilisation	9.0 hp	Second cycle

Year 2

Mandatory courses (25.5 Credits)

Code	Name	Credits	Edu. level
ME2001	Research Methods in Industrial Engineering and Management	7.5 hp	Second cycle
ME2304	Management in Technology Intensive Organisations	6.0 hp	Second cycle
MJ2145	Energy Systems - Business - Leadership	12.0 hp	Second cycle

Track, Financial Mathematics and Industrial Engineering (FMIA)

Year 1

Mandatory courses (46.5 Credits)

Code	Name	Credits	Edu. level
ME2013	Operations Management: Organization and Control	6.0 hp	Second cycle
ME2031	Behavioural Finance	6.0 hp	Second cycle
ME2305	Management: Traditions, Theory and Trends	6.0 hp	Second cycle
ME2604	Advanced Industrial Marketing	6.0 hp	Second cycle
SF2940	Probability Theory	7.5 hp	Second cycle
SF2950	Applied Mathematical Statistics	7.5 hp	Second cycle
SF2980	Risk Management	7.5 hp	Second cycle

Recommended courses

Code	Name	Credits	Edu. level
ME2030	Finance, Corporate Valuation	6.0 hp	Second cycle
SF2970	Martingales and Stochastic Integrals	6.0 hp	Second cycle
SF2975	Financial Derivatives	7.5 hp	Second cycle

Year 2

Mandatory courses (25.5 Credits)

Code	Name	Credits	Edu. level
ME2001	Research Methods in Industrial Engineering and Management	7.5 hp	Second cycle
ME2304	Management in Technology Intensive Organisations	6.0 hp	Second cycle
ME2308	Finance - Mathematics - Business Management	12.0 hp	Second cycle

Track, Integrated Production and Industrial Engineering (IPIA)

Year 1

Mandatory courses (36.0 Credits)

Code	Name	Credits	Edu. level
ME2305	Management: Traditions, Theory and Trends	6.0 hp	Second cycle
ME2603	Entrepreneurship	6.0 hp	Second cycle
ME2604	Advanced Industrial Marketing	6.0 hp	Second cycle
MG2019	Integrated Production	12.0 hp	Second cycle
MG2033	Quality Control	6.0 hp	Second cycle

Year 2

Mandatory courses (25.5 Credits)

Code	Name	Credits	Edu. level
ME2001	Research Methods in Industrial Engineering and Management	7.5 hp	Second cycle
ME2304	Management in Technology Intensive Organisations	6.0 hp	Second cycle
MG2017	Production - Business - Leadership	12.0 hp	Second cycle

Track, Internetworking and Industrial Engineering (ITIA)

Year 1

Mandatory courses (40.5 Credits)

Code	Name	Credits	Edu. level
IK2206	Internet Security and Privacy	7.5 hp	Second cycle
IK2215	Advanced Internetworking	7.5 hp	Second cycle
IK2217	Advanced Internetworking II	7.5 hp	Second cycle
ME2013	Operations Management: Organization and Control	6.0 hp	Second cycle
ME2305	Management: Traditions, Theory and Trends	6.0 hp	Second cycle
ME2604	Advanced Industrial Marketing	6.0 hp	Second cycle

Year 2

Mandatory courses (28.5 Credits)

Code	Name	Credits	Edu. level
IK2203	Communication - Business - Leadership	15.0 hp	Second cycle
ME2001	Research Methods in Industrial Engineering and Management	7.5 hp	Second cycle
ME2304	Management in Technology Intensive Organisations	6.0 hp	Second cycle

Track, Mechatronics and Industrial Engineering (MEIA)

Year 1

Mandatory courses (30.0 Credits)

Code	Name	Credits	Edu. level
ME2013	Operations Management: Organization and Control	6.0 hp	Second cycle
ME2305	Management: Traditions, Theory and Trends	6.0 hp	Second cycle
ME2604	Advanced Industrial Marketing	6.0 hp	Second cycle
MF2030	Mechatronics basic Course	6.0 hp	Second cycle
MF2042	Embedded Systems for Mechatronics, I	6.0 hp	Second cycle

Conditionally elective courses

Code	Name	Credits	Edu. level
MF2007	Dynamics and Motion Control	9.0 hp	Second cycle
MF2044	Embedded Systems for Mechatronics, II	6.0 hp	Second cycle

Year 2

Mandatory courses (28.5 Credits)

Code	Name	Credits	Edu. level
ME2001	Research Methods in Industrial Engineering and Management	7.5 hp	Second cycle
ME2304	Management in Technology Intensive Organisations	6.0 hp	Second cycle
MF2050	Mechatronics, Business and Management	15.0 hp	Second cycle

Track, Program Design and Industrial Engineering (PDIA)

Year 1

Mandatory courses (42.0 Credits)

Code	Name	Credits	Edu. level
DD2390	Internet Programming	6.0 hp	Second cycle
DH2408	Evaluation Methods in Human-Computer Interaction	6.0 hp	Second cycle
DH2622	Human-Computer Interaction, Advanced Course with Prototyping	9.0 hp	Second cycle
DH2632	Human-Computer Interaction, Research Seminars	3.0 hp	Second cycle
ME2013	Operations Management: Organization and Control	6.0 hp	Second cycle
ME2305	Management: Traditions, Theory and Trends	6.0 hp	Second cycle
ME2604	Advanced Industrial Marketing	6.0 hp	Second cycle

Year 2

Mandatory courses (25.5 Credits)

Code	Name	Credits	Edu. level
DH2460	Software Design - Business - Leadership	12.0 hp	Second cycle
ME2001	Research Methods in Industrial Engineering and Management	7.5 hp	Second cycle
ME2304	Management in Technology Intensive Organisations	6.0 hp	Second cycle

Track, Wireless Systems and Industrial Engineering (TSIA)

Year 1

Mandatory courses (33.0 Credits)

Code	Name	Credits	Edu. level
EP2200	Queuing Theory and Teletraffic Systems	7.5 hp	Second cycle
EQ2300	Digital Signal Processing	7.5 hp	Second cycle
ME2013	Operations Management: Organization and Control	6.0 hp	Second cycle
ME2305	Management: Traditions, Theory and Trends	6.0 hp	Second cycle
ME2604	Advanced Industrial Marketing	6.0 hp	Second cycle

Recommended courses

Code	Name	Credits	Edu. level
EN2300	Speech Signal Processing	6.0 hp	Second cycle
EN2401	Image and Video Processing	6.0 hp	Second cycle
EP2120	Internetworking	7.5 hp	Second cycle
EQ2400	Adaptive Signal Processing	6.0 hp	Second cycle
EQ2410	Advanced Digital Communications	6.0 hp	Second cycle

Year 2

Mandatory courses (28.5 Credits)

Code	Name	Credits	Edu. level
EQ2435	Wireless Communication-Business-Leadership	15.0 hp	Second cycle
ME2001	Research Methods in Industrial Engineering and Management	7.5 hp	Second cycle
ME2304	Management in Technology Intensive Organisations	6.0 hp	Second cycle



Appendix 2: Specialisations

Master's Programme, Industrial Engineering and Management (TIEMM)

Track, Biotechnology and Industrial Engineering (BIIA)

No information entered.

Track, Energy Systems and Industrial Engineering (ESIA)

No information entered.

Track, Financial Mathematics and Industrial Engineering (FMIA)

No information entered.

Track, Integrated Production and Industrial Engineering (IPIA)

No information entered.

Track, Internetworking and Industrial Engineering (ITIA)

No information entered.

Track, Mechatronics and Industrial Engineering (MEIA)

No information entered.

Track, Program Design and Industrial Engineering (PDIA)

No information entered.

Track, Wireless Systems and Industrial Engineering (TSIA)

No information entered.