IM23SP Bachelor Degree Programme in Industrial Management (IM23SP)

Credits
240

Duration (years)
4

Language
English

Specifications

Degree
Bachelor of Engineering

Degree title
Bachelor of Engineering

Degree programme
Degree Programme in Industrial Management

Type of education
Bachelor’s degrees, full-time study

Person in charge
Mirka Savolainen

Description

Description
The degree programme in Industrial Management leads to a bachelor's degree, the title of the degree is Bachelor of Engineering in Industrial Management. The scope of the studies is 240 ECTS credits and the duration is 4 years. The competences produced by the degree correspond to the level of higher education commonly defined in the European Union, which enables the mobility of the workforce and experts.

Industrial management studies are carried out from the point of view of professional development upwards step by step, and working life projects are already done from the beginning of the studies. Studies begin with studying natural sciences and information technology. After this, the key competence areas of industrial management and the basics of selected technical fields are focused on. The degree program produces and qualifies engineers for various positions in technology industry most probably operating also internationally. Duties may be, for example, in engineering, business and management, projects, sales or in operations and supply chain management.

Curriculum development and working life cooperation

In Savonia, the pedagogical starting point is a diverse combination of high quality and working life-oriented education and research and development activities. Co-development strengthens multidisciplinary activities, utilization of partnerships and closeness to working life.

Education close to working life emphasizes students' motivation and commitment to their studies. A variety of virtual and physical environments in Savonia and in partner organizations' facilities both at home and abroad connect theory and practice in an extensive and interesting way as part of the student's learning and also the development of organizations. The education is characterized by multiformity, multidisciplinary approach and it is not bound to time and place.

With comprehensive guidance, the student's professional growth is supported throughout the study path. In Savonia, every student is an individual. The training is carried out taking into account the different needs and goals of the students. Personalized education enables alternative methods of performance and individual paths according to the student's own goals.

In Savonia, the recognition of prior learning and the studification of work are used as part of the student's personal study plan when applicable. Students can deepen or expand their skills by utilizing the offerings of Savonia's national and international higher education partners.

Responsibility, sustainable development and global human security challenges are taken into account in the contents and implementation methods of the annual themes and courses.

In industrial management education, teaching mainly takes place on campus, also utilizing business cooperation through industrial visits and visiting lecturers. The learning tasks are often case studies that come commissioned by the surrounding industry and companies.

Objectives
In Savonia's curricula, the courses form broader study units. In this way, they support the overall development of the student and the development of expertise. At the same time, it becomes possible to combine teaching and working life-oriented research and development activities.

The curriculum for an Industrial Management engineer is designed so that
• the degree produces the skills required in working life
• training ensures the development of the student's expertise.

Student
• prepares a personal study plan to support his/her studies, where previously acquired competence is recognized
• is responsible for the progress of his/her studies.

Savonia's teachers and other personnel guide and support in defining and achieving personal goals.

The bachelor programme in Industrial Management at Savonia UAS aims at educating future engineering experts to become strong in industrial management as well as in chosen technology fields. Students are encouraged to develop their expertise step by step; from basics and introduction to deepening and applying the gained knowledge into practice in working life.

Code	Name	Sum

IM23SP	IM23SP Bachelor Degree Programme in Industrial Management	240
IM23SP-1001	**BASIC STUDIES**	**60**
IM23SP-1005	**Basic Studies**	**60**
IM00BD21	Tools for International Engineering Students	5
4_EXX8110	Mathematics 1	5
IM00BD22	Leadership and Teamwork	5
4_EIP8010	Technical Drawing	5
IM00BD23	Basics of Programming	5
IM23SP-1009	Finnish or Swedish	5
IX00BF80	Basics of Finnish	5
4_EXX8060	Engineering Swedish	5
4_EXX8140	Physics for Engineering	5
4_EXX8120	Mathematics 2	5
4_EIP8030	Office Applications	5
IM00BD26	Communication Skills for Engineering Students	5
IM00BD28	Orientation Project	5
IM00BF26	Physics for Industrial Engineering	5
IM23SP-1002	**PROFESSIONAL STUDIES**	**120**
IM23SP-1006	**Professional Studies**	**120**
4_EIP8040	Manufacturing Technology 1	5
IM00BG62	Industrial IoT	5
4_EXX8130	Mathematics 3	5
4_EIA8010	Material Technology 1	5
IM00BD32	Sustainability in Technology Industry	5
4_EFA8040	Data Management and SQL	5
IM00BD33	Basics of Energy Technology	5
IM00BD29	Communication Skills for Engineering Experts	5
4_EIA8060	Basics of Electrical Engineering	5
IM00BD30	Basics of Supply Chain Management	5
IM00BD31	RDI Project	5
IM00BG61	Operations Management	5
IM00BG54	Management Accounting	5
IE00BD87	Quality Management	5
IM00BD36	Industrial Product and Service Marketing	5
4_EIA8180	Manufacturing Systems Development	5
IM00BG58	Procurement and Purchasing Management	5
IM00BG56	Industrial Management Project 1	5
IM00BG55	Project Management Tools	5

4_EIA8220	Data Management and ERP	5
IE00BD52	Supply chain and Network Management	5
IM00BD37	Delivery Project Management	5
IM00BD38	Sales Management	5
IM00BG57	Industrial Management Project 2	5
IM23SP-1003	**ELECTIVE STUDIES**	**15**
IM23SP-1007	**Elective Studies**	**15**
IM23SP-1004	**INTERNSHIP**	**30**
IM23SP-1008		**30**
EX00BD39	Internship 1	5
EX00BD40	Internship 2a	5
EX00BD41	Internship 2b	5
EX00BD42	Internship 3a	5
EX00BD43	Internship 3b	5
EX00BD44	Internship 3c	5
THESIS	**THESIS**	**15**
THESIS-1001	**Thesis**	**15**
XT00BA53	Thesis Planning	5
XT00BA54	Thesis Implementation	5
XT00BA55	Thesis Finalisation	5
XT00BA56	Maturity Test	0

IM23SP IM23SP Bachelor Degree Programme in Industrial Management: 240 op

IM23SP-1001 Basic Studies: 60 op

Optionality
All compulsory

IM23SP-1005 Basic Studies: 60 op

Optionality
All compulsory

IM00BD21 Tools for International Engineering Students: 5 op

Credits
5 - 5

Objectives
After completing the course the student is able to
- plan his/her studies and use the information, counselling and guidance services available in

Savonia UAS
- find support when needed in order to progress with the studies according to schedules
- evaluate and develop his/ her studying skills
- use the necessary IT tools and applications in his/her studies
- communicate, work and study in a multicultural environment

Content
- Orientation to UAS studies
- IT applications and skills in engineering studies
- Communication and grouping in a multicultural community

Assessment scale
Five step scale

4_EXX8110 Mathematics 1: 5 op

Credits
5 - 5

Objectives
The student revises the basics of algebra and trigonometry. He/she knows the basic properties of the most common functions used in technical applications. The student learns the elements of mathematical thinking and deduction. Furthermore, the student is able to recognize simple mathematical problems and solve them. The student achieves the readiness required to continue studying mathematics and to solve mathematical problems in engineering studies.

Content
- Laws of algebra of real numbers
- Equations and inequalities
- Linear systems of equations
- Trigonometry
- Elementary functions

IM00BD22 Leadership and Teamwork: 5 op

Credits
5 - 5

Objectives
After completing the course, the student is able to:
- identify the meaning and value of good leadership
- define different types of teams and what makes a high performing team
- analyze the importance of self-leadership
- define and resolve team conflict and dysfunction

Content
Leadership in multicultural business environment. Self-leadership and motivation. Teamwork from different perspectives.

Assessment scale
Five step scale

4_EIP8010 Technical Drawing: 5 op

Credits
5 - 5

Objectives
The student knows the basics of technical drawing, projections used in technical drawing, the markings and symbols, part and assembly drawings, parts lists, tolerances in machine design and machine parts modeling and drawing processes. The student also gets an understanding of the different machine construction documents, parts manufacturing drawings, assembly drawings, PI-diagrams, piping and layout drawings. The student gets acquainted with the three-dimensional parametric design tool for creating the assembly and part drawings. The basics in level and space geometry and geometrical constructions are covered.

Content
Basics in technical drawing
Scales, projections, sections views, line widths, texts, dimensioning methods, tolerances, fits, surface and welding symbols, diagrams and bill of materials
Part and assembly drawings and their link to product structures
Taking manufacturing into account when creating technical drawings (welding and milling assembly drawings)
Using a CAD program to create manufacturing drawings
Standards used in technical drawing
Level and space geometry
Geometrical constructions

Prerequisites
None

IM00BD23 Basics of Programming: 5 op

Credits
5 - 5

Objectives
After completing the course, the student will be able to
- understand basic concepts of programming
- implement programs by given requirements
- use debugger on error tracking
- use 3rd party libraries
- use language and library documentation

Content
Variables
- If-elif-else statements
- While statements

- Switch statements
- For statement
- Random numbers
- Functions (no recursion)
- Collections
- File handling
- Elementary OOP

Prerequisites
-

Assessment scale
Five step scale

IM23SP-1009 Finnish or Swedish: 5 op

Optionality
Select one

IX00BF80 Basics of Finnish: 5 op

Credits
5 - 5

Objectives
After completing this course, the student is able to
- use familiar everyday expressions and basic phrases
- introduce him/herself and others
- ask and answer simple questions
- interact orally in a simple way.

Content
Topics: getting to know each other, greetings, days of the week, numbers, countries, languages, weather, seasons, family, appearance, clock, apartment, traveling.

Grammar: personal pronouns, verb to be, change of consonants (KPT), types of verbs, questions, nominative plural, genitive, partitive, locatives.

Assessment scale
Five step scale

4_EXX8060 Engineering Swedish: 5 op

Credits
5 - 5

4_EXX8140 Physics for Engineering: 5 op

Credits

5 - 5

Objectives
The general objective of the course is the introduction to the basic methods of physics. This includes the use of the SI system of units and a systematic mathematical way of analyzing physical systems.

The more specific topics of the course are the basics of temperature and thermal energy, and the Newtonian mechanics. The former includes phenomena like thermal expansion of solids, liquids and that of gases within the framework of the ideal-gas law. The student will also get to understand the energetics of the temperature changes and phase transitions.

The Newtonian mechanics is preceded by treatment of kinematics in one and two dimensions. Newtonian mechanics is about the Newton's laws and the student will learn to apply them to fairly simple systems in one and two dimensions. The student will learn to make use of the concepts related to the definition of work done by a force, i.e. energy, energy principle, and power. After having completed the course, the student is able to apply the conservation law of linear momentum for collisions. He/she will also learn to treat impulsive forces in terms of impulse of a force.

Finally the student will learn dynamics of circular motion.

Content
International System of Units (SI)
Thermal Expansion
Thermal Energy
Ideal Gas Law
Mechanisms of Heat Transfer
Kinematics
Newton's Laws
Friction
Work, Energy, and Power
Linear Momentum
Circular Motion

Prerequisites
None

4_EXX8120 Mathematics 2: 5 op

Credits
5 - 5

Objectives
The student understands the meanings of the derivative of a function and the integral of a function. He/she knows the rules of differentiation and integration. The student is also able to apply the concepts introduced during the course in engineering applications.

Content
-Differential calculus

-Integral calculus

Prerequisites
Mathematics 1

4_EIP8030 Office Applications: 5 op

Credits
5 - 5

Objectives
The student can create text documents, presentations and spreadsheet computations needed in learning of various subjects.

Content
Short review on basics of word processing (writing documents, including pictures in documents, using and modifying styles of documents, using spell checking, hyphenation, table of contents etc.).

Presentation graphics (editing texts and templates, styles, presentation settings, printing possibilities).

Basics of spreadsheet computing, formatting cells, absolute and relative reference, naming the cells, functions, charts, trend lines, printing, links, lists, sorting and filtering data, pivot tables, array functions, macros, importing data.

Further information
Passed grades from 1 to 5. The grade of the course comes from exercises returned to Moodle (25%) and an exam (75%). Limit of passing the exam is 40% of exam max points

Prerequisites
No prerequisites, Basic use of computers

IM00BD26 Communication Skills for Engineering Students: 5 op

Credits
5 - 5

Objectives
After completing the course, the student is able to:

- Communicate in different spoken and written contexts related to engineering studies
- Read, write, listen and talk in English about topics related to the student’s engineering field
- Use grammatical structures typical in the context of the study field
- Follow Savonia reporting practices concerning the academic reporting language, reference techniques and the use of the reporting template
- Search information for study purposes and evaluate information sources critically
- Understand job application process and create a CV and a job application message
- Interact and collaborate in an intercultural context

Content
- Oral and written communication related to the engineering studies
- Engineering vocabulary and terminology
- Technical texts and related grammatical structures
- Product and process descriptions
- Job application process and documents
- Presentation skills
- Academic and technical reporting with focus on Savonia reporting practices
- Critical Information retrieval

Further information
It is recommended to do the course 'Orientation Project' at the same time with this course. Some tasks may be linked to the project course.

IM00BD28 Orientation Project: 5 op

Credits
5 - 5

Objectives
After completing the course, the student is able to
- use natural science studies in practical work in industrial engineering
- use project-based learning as method of studying
- work independently and in a project group or team
- explain a product and service development process and functions and operations of an industrial company

Content
- project management and documentation
- use of information technology
- basics of general studies
- basics of program-specific studies

Further information
It is recommended that the course Communication Skills for Engineering students is studied at the same time.

Assessment scale
Five step scale

IM00BF26 Physics for Industrial Engineering: 5 op

Credits
5 - 5

Objectives
After finishing this section the student understands the concepts of
- electric field, potential and voltage
- a resistor, a capacitor and voltage supply as electrical circuit components.

- will be able to apply these concepts in the calculation of simple DC circuits.

The student understands the concept of
- magnetic field and is able to apply magnetic force influence on a conductor or a current loop in a magnetic field
- electromagnetic induction and the operation principles of an electrical motor and generator.

The student can use basic meters and can make simple experiments and report the results.
The student knows the basics of the electrical safety and is able to operate electrical equipment safely.

Content
- Electrostatics
- Electric field, electric potential, capacitors and dielectrics, current, resistance and power.
- Magnetic field: Electromagnetic induction, alternating current.
- Electric motors and generators

Prerequisites
Physics for Engineering

Assessment scale
Five step scale

IM23SP-1002 Professional Studies: 120 op

Optionality
All compulsory

IM23SP-1006 Professional Studies: 120 op

Optionality
All compulsory

4_EIP8040 Manufacturing Technology 1: 5 op

Credits
5 - 5

Objectives
The students get familiar with machine and metal industry’s production methods, their principles and production equipment. The students understand the purpose of different manufacturing processes and know the products manufactured with the different processes. The students know the achieved accuracies and surface roughness through different manufacturing processes, and understand the factors related to the chosen manufacturing method. The students become familiar with the basic structure of CNC-machines and their programming. The students understand the importance of measuring and assembly technologies in the manufacturing of machine components.

Content
Casting techniques

Shape manufacturing methods
Powder metallurgical manufacturing methods
Sheet metal and joining technology
Cutting manufacturing methods
Basics of numerical control
Cutting production methods
Measurements in engineering technology
Assembly and installation

IM00BG62 Industrial IoT: 5 op

Credits
5 - 5

Objectives
This course provides fundamental knowledge on the Internet of Things Ecosystems and how each ecosystem element is connected together. During this course, students will learn about the ecosystem of the Internet of Things (IoT) and how IoT will dramatically transform manufacturing, health, energy, agriculture, transportation, and other industrial sectors of the economy using novel interactions between humans and machines.

Content
-Introduction to Internet of Things
-Societal Applications of IoT
-Basics of Embedded Systems
-Basic Concept of Sensors and Systems
-IoT Circuit, Connectivity and Networking
-Industrial IoT framework
-Internet of Things for Manufacturing
-Software Development Life Cycle for IoT
-Some IoT Case Studies

4_EXX8130 Mathematics 3: 5 op

Credits
5 - 5

Objectives
The student can solve the most common differential equations and is able to apply them in engineering applications. The student is able to use classical probability and the most common distributions to model random events. He/she knows the basics of statistical inference and hypothesis testing.

Content
- Differential equations: separable equation, first order linear equation, second order linear equation
- Combinatorics and probability
- Random variable and distribution
- Discrete and continuous distribution

- Parameter estimation and statistical tests

Prerequisites
Mathematics 1, Mathematics 2

4_EIA8010 Material Technology 1: 5 op

Credits
5 - 5

Objectives
The aim of this course is that students get familiar with the most used materials in mechanical engineering, especially steels. Other materials discussed are cast iron and nonferrous metals. With different structural materials the scope is to understand mechanical properties of metals, manufacturing routes and service conditions subject to composition and internal structures of metals. These can be affected by heat treatment and degree of deformation. The fundamentals of material selection and fracture mechanics are also explored.

Within this study module also corrosion of materials, which is closely related to reduction-oxidation reactions as well as electrochemistry, is covered. During this study module students will take part in practical training in the laboratory of material technology.

Content
Material groups and manufacturing of metals
Internal structures of metals and its influence on properties of materials
Mechanical properties, definition within different ways
Effect of heat treatment and environmental factors
Different steel grades with their mechanical and corrosion properties and their weldability
Cast irons and nonferrous metals
Fundamentals of materials selection and fracture mechanics
Corrosion of materials
Reduction-oxidation reactions
Electrochemistry

IM00BD32 Sustainability in Technology Industry: 5 op

Credits
5 - 5

Objectives
After taking this course, the student
- knows the basic concepts of service-dominant logic
- knows the concept of sustainable development
- has an overall view of the flows of matter in ecosystems
- can classify various natural resources
- knows various opportunities for solid waste management and circular economy
- knows various traffic driving powers
- knows the operational principles of the most essential flue gas cleaning technologies
- can assess the environmental effects of product's life cycle at a rough level

- takes sustainability into account in service-dominant business within technology industry

Content
- Service-dominant logic and sustainability
- Sustainable development
- Circulation of matter in ecosystems
- Natural resources
- Waste management and circular economy
- Traffic driving powers
- Flue gas cleaning technologies
- Product life cycle and carbon footprint

Assessment scale
Five step scale

4_EFA8040 Data Management and SQL: 5 op

Credits
5 - 5

Objectives
You understand principles of relational database design and their mechanics
You are familiar with Database Management Systems and areas of usage
You are able to create database design diagrams and implement them to real databases
You are able to use graphical and shell based Database Management Systems
You are able to utilize databases as part of information system

Content
Data management concepts
Designing relational databases
Concept analysis and Entity Relationship-diagrams (ER-diagrams)
Data models
Basics of SQL language
Database Management Systems (eg. MariaDB)
Steps to database based application development

IM00BD33 Basics of Energy Technology: 5 op

Credits
5 - 5

Objectives
During the study module (course) student becames familiar with different forms of energy, energy production, energy transfer, energy consumption and energy costs.
Student knows how to handle, analyse and report mesurements and the results obtained from them.

Content
Energy sources
Different forms of energy, energy production, energy transfer, energy consumption

Principles of energy production plants operations for example back-pressure steam plant, hydropower, wind power, solar power and many other ways of producing energy
Finland's energy supply and energy security
Energy needs of industry and energy saving opportunities
Fuel analysis (moisture content, calorific values and ash content)
Flue gas measuremets in duct or stack (FTIR analyser)
Occupational Safety Card Training

Further information
Students can follow their own progress in real time in the Moodle online learning platform's grade book.

Assessment scale
Five step scale

Assessment criteria

Assessment criteria - satisfactory (1-2)
45 % of Moodle learning platform's online assignments and online exams completed equals the grade 1.
55 % of Moodle learning platform's online assignments and online exams completed equals the grade 2.

Assessment criteria - good (3-4)
65 % of Moodle learning platform's online assignments and online exams completed equals the grade 3.
75 % of Moodle learning platform's online assignments and online exams completed equals the grade 4.

Assessment criteria - excellent (5)
85 % of Moodle learning platform's online training assignments and online exams completed equals the grade 5.

Assessment criteria - approved/failed
Group work assignments (fuel analysis and flue gas measurement) with reporting evaluated using the scale accepted/fail.

IM00BD29 Communication Skills for Engineering Experts: 5 op

Credits
5 - 5

Objectives
After completing the course, the student is able to:

- Communicate in different spoken and written contexts related to intercultural working life, e.g. in projects
- Make the difference between different communication styles, and e.g. produce formal and informal

messages
- Participate in meetings and negotiations in different roles and create related documents
- Develop documents needed in job application further and participate in job interviews
- Plan and give professional presentations on various technical topics
- Make summaries and reports following Savonia reporting guidelines
- Recognize how to develop one’s skills further and give feedback to others

Content
- Communication skills in work-related situations
- Corporate communication
- Business writing and styles
- Presentation skills
- Meeting skills
- Negotiation skills
- Job application process
- Job interviews
- Reporting
- Project communication

Further information
It is recommended to do this course with a project course running at the same time.

Assessment scale
Five step scale

4_EIA8060 Basics of Electrical Engineering: 5 op

Credits
5 - 5

Objectives
The 2 ECTS section of physics included in this course is an introduction to electromagnetism. After finishing this section the student understands the concepts of electric field, potential and voltage and will be able to apply these concepts in the calculation of simple DC circuits. The student knows the operation principles of a resistor, a capacitor and voltage supply as electrical circuit components. In addition, the student understands the concept of magnetic field and is able to apply magnetic force influence on a conductor or a current loop in a magnetic field. Based on these concepts the student understands the concept of electromagnetic induction and the operation principles of an electrical motor and generator.

After completing the 3 ECTS section of electrical engineering the student is able to make simple AC circuit analysis calculations. The student knows the basics of the electrical safety and is able to operate electrical equipment safely. The student knows the operation principle of the transformer as well as the most common electrical motor types. The student knows the main criteria for electrical device rating and is able to select protective devices for an electrical drive.

Content
PHYSICS
Electric field

Potential
DC circuits
Magnetic field
Electromagnetic induction

ELECTRICAL ENGINEERING
Legislation on the electrical safety
Legislation on the electrical competency, laymen vs. professionals
Electrical installation work permitted to everyone
Electrical installation work permitted only to the licensed professionals
EC directive on machinery, electrical systems as a part of machine
The basics of AC circuits analysis
- Alternating voltage and current, phase shift
- Active, reactive and apparent power, power factor
- 3-phase system operation and calculation principles
Transformer
Electrical motor
Electrical system dimensioning and protection principles
Frequency converter
Laboratory exercises

IM00BD30 Basics of Supply Chain Management: 5 op

Credits
5 - 5

Objectives
After completing the course, the student is able to:
- identify the supply chain process
- define what supply chain management includes and how company’s logistics processes are formed
- apply the knowledge of internal material flow in a company

Content
Supply chain strategy. Supply chain process and integration of logistics. Business logistics and its objectives. Facility Layout Planning. Modern manufacturing philosophies. Warehousing.

Assessment scale
Five step scale

IM00BD31 RDI Project: 5 op

Credits
5 - 5

Objectives
After completing the course student is able to
- define product and service development processes and workflow

- explain product development, production, services and their interconnection
- work in a multidisciplinary development group or team
- understand the use of computer-aided programs in industrial engineering
- produce project documentation using a variety of techniques and tools

Content
- product and service development processes
- application of general studies
- working in a multidisciplinary environment, projects and teams
- systems, tools, methods and data management in different operations and resource planning
- communication and presentation skills and techniques

Prerequisites
Orientation project

Assessment scale
Five step scale

IM00BG61 Operations Management: 5 op

Credits
5 - 5

Objectives
After completing the course, the student is able to:

- identify production systems in industrial processes and services

- describe the factors influencing on well functioning operations

Content
Production goals and strategy. Productivity.Production planning, forecasting and scheduling. Work measurement and improvement.

Assessment scale
Five step scale

IM00BG54 Management Accounting: 5 op

Credits
5 - 5

Objectives
After completing the course, the student
- understands the operations of an industrial company from the economic point of view
- understands the role of management accounting in decision-making
- can classify costs in various ways
- can do cost-volume-profit analysis
- can do cost accounting per product

- understands how operational decisions affect the company's profitability, solvency and liquidity
- understands income statement and balance sheet and can analyze them
- can do investment calculations

Content
The link between a real process and monetary process
The role of accounting in decision-making
The behavior of costs
Cost-volume-profit analysis
Cost accounting per product
Income statement and balance sheet
Financial statement analysis: profitability, solvency and liquidity
Investment calculations
Challenges faced by companies operating in an international environment

Assessment scale
Five step scale

IE00BD87 Quality Management: 5 op

Credits
5 - 5

Objectives
After completing the course, the student is able to:

- define the meaning of quality in industrial engineering

- explain the importance of quality management

Content
Basics of quality and quality strategy. Quality Management Systems and standards. Quality Audit.

Assessment scale
Five step scale

IM00BD36 Industrial Product and Service Marketing: 5 op

Credits
5 - 5

Objectives
After completing the course the student is able to:
- define the dimensions of quality according to service-oriented logic
- recognize the differences between the basics of product- and service-oriented logic
- apply service dominant logic thinking in work and industrial operations

Content
Industrial service systems. Product- and service-dominant logic. Value dimensions in industry.

Digitalization. Networking. Marketing.

Assessment scale
Five step scale

4_EIA8180 Manufacturing Systems Development: 5 op

Credits
5 - 5

Objectives
The goal of this course is to provide the students the competences of plant managers and tools to implement the agile paradigms from mass customizing unique products for individual customers or niche markets to manufacturing products to-order quickly and cost effectively in flexible environment. The students learn how to manage variety, customize products quickly and easily, and how to develop production systems to JIT, TOC, LEAN and agile manufacturing according to production strategy.

In order to develop production systems in practice one needs to have competence to analyze, evaluate, design and implement systems for production in factories and service industries.

One also needs to understand the need for strategic fit and improvement in different situations.

Content
Production and manufacturing philosophies
Just In Time
Theory of Constraints
LEAN Production and Management, Kaizen and 5S
Mass Customization, Modular and Agile Product
Manufacturing System Design and Decomposition (MSDD)
LAYOUT specialties for different manufacturing systems
Performance Measuring and Analyzing Tools
Simulations and work improvement methods

Prerequisites
Basic knowledge of business economics, procurement management, operations management and materials management.

IM00BG58 Procurement and Purchasing Management: 5 op

Credits
5 - 5

Objectives
After completing the course, the student is able to:
- identify the role of purchasing in value chain
- define procurement process as part of organization’s supply chain

Content

Procurement management. Purchasing management process. Suppliers and network. Contracts and negotiations. Public procurement. Sustainability.

Assessment scale
Five step scale

IM00BG56 Industrial Management Project 1: 5 op

Credits
5 - 5

Objectives
After completing the course, the student
- has got experience from project work within authentic industrial case in a multinational team
- has learnt teamwork and communication in a hands-on way
- has got experience of independent working and showing initiative as well as of being in charge
- is able to apply industrial management knowledge into practice and search for new information

Content
Case selection and team formation
Kick-off meeting with the company
Project planning
Project plan presentation in a seminar
Project execution in co-operation with the company
Project reporting
Project report presentation in a seminar
Closure meeting with the company
Project evaluation

Assessment scale
Five step scale

IM00BG55 Project Management Tools: 5 op

Credits
5 - 5

Objectives
After completing the course, the student
- is able to use project management tools
- knows how to create a project schedule and manage a project in an effective way using appropriate tools
- knows the basics of project management

Content
Basic use of a selected project management software:
- creating a new project
- filling in the basic information
- user interface and views

- work breakdown structure
- resourcing
- cost control
- tracking the project
- reporting

Familiarization with other project management software

The basics of project management

Assessment scale
Five step scale

4_EIA8220 Data Management and ERP: 5 op

Credits
5 - 5

Objectives
The student understands the basic software architecture and how an ERP system uses the data that is needed in current business life. Also the student understands how the data model is designed and organized in the database.

The student understands the basic ERP system architecture and why this kind of software is needed. The student knows the main modules of the ERP system and the importance of them. The student can use the ERP system in a way it is used in daily business.

Content
Software (ERP) Projects

Data Design
Database
Forms
Reports

Use of ERP System
Logging
Basic data (company info, currencies, …)
Materials
Customers
Production
Purchasing
Storage
Shipping
Accounting

IE00BD52 Supply chain and Network Management: 5 op

Credits
5 - 5

Objectives
After completing the course, the student is able to:

- understand cooperation strategies

- identify and analyze supply chain process from networking point of view

- implement modern business cooperation networks

Content
Networking as a business strategy. Expediting, controlling and auditing the network. External and internal business networks. Risk management.

Assessment scale
Five step scale

IM00BD37 Delivery Project Management: 5 op

Credits
5 - 5

Objectives
After completing this course, the student
- knows the generally accepted project management areas
- applies common project management processes, methods and techniques
- understands the importance of communication in project management

Content
Project Life Cycle: Conception phase, Definition phase, Execution phase, Closure phase

Nine of the ten knowledge areas of the Project Management Body of Knowledge (PMBOK):
- Project Integration Management
- Project Scope Management
- Project Time Management
- Project Cost Management
- Project Quality Management
- Project Human Resource Management
- Project Communications Management
- Project Risk Management
- Project Stakeholder Management

Basic concepts of Agile Project Management

Assessment scale
Five step scale

IM00BD38 Sales Management: 5 op

Credits
5 - 5

Objectives
After completing the course, the student is able to:
- define a sales management process of a technological company
- understand the role of sales management in technology business in selling technical products or services
- recognize relevance of good sales work for customers and companies

Content
Sales planning and management in industrial product/service businesses. Professional sales techniques and skills.

Assessment scale
Five step scale

IM00BG57 Industrial Management Project 2: 5 op

Credits
5 - 5

Objectives
After completing the course, the student
- has experience from project work within an authentic industrial case in a multinational team
- has learnt teamwork and communication in a hands-on way
- has experience of independent working and showing initiative as well as being in charge
- is able to apply industrial management knowledge into practice and search for new information

Content
Case selection and team formation
Kick-off meeting with the company
Project planning
Project plan presentation in a seminar
Project execution in co-operation with the company
Project reporting
Project report presentation in a seminar
Closure meeting with the company
Project evaluation

Assessment scale
Five step scale

IM23SP-1003 Elective Studies: 15 op

Optionality
Select x cr

Credits
15 - 15

IM23SP-1007 Elective Studies: 15 op

Optionality
Select x cr

Credits
15 - 15

IM23SP-1004 Internship: 30 op

Optionality
All compulsory

IM23SP-1008 : 30 op

Optionality
All compulsory

EX00BD39 Internship 1: 5 op

Credits
5 - 5

Objectives
After completing the course the student is able to
- recognize different jobs in the field of education
- apply to jobs suitable for Internship 1
- make an internship contract and write an internship report
- evaluate his/her professional competencies and development needs
- observe the workplace's requirements and practices

Content
Applying for a job. Making an internship contract. Working in an internship place. Writing an internship report

Assessment scale
Five step scale

EX00BD40 Internship 2a: 5 op

Credits
5 - 5

Objectives
After completing the course the student is able to

- apply to jobs suitable for Internships 2-3 and plan his/her career path
- make an internship contract and write an internship report
- work and follow guidance in practical tasks that are central to the professional field
- apply the knowledge and skills learned at studies into practice
- recognize and follow the industry's requirements and practices, and understand the company's operations
- evaluate his/her professional competencies and development needs

Content
Applying for a job. Making an internship contract. Working in an internship place. Writing an internship report.

Assessment scale
Five step scale

EX00BD41 Internship 2b: 5 op

Credits
5 - 5

Objectives
After completing the course the student is able to
- apply to jobs suitable for Internships 2-3 and plan his/her career path
- make an internship contract and write an internship report
- work and follow guidance in practical tasks that are central to the professional field
- apply the knowledge and skills learned at studies into practice
- recognize and follow the industry's requirements and practices, and understand the company's operations
- evaluate his/her professional competencies and development needs

Content
Applying for a job. Making an internship contract. Working in an internship place. Writing an internship report.

Assessment scale
Five step scale

EX00BD42 Internship 3a: 5 op

Credits
5 - 5

Objectives
After completing the course the student is able to
- apply to jobs suitable for Internships 2-3 and plan his/her career path
- make an internship contract and write an internship report
- work and follow guidance in practical tasks that are central to the professional field
- apply the knowledge and skills learned at studies into practice
- recognize and follow the industry's requirements and practices, and understand the company's

operations
- evaluate his/her professional competencies and development needs

Content
Applying for a job. Making an internship contract. Working in an internship place. Writing an internship report.

Assessment scale
Five step scale

EX00BD43 Internship 3b: 5 op

Credits
5 - 5

Objectives
After completing the course the student is able to
- apply to jobs suitable for Internships 2-3 and plan his/her career path
- make an internship contract and write an internship report
- work and follow guidance in practical tasks that are central to the professional field
- apply the knowledge and skills learned at studies into practice
- recognize and follow the industry's requirements and practices, and understand the company's operations
- evaluate his/her professional competencies and development needs

Content
Applying for a job. Making an internship contract. Working in an internship place. Writing an internship report.

Assessment scale
Five step scale

EX00BD44 Internship 3c: 5 op

Credits
5 - 5

Objectives
After completing the course the student is able to
- apply to jobs suitable for Internships 2-3 and plan his/her career path
- make an internship contract and write an internship report
- work and follow guidance in practical tasks that are central to the professional field
- apply the knowledge and skills learned at studies into practice
- recognize and follow the industry's requirements and practices, and understand the company's operations
- evaluate his/her professional competencies and development needs

Content
Applying for a job. Making an internship contract. Working in an internship place. Writing an

internship report.

Assessment scale
Five step scale

THESIS Thesis: 15 op

Duration (years)
0

Primary teaching language
English

Details

Person in charge
Jari Linden

Description

Description
Thesis Planning (5 ECTS)
Thesis Implementation (5 ECTS)
Thesis Finalisation (5 ECTS)

Further information
The student shall acquire the material required for the thesis him/herself. Savonia’s thesis reporting instructions.

The student may create an individual yet appropriate timetable for the thesis process.

Curriculum development and working life cooperation
The thesis is always working life oriented. It may take the form of a
a) development work planned and implemented by a student or a group of students to meet the user's or client's needs. Development may focus on a product, service, process, working method, learning material or instruction, digital material, supervised activity etc. The student shall present the plan, its implementation and its evaluated output and the need for further development in a report whose form is suitable for the professional field in question.
b) research-based thesis, in which a student or a group of student approaches a practical problem or item to be developed with appropriate research methods. The student shall prepare a report describing the planning, implementation and results of the thesis and interpreting the results.
c) production, in which a student of a group of students demonstrates competence as an expert or as an artist by planning and implementing an event, a seminar, an artistic performance etc. The student shall present the plan, its implementation and its evaluated output in a report whose form is suitable for the professional field in question.
d) compiled thesis, in which parts planned as a thesis (e.g. projects) are implemented and reported. In the written synthesis, article or other publication, which is part of the thesis, the student shall present the essential results/output in a form that is suitable for the professional field in question.

Objectives
Student can
- choose a topic for thesis that is suitable for his or her field and his or her professional development and justify the choice from different perspectives
- plan and implement a working life oriented research and development work based on the needs of the user/client
- apply scientific and evidence-based information in the thesis process and in the development of his or her expertise
- appropriately use research and development methods or artistic methods that are suitable for his or her professional field and for the topic of the thesis
- prepare a clearly defined, logical and professionally appropriate report on his or her thesis
- evaluate the essential contents, results or output of his or her thesis and justify their significance from the perspectives of his or her field, the client's/user's need and his or her professional development
- evaluate his or her thesis process, its reliability and ethicality as well as his or her professional growth and learning during the work
- cooperate in a flexible manner with players involved in the thesis process and demonstrate his or her expertise
- take the maturity test on his or her thesis.

Optionality, prerequisites and offering information

Optionality
All compulsory

Prerequisites
Research methodology studies of the degree programme.

THESIS-1001 Thesis: 15 op

Optionality
All compulsory

XT00BA53 Thesis Planning: 5 op

Credits
5 - 5

Objectives
The student can
- choose a topic that is relevant for the development of both the field of study and his/her own expertise
- motivate his/her topic choice from various viewpoints
- create a thesis topic proposal and complete it into a thesis plan (= work plan)
- work flexibly with other people and parties involved in the thesis process
- present his /her knowledge and skills.

Content

Selecting a thesis topic and narrowing it down. Writing a thesis topic proposal. Signing a thesis project agreement. Finding a thesis supervisor. Information retrieval and reporting practices. Writing a thesis plan (= work plan) and finding source materials.

Further information
The student may create an individual yet appropriate timetable for the thesis process.

Prerequisites
Research methodology studies of the degree programme.

Assessment scale
Five step scale

XT00BA54 Thesis Implementation: 5 op

Credits
5 - 5

Objectives
The student can
- implement a working-life-oriented research and development project, which meets the needs of a user/client
- apply scientific and evidence-based knowledge to the thesis process in order to increase and develop his/her expertise
- create a report that is concise and logical and meets the professional standards of his/her field of study.
- assess the main contents, results and outcomes of the thesis and discuss their relevance to the field, the needs of a user/the client and the development of his/her expertise
- work flexibly with other people and parties involved in the process and demonstrate his/her expertise

Content
- working independently on the thesis
- guidance related to the various phases of the thesis
- the results/outcome of the thesis
- presentation of the thesis in a seminar

Further information
The student may set an individual yet appropriate timetable for his/her thesis process.

Prerequisites
Research methodology studies of the degree programme.
Course: Thesis Planning (5 ECTS).

Assessment scale
Five step scale

XT00BA55 Thesis Finalisation: 5 op

Credits
5 - 5

Objectives
The student can
- create a report that is concise and logical and meets the professional standards of his/her field of study
- assess the main contents, results and outcomes of the thesis and discuss their relevance to the field, the needs of a user/the client and the development of his/her expertise
- assess the thesis process, its reliability and ethicalness as well as his/her professional growth and development
- work flexibly with other people and parties involved in the process and demonstrate his/her expertise
- write a maturity test essay on the thesis process.

Content
- finalizing the thesis as well as writing and editing the report based on the feedback received in the thesis seminar and from the thesis supervisor
- detection of plagiarism
- submitting the thesis for assessment

Further information
The student may set an individual yet appropriate timetable for the thesis process.

Prerequisites
Research methodology studies of the degree programme.
Courses: Thesis Planning (5 ECTS) and Thesis Implementation (5 ECTS).

Assessment scale
Five step scale

XT00BA56 Maturity Test: 0 op

Credits
0 - 0

Objectives
The student can
- write the maturity test showing expertise in the field of his/her studies and proficiency in communication and language skills
- discuss the maturity test task/ question in a logical manner, showing professional competence and with relevance to the task
- summarise his/her thesis and focus on the essential concepts, facts and findings
- write a professional text in the appropriate style and without grammar mistakes.

Content
Enrolling to and writing the maturity test.

Further information

The information on student’s maturity test is included in the degree certificate.

Prerequisites
Completion of Thesis (15 ECTS)

Assessment scale
Five step scale