Vaasan yliopisto
UNIVERSITY OF VAASA

TUOTANTOTALOUS (TEKNIIKKA)
INDUSTRIAL ENGINEERING AND MANAGEMENT

(ISAN- JA ISANC-KOODIN OPINTOJAKSOT)
(COURSE CODES ISAN AND ISANC)

Aineopinnot
Intermediate Studies

■ Project in Energy Systems

Structure Type: Course
Code: ISANC2030
Type: Optional for VAMK Mechanical and Production Engineering students and compulsory for University of Vaasa B.Sc. students majoring in Industrial Engineering and Management
Credits: 5 ECTS
Responsible Organisation: VAMK
Responsible Teacher (VAMK): Adebayo Agbejule
Responsible Teacher (VY): N.N.
Team of Teachers: Adebayo Agbejule
Languages: English
Course Implementations, Planner year of Study and Semester: VAMK: Semester 4 autumn
Learning Outcomes: This course provides the student with the opportunity to carry out real project in the energy business. The target of the project is defined either in a company or in the University of Applied Sciences. This project starts after the completion of the Project Management for Energy Firms Course (VAMK students).
Student Workload: 10 h scheduled contact teaching, 50 h project work, independent work 75 h
Prerequisites / Recommended Optional Courses: Completed course in the renewable energy technology and knowledge of project marketing and management
Content: Identification of project company, project plan and reporting, visits to case company. Students would also learn to prepare feasibility studies of energy projects.
Study Materials: J. Edward Carryer, R. Matthew Ohline & Thomas W. Kenny: Introduction to Mechatronic Design, Pearson, New Jersey: 2011. Paul H. Lewis & Chang Yang: Basic Control Systems Engineering, Prentice-Hall, 1997. Material announced by the teacher.
Planned Learning Activities and Teaching Methods: Project work. 10 hrs of lectures and 50h project work with supervision by lecturer.
Grading: Active participation and presentation of project work. Scale 1-5/fail.
1: The student is able, with guidance, to utilise the methods learnt during the study unit
3: The student is able to utilise the methods learnt during the study unit independently
5: The student is able to utilise the methods learnt during the study unit independently and is able apply the learnt knowledge in new contexts
Modes of Study: Lectures and project work
Additional Information: Cooperation course with VAMK (Vaasa University of Applied Sciences)

■ Additive Manufacturing (3D printing and 3D scanning)
Ainetta lisäävä valmistus (3D skannaus ja tulostus)

Structure Type: Course
Code: ISANC2010
Type: Optional for VAMK Mechanical and Production Engineering students and compulsory for University of Vaasa B.Sc. students majoring in Industrial Engineering and Management
Credits: 5 ECTS
Responsible Organisation: VY
Responsible Teacher (VAMK): Rayko Toshev
Responsible Teacher (VY): Rayko Toshev

Team of Teachers: Rayko Toshev
Prerequisites: Students are expected to be familiar with the basics of product design and CAD software. However content and activities can be modified to meet a variety of student interests and skill levels. To complete assignments, students will get access to educator-selected CAD software outside the classroom, either on their own PC or in a computer lab.
Objectives: The course serves as a platform for educating the students about the process of digital design, prototyping and fabrication using additive manufacturing technology. It explains current and emerging 3D printing applications in a variety of industries. Describes the advantages and limitations of each 3D printing technology and explains the difference in used materials. It develops students' knowledge of prototyping and innovation, 3D scanning and 3D printing, embedded electronics.
Learning Outcomes: By the end of this course, students will have scanned and 3D printed their own parts, learning how to complete the path from design to fabrication. They will gain knowledge how to use Laser and Infra-red 3D scanners, how to export and prepare models in CAD software ready for 3D printing. They will learn also how to use FDM, SLA and DLP 3D printing machines and the related control software, nest and orient 3D models on the build tray to conserve space and materials for cost-efficient use of 3D printing technology. In addition during the exercises students will practice basics knowledge of circuits and signal processing using Arduino PCB and servo motors for automation applications.
Content: Design and CAD overview. Model repositories, customization and configurations. Introduction to 3D scanning technologies. Meet the scanners. 3D printing technologies. Hands on the Printers. Present final prototypes/models/parts.
Exercises include 3D Scanning, preparing mesh, scaling, fixing holes and testing printability, import and post processing the model into CAD. Positioning and slicing the model, generating the machine G-code and finally manufacturing the objects with 3D printers.
Study Materials:
Book: 3D printing : the next technology gold rush : future factories and how to capitalize on distributed manufacturing
Book: OpenSCAD for 3D Printing
Book: Zero to maker : learn (just enough) to make (just about) anything
Book: Open-source lab : how to build your own hardware and reduce research costs
Lecture slides, exercises and 3D printer and scanner machine manuals provided by teacher
Thingiverse, ThinkerCAD, 3DHubs, REPRAP online resources
Teaching Methods: 8 h lectures and 20 h exercises, laboratory project work, independent group work 107 h
Modes of Study: Online Quiz Exam in Moodle, written group project work report
Languages: Language(s) of instruction: English; completion language(s): English
Grading: scale 1-5 or fail, 50 % Moodle based exam and 50 % exercise work report
1: The student is able, with guidance, to utilise the methods learnt during the study unit.
3: The student is able to utilise the methods learnt during the study unit independently.
5: The student is able to utilise the methods learnt during the study unit independently and is able apply the learnt knowledge in new contexts.
Responsible Unit: School of Technology and Innovations
Right to participate: B.Sc. students Industrial Engineering and Management and Industrial Management, VAMK students
Additional Information: Check Moodle

■ Introduction to Renewable and Sustainable Energy

Johdatus uusiutuvaan ja kestävään energiaan

Code: ISAN2020
Credits: 5 ECTS
Prerequisites: Students are expected to be familiar with the basics of sustainable development and renewable energy types.
Learning Outcomes: To help students to identify the types of renewable energy sources, to design and audit these various types of renewable energy sources and its role in the supply chain model of renewable energy and energy efficiency. The idea is to help identify how each local setting can be sustainable by relying on the types of renewable energy available to them.
Content: Renewable energy technologies, heat production technologies, technologies for producing electricity, CHP technologies and site trip to a waste to energy facility: WestEnergy.
Study Materials:

- Book: Patel, R. Mukund., 2006, Wind and Solar Power Systems: Design, Analysis, and Operation. 2nd edition, ISBN- 0-8493-1570-0

- Book: VILAR (ED). 2012, Renewable Energy in Western Africa: Situations, Experiences and Tendencies. ISBN: 978–84-8198-880-2 / NIPO: 502–12-033-7
- Scientific Articles
- Supplementary Material Provided by the Teacher

Teaching Methods: Lectures and exercises 30 h, independent work 105 h
Modes of Study: Flipped learning, learning diary, group presentation and report, written exam
Languages: language(s) of instruction: English; completion language(s): English
Grading: scale 1-5 or fail, 40 % written exam and 40 % group work, 20% individual attendance, input and learning diary
Responsible Person: Jussi Kantola
Teacher(s): Emmanuel Ndzibah
Responsible Unit: School of Technology and Innovations
Right to participate: Bachelor's or Master's Student from Engineering, Industrial Management, Business students, Administrative Sciences, or related fields.
Additional Information: Check Moodle

■ Kandidaatintutkielma Tuotantotalous, tekniikka

Bachelor's Thesis
Huom. Energia- ja informaatiotekniikan tutkinto-ohjelman tuotantotalouden opintosuunnan tekniikan kandidaatin tutkinnon opiskelijoille

Koodi: TECH2970
Laajuus: 10 op
Ajankohta: 3. vuosi, opiskelija valitsee itse tutkielmansa aiheen ja aloittaa tutkielmatyöskentelyn osallistumalla aloitusseminaariin joko syys- tai kevätlukukauden alussa, seminaareja järjestetään kerran kuukaudessa tai tarpeen mukaan keskiviikkoisin klo 16:15 alkaen
Edellytykset: Vaasan yliopistossa järjestettävät sähkö- ja energiatekniikan suunnan opintojaksot tutkielman aihepiirin alalta
Osaamistavoitteet: Opiskelija osaa itsenäisesti etsiä tutkittua tietoa valitsemastaan aiheesta, osaa verrata tutkielman aihepiiriin liittyviä asioita keskenään, osaa rajata aihetta ja osaa raportoida sekä suullisesti että kirjallisesti annettujen ohjeiden mukaisesti. Opintojakso kehittää kirjallista ilmaisua, suullista ilmaisua (esitelmä) ja elinikäistä oppimista.
Sisältö: Alkuraportti (n. 1 sivu): sisältää tutkielman alustavan otsikon, lyhyen kuvauksen työstä ja aiheesta, aiheen keskeisemmät kirjallisuuslähteet sekä aikataulusuunnitelman.
Väliraportti (10–15) sivua: Vastaa työmäärältään noin 1/3 koko kandidaatin tutkielmasta. Väliraportissa edellytetään olevan: luonnos tiivistelmäsivuksi, tutkielman sisällysluettelo, johdanto, jossa tavoite ja rajoitus, kirjallisuustyössä kirjoitettuna keskeisiä tekstikohtia/empiirisessä työssä yksityiskohtainen toteutussuunnitelma, hahmotelma johtopäätöksistä. Hyväksytystä väliraportista kirjataan 3 opintopistettä.
Loppuraportti viimeistellään kirjoitusohjeiden mukaisesti. Kandidaatin tutkielma palautetaan sähköisesti PDF-muodossa Osuva-järjestelmään ja tarkastetaan Turnitin-plagiaatintunnistusjärjestelmällä. Tutkielmasta pidetään pienryhmässä seminaariesitys.
Oppimateriaali ja kirjallisuus: tutkielman aiheeseen liittyvät tieteelliset tekstit
Toteutustavat: aloitusluennot syys- ja kevätlukukauden alussa 2 h, ohjaus ja pienryhmätyöskentely 15 h.
Suoritustavat: aloitusluennot tai yhteydenotto omaan aihepiirin vastuuohjaajaan, alkuraportti, väliraportti (TECH2971, 3 op), seminaariesitys ja opponointi, Osuva-järjestelmään palautettu ja Turnitin-plagiaatintunnistusjärjestälmällä tarkastettu loppuraportti (TECH2972, 7 op), lisäksi kypsyysnäyte (KNÄYxxxx, 0 op). Osallistuminen vähintään kahteen seminaaritilaisuuteen ennen omaa esitystä. Opiskelija voi myös halutessaan edetä suoraan loppuraporttiin ja seminaariesitykseen.
Opetus- ja suorituskieli: tutkielman kieli voi olla suomi, ruotsi tai englanti
Arvostelu: asteikolla 1-5 tai hylätty
Vastuuhenkilöt: N.N.
Opettajat: N.N.
Vastuuorganisaatio: Tekniikan ja innovaatiojohtamisen akateeminen yksikkö
Lisätietoja: ks. tekniikan alan kandidaatin tutkielman laadintaohjeet ja kirjoitusohjeet. Ilmoittaudu kurssille, tarkemmat tiedot kurssi-ilmoittautumisjärjestelmän kautta, kandidaatin tutkielmat tarkistetaan Turnitin-plagiaatintunnistusjärjestelmällä

Syventävät opinnot
Advanced Studies

■ Analytics in Project Management
Analytiikka projektijohtamisessa

Code: ISAN3010
Credits: 5 ECTS
Prerequisites: Students are expected to be familiar with project management and basic statistics
Learning Outcomes: The students will learn how analytics helps to manage projects more effectively. The students will learn how to use analytical tools, technologies, and processes. The student will also learn how to integrate analytics with PMBOK, DMAIC and any other processes used in project management. Course develops organizational operation and IT skills (Generic skills).
Content: Project management analytics, data-driven decision making, Analytic Hierarchy Process, Lean Six Sigma, Applications of analytics
Study Materials:

- book: Singh, H. 2016, Project Management Analytics: A Data-Driven Approach to Making Rational and Effective Project Decisions, Pearson FT press, ISBN-13: 978-0134189949, 352 p.
- scientific articles
- material provided by the teacher

Teaching Methods: 135 hours in total including video lectures, reading scientific articles, individual assignments, team assignment, introduction and feedback lectures (blended learning)
Modes of Study: written exam, individual assignments and team assignment
Languages: language(s) of instruction: English; completion language(s): English
Grading: scale 1-5 or fail, 56% individual assignments, 20% exam, 10% learning diary and 14% team assignment
Responsible Person: N.N. (Ari Sivula)
Teacher(s): N.N. (Ari Sivula)
Responsible Unit: School of Technology and Innovations
Right to participate: M.Sc. students in Industrial Systems Analytics and Industrial Management
Additional Information: Check Moodle

■ Architecture of Complex Systems
Kompleksisten järjestelmien arkkitehtuuri

Code: ISAN3020
Credits: 5 ECTS
Prerequisites: students are expected to be familiar with systems engineering
Learning Outcomes: the students will understand what complex systems are and how their structure can be modelled, analyzed and designed. The students will learn to model, analyze and design the architecture of different types of systems. The students are expected to learn how to use theories and methods to design and develop complex system architectures in practice. Course develops critical and analytical thinking, Problem-solving and decision-making skills and IT skills (Generic skills).
Content: architecture of systems, complexity and complex systems, axiomatic design theory, DSM, analysis of conceptual and functional system structure, upstream and downstream integration, tools and methods to analyze and design complex system architecture
Study Materials:

1. book: System Architecture: Strategy and Product Development for Complex Systems, Edward Crawley, Bruce Cameron, Daniel Selva, Pearson, 1st edition, 2015, ISBN-13: 978-0133975345, 480 p.
2. book: Suh, N. P., 2001, Complexity: Theory and Applications, Oxford university press, ISBN-13: 9780195178760, 330 p.
3. scientific articles
4. material provided by the teacher

Teaching Methods: lectures and exercises 30 h**,** independent work 105 h
Modes of Study: written exam, written group work and participation in possible visitor lectures
Languages: language(s) of instruction: English; completion language(s): English
Grading: scale 1-5 or fail, 50 % written exam and 50 % group work
Responsible Person: Jussi Kantola

Teacher(s): Jussi Kantola
Responsible Unit: School of Technology and Innovations
Right to participate: M.Sc. students at the School of Technology and Innovations
Additional Information: Check Moodle

■ Systems Engineering
Systeemiteknologiat

Code: ISAN3070
Credits: 5 ECTS
Prerequisites: Students are expected to be familiar with different types of technical and human systems
Learning Outcomes: The students will understand what types of industrial and other systems exist. The students will learn different types of system components and their interaction. They will also learn how to design systems conceptually and functionally for different purposes. Also methods to control and manage systems are important learning outcomes. The students will learn to take an active role to analyze and design systems in practice. Course develops critical and analytical thinking and interpersonal skills (Generic skills).
Content: Different types of systems, system dynamics, system design process: conceptual and functional, system analysis and design evaluation, system control, system design for X, system engineering management
Study Materials:
1. book: Blanchard, B. S:, 2010, Systems Engineering and Analysis, 5th Edition, Series: Prentice Hall International Series in Industrial & Systems Engineering, Pearson, ISBN-13: 978-0132217354, 800 p.
2. scientific articles
3. material provided by the teacher

Teaching Methods: lectures and exercises 30 h, independent work 105 h
Modes of Study: written exam, written group work and participation in possible visitor lectures
Languages: language(s) of instruction: English; completion language(s): English
Grading: scale 1-5 or fail, 50 % written exam and 50 % group work
Responsible Person: Jussi Kantola
Teacher(s): Jussi Kantola
Responsible Unit: School of Technology and Innovations
Right to participate: M.Sc. students at the School of Technology and Innovations
Additional Information: Check Moodle

■ Project Portfolio Management
Projektiportfolion hallinta

Code: ISAN3040
Credits: 5 ECTS
Prerequisites: students are expected to be familiar with the basics of project management and strategic management
Learning Outcomes: the students will understand what are project portfolios and their role in today's industry. The students will learn how project portfolio management creates value for the company. The students will also learn practical methods and techniques to design, build and control project portfolios. The students will also learn approaches to handle uncertainty and risks as unavoidable elements in project portfolio management. Course develops critical and analytical thinking and organizational operation skills (Generic skills).
Content: Projects - programs - portfolios; Value creation and management; Methodologies, tools and techniques to manage project portfolios; Uncertainty and risk; Resource management
Study Materials:
1. book: Kodukula, P., Organizational Project Portfolio Management: A Practitioner's Guide, J. Ross Publishing, 2014, 328 p., ISBN-10: 1932159428, ISBN-13: 978-1932159424
2. scientific articles
3. material provided by the teacher

Teaching Methods: lectures and exercises 25 h, independent work 110 h
Modes of Study: written exam and written group work
Languages: language(s) of instruction: English; completion language(s): English
Grading: scale 1-5 or fail, 50 % written exam and 50 % team assignments
Responsible Person: N.N.
Teacher(s): N.N.
Responsible Unit: School of Technology and Innovations

Right to participate: M.Sc. students in Industrial Systems Analytics and Industrial Management
Additional Information: Check Moodle

■ Service Design
Palvelusuunnittelu

Code: ISAN3050
Credits: 5 ECTS
Prerequisites: Students are expected to be familiar data analytics
Learning Outcomes: The students will understand how to design services based on data, information and human expertise streams. The students will learn principles, proceses and tools to design services for customers. Course develops organizational operation and critical and analytical thinking (Generic skills).
Content: Service design, Customer driven services, Tools to design services, Principles of design, Service Dominant Logic, Data, Information and expertise based services
Study Materials:

- book: Reason, B., Løvlie, L., Flu, M. B., 2015, Service Design for Business: A Practical Guide to Optimizing the Customer Experience, ISBN-13: 978-1118988923, 208 p.
- scientific articles
- material provided by the teacher

Teaching Methods: lectures and exercises 33 h, independent work 102 h
Modes of Study: written exam, written group work and participation in possible visitor lectures
Languages: English
Grading: scale 1-5 or fail, 50 % written exam and 50 % team assignments
Responsible Person: N.N.
Teacher(s): N.N.
Responsible Unit: School of Technology and Innovations
Right to participate: M.Sc. students at the School of Technology and Innovations
Additional Information: Check Moodle. Please note that it is not possible to earn credits for both TITE3300 and ISAN3050, the contents of the courses is similar.

■ Lean Six Sigma Statistical Control
Lean Six Sigma – Tilastollinen laadunvalvonta

Code: ISAN3060
Credits: 5 ECTS
Prerequisites: Students are expected to be familiar with the basics of quality engineering and statistics
Learning Outcomes: The students will understand the concept of six sigma quality control in the organization's operations. The students will learn DMAIC (Define, Measure, Analyze, Improve and Control) phases and methods. The students will learn to apply suitable methods in practical cases. Course develops organizational operation and critical and analytical thinking (Generic skills).
Content: Six sigma and organizational goals, Lean principles, Design for Six Sigma methods, Define phase and tools, Measure phase and tools, Analyze phase and tools, Improve Phase and tools, Control phase and tools. The content follows the ASQ's certification's Body of Knowledge and addresses topic to the level Green Belts need
Study Materials:

- book: Munro, R. A., Ramu, G., Zrymiak, D. J., The Certified Six Sigma Green Belt Handbook, American Society for Quality, 2nd Edition, 2015, ISBN-13: 978-0873898911, 630 p.
- scientific articles
- material provided by the teacher

Teaching Methods: lectures and exercises 25 h, independent work 110 h
Modes of Study: written exam, written group work and participation in possible visitor lectures
Languages: language(s) of instruction: English; completion language(s): English
Grading: scale 1-5 or fail, 50 % written exam and 50 % team assignments
Responsible Person: N.N.
Teacher(s): N.N.
Responsible Unit: School of Technology and Innovations
Right to participate: M.Sc. students at the School of Technology and Innovations
Additional Information: Students have a possibility to receive the **Green Belt** certificate (see more information from the Moodle). Maximum amount of students accepted to the course is 25, ISA students have priority. Check other relevant information from the Moodle.

■ Industrial Project Work
Projektityö teollisuudessa

Code: ISAN3030
Credits: 5 – 10 ECTS
Prerequisites: This course is for the 2nd year Industrial Systems Analytics M.Sc. students
Learning Outcomes: Students will learn project work in real industrial / organizational settings. They will learn to work in teams having members from industry and university. Students will learn to apply the content of Industrial systems analytics courses in real case. Course develops organizational operation, interpersonal skills and critical and analytical thinking (Generic skills).
Content: The topic of the project work is specified yearly based on the negotiations with industrial / organizational partners. The topics include: products and services, productivity, quality, data management, processes, etc. The topic is given to students in the beginning of the second year of M.Sc. studies. Students will prepare a project plan and final project report to be approved by the company / organization and the teacher.
Study Materials: relevant literature and other material to the given topic and field
Teaching Methods: Students will submit a written project plan (2-3 pages) within a month from the beginning of the 3rd or 4th semester. By the end of 3rd or 4th semester the students will return a written project report following the structure of a normal academic report: cover page, table of content, numbered sections (introduction, relevant literature and material to the case, methods and tools used in the project, results, discussion and recommendations), and references. Students will also present their project orally. Independent work 135 - 270 h.
Modes of Study: written project plan, written final project report, oral / video presentation
Languages: English
Grading: scale 1-5 or fail, 20 % project plan, 50 % final project report, and 30 % oral presentation
Responsible Person: N.N.
Teacher(s): N.N.
Responsible Unit: School of Technology and Innovations
Right to participate: M.Sc. student in Industrial Systems Analytics and Industrial Management
Additional Information: Check Moodle

■ Master's Thesis
Diplomityö

Code: ISAN3990
Credits: 30 ECTS
Prerequisites: Master's level studies of industrial systems analytics
Learning Outcomes: Student will be able to conduct independent research work and practically apply the skills attained in the diverse fields of Industrial Systems Analytics and to use the relevant literature to support the student's own research work and written report. Course develops critical and analytical thinking, interpersonal skills and organisational operation (Generic skills).
Content: The thesis consists of the following parts:
ISAN3995 Research Plan and Presentation 10 ECTS
ISAN3996 Master's Thesis 20 ECTS
ISAN3991 Master's Thesis Presentation 0 ECTS

The topic can be specified from a project in a company or organization, a research in the School of Technology and Innovations (Industrial Management) or a subject of the student's own choosing. The topic must always be agreed upon with the thesis supervisor. After the topic is chosen a research plan video has to be made. The research plan contains at least an overview of the topic area, preliminary research questions, constraints, required theories, description of data collection and analyses methods, timetable and a preliminary table of contents. Research plan presentation in the seminar is recommended. The research plan is presented in the beginning of the thesis work.The results are saved as a video presentation close to the end of the thesis work. It is recommended to present the results also in the seminar. Thesis seminars are good occasions to find a topic or discuss the challenges in the thesis process. Master's Thesis must be written according to the Master's Thesis instructions and writing instructions. T**he final version of the thesis (PDF) is submitted digitally to the Osuva publications archive. The student will also e-mail the thesis to the supervisor and to Education Services.** The thesis is graded by the Dean on the basis of the thesis evaluators' recommendations. **Af-**

ter submitting the thesis for review and before graduation, the student needs to pass an examination based on the topic of the thesis, i.e. a maturity exam. The thesis supervisor will prepare the question(s) for this examination and it will take place in EXAM electronic exam service.
Study Materials: Video presentations
Teaching Methods: Personal supervision, thesis seminars, independent work 810 h
Modes of Study: Independent research and writing work, ISAN3995 research plan including a mandatory video and optional personal presentation, ISAN3996 thesis work, ISAN3991 research results including a video presentation and optional personal presentation
Languages: English or Finnish
Grading: Assessment scale for thesis: sufficient (1), satisfactory (2), good (3), very good (4) , excellent (5)
Responsible Person: N.N.
Teacher(s): Professors and lecturers at the School of Technology and Innovations (Industrial Management)
Responsible Unit: School of Technology and Innovations
Additional Information: All Master's Theses will be checked with the Turnitin plagiarism detection software

■ Industrial Internship
Työharjoittelu

Code: TECH2960/ISAN3950
Credits: 1-10 ECTS
Prerequisites:
Learning Outcomes: The student learns to apply studied theory in to a practical situation. Course develops critical and analytical thinking (Generic skills).
Content: Internship in a company or public organization, the aim is to gather practical work experience
Study Materials: -
Teaching Methods: Internship in a company or public organization
Modes of Study: Internship and written report
Languages: Finnish, English
Grading: Pass/fail
Responsible Person: N.N. (B.Sc. students), Jussi Kantola (M.Sc. students / IM program), N.N. (M.Sc. students / ISA program)
Teacher(s): N.N., Jussi Kantola, N.N.
Responsible Unit: School of Technology and Innovations
Additional Information: Participation: industrial internship, 2 weeks of full-time work gives 1 ECTS, the Department of Production's assistant approves the course B. Sc. students credit on the basis of the student's internship report and the attached work certificate. M. Sc. internship reports are approved by the Head of the ISA Programme. Can be done as a part of either the bachelor's degree or the master's degree, for more detailed instructions on internships and the internship report, see study guide of the School.