Filters used for the printout

Curriculum period: 2025-2026. **Studies included in the printout:** Courses. **Languages of the descriptions:** English. **Language of the printout template:** English.

LUTDEXCHSPRING Exchange Studies (Spring Semester)

LUTDEXCHSPRING Exchange Studies (Spring Semester)

CURRICULUM PERIOD 2025-2026

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	min 20 cr
Languages	English
Grading scale	Grading scale for degrees (distinction)
Content approval required	no
Locations	⚠ [information missing]
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	Lappeenranta-Lahti University of Technology LUT 100%
Responsible persons	Tarja Pettinen, Responsible teacher Armi Rissanen, Responsible teacher Jonna Naukkarinen, Responsible teacher Minna Loikkanen, Responsible teacher Annukka Ilves, Administrative person
Degree programme type	Master's Degree
Degree titles	Master of Science (Technology)
Study field	Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs)
Education classification	751203 Master of Science (Technology), Engineering Physics

Content description

EN: Whether you are planning to stay for a semester or a year, the exhange students coming to LUT have a proud history of enjoying themselves.
LUT will offer a large number of courses in many academic fields and the choice is yours! However, in order for you to make the most of your stay, please be proactive and take responsibility for your study plan and your studies.

Most of the courses are intended for Master's level or final year Bachelor students, but there are also choices available for those in their Bachelor studies. As the majority of courses are taught at the Master's level, students are expected to have bachelor level knowledge of relevant subjects.

The courses you include in your learning agreement may be subject to chance. A learning agreement is not considered as a course registration.
When starting your studies at LUT you need to enroll to courses and exams.

It is possible to study approximately 30 ECTS credits per one semester. Minimum number of credits per semester is 20.

We at Lappeenranta-Lahti University of Technology LUT (LUT University) invite you to join our high-standard and cross-cultural education and research community.

More information about exhange study experience at LUT www.lut.fi/exhange

Additional information

EN: Please note that in order to complete courses in Software Engineering the student should already have at least 12 credits of studies in programming.

DEGREE STRUCTURE

Part of the degree	Credits
EXCHANGE STUDIES (SPRING SEMESTER) DRAFT	min 20 cr
DEXCHSPRINGLPR LAPPEENRANTA, EXCHANGE STUDIES (SPRING SEMESTER) DRAFT	min 0 cr
MASTER'S LEVEL STUDIES, LAPPEENRANTA (grouping module)	
KEDEXCHSPRING_LPR CHEMICAL ENGINEERING DRAFT	min 0 cr
BJ02A1500 Current Issues in Enabling Technologies for Circular Economy DRAFT	5 cr
BJ02A2030 Fluid Dynamics in Chemical Engineering DRAFT	5 cr
BJ02A2051 Process Intensification DRAFT	5 cr
BJ02A3010 Membrane Technology DRAFT	5 cr
BJ04A2010 Development of New Sustainable Products and Solutions DRAFT	5 cr
BJ03A1020 Biological Waste Water Treatment DRAFT	5 cr
BJ02A0011 Laboratory Work Course in Chemical Technology DRAFT	10 cr
BJ02A0012 Advanced Laboratory Course in Chemical Technology DRAFT	30 cr
BJ04A7010 Bioeconomy DRAFT	5 cr
BJ02A6020 Power-to-X processes DRAFT	5 cr
LADEXCHSPRING_LPR COMPUTATIONAL ENGINEERING DRAFT	min 0 cr
BM20A3003 Statistical Parameter Estimation DRAFT	5 cr
BM20A4703 Partial Differential Equations with Applications DRAFT	5 cr
BM40A1401 GPU Computing DRAFT	6 cr
BM40A0902 3D Computer Vision DRAFT	6 cr
BM20A3401 Design of Experiments DRAFT	4 cr
BM20A7700 Special Course on Inverse Problems DRAFT	5 cr
BM40A0801 Machine Vision and Digital Image Analysis DRAFT	6 cr
BM20A3700 Statistical learning DRAFT	5 cr
BM20A5300 Computational Spectroscopy DRAFT	5 cr
SADEXCHSPRING_LPR ELECTRICAL ENGINEERING DRAFT	min 0 cr

BL20A1400 Renewable Energy Technology 6 cr
DRAFT

BL30A1310 Advanced Power Electronics 6 cr
DRAFT

BL30A1321 Modelling and Control of Power Electronic Converters 5 cr
DRAFT

BL40A2401 Electrical Engineering in Wind and Solar Systems 6 cr
DRAFT

BL40A3021 Technologies for Electrochemical Energy Conversion and Storage of Electricity 5 cr
DRAFT

BL20A0101 Thermal Design of an Electric Device 3 cr
DRAFT

BL40A1203 Digital Control 2 6 cr
DRAFT

BL40A1601 Embedded System Design 6 cr
DRAFT

BL40A2302 Energy Efficiency 4 cr
DRAFT

ENDEXCHSPRING_LPR ENERGY TECHNOLOGY min 0 cr
DRAFT

BH40A1501 Turbulence Models 4 cr
DRAFT

BH40A1570 Advanced Computational Fluid Dynamics 5 cr
DRAFT

BH40A1800 Steam Turbines 3 cr
DRAFT

BH50A1701 District Heating 4 cr
DRAFT

BH50A2200 Bioenergy and Energy Use in the Forest Industry 6 cr
DRAFT

BH61A0201 Energy Economics 5 cr
DRAFT

BH70A0101 Advanced Modelling Tools for Transport Phenomena 5 cr
DRAFT

YMDEXCHSPRING_LPR ENVIRONMENTAL TECHNOLOGY min 0 cr
DRAFT

BH60A2102 Advanced Course in Life Cycle Assessment 8 cr
DRAFT

BH60A6400 Energy Efficient Environment 2 3 cr
DRAFT

TUDEXCHSPRING_LPR INDUSTRIAL ENGINEERING AND MANAGEMENT min 0 cr
DRAFT

CS30A0940 Intelligent product-service systems 6 cr
DRAFT

CS30A1570 Complex Systems 6 cr
DRAFT

CS30A1620 Artificial Inventiveness 1 cr
DRAFT

CS30A1641 Inventive Product Design and Advanced TRIZ 6 cr
DRAFT

CS30A1671 Service Innovation and Management 6 cr
DRAFT

CS31A0720 Basics of ERP systems 6 cr
DRAFT

CS30A1365 Sustainability-oriented innovation 3 cr
DRAFT

CS30A0810 Must-Have Math for Decision Makers 3 cr
DRAFT

CS34A0780 Start-ups and venture formation 6 cr
DRAFT

CS34A0060 Academic entrepreneurship 6 cr
DRAFT

CS30A1630 System modelling 6 cr
DRAFT

KODEXCHSPRING_LPR MECHANICAL ENGINEERING min 0 cr
DRAFT

BK70A0102 Simulation, Laboratory Course 5 cr
DRAFT

BK70A0501 Machine Dynamics 5 cr
DRAFT

BK20A3100 Welding and Laser Processing of Metals 5 cr
DRAFT

BK30A1600 Laser and Additive Manufacturing Systems 5 cr
DRAFT

BK20A3000 Welding Automation 5 cr
DRAFT

FYDEXCHSPRING_LPR PHYSICS min 0 cr
DRAFT

FY30A0300 Solid State Detectors and Their Applications 3 cr
DRAFT

FY30A0400 Microelectronics and Readout Electronics for Experimental Physics 3 cr
DRAFT

FY30A0500 Reliability of Detectors and Microelectronics 4 cr
DRAFT

FY30A1100 From Pulse Shapes to Physics: Data Analysis in Particle Physics 5 cr
DRAFT

TIDEXCHSPRING_LPR SOFTWARE ENGINEERING min 0 cr
DRAFT

CT10A7004 Sustainability and IT 6 cr
DRAFT

CT10A7070 Hackathons and ICC events 1-6 cr
DRAFT

CT30A8912 Software and system architectures 6 cr
DRAFT

CT10A7022 Personal Literature Study 6 cr
DRAFT

CT70A3000 Software Maintenance 6 cr
DRAFT

CT70A9300 Software engineering seminar 4 cr
DRAFT

CT80A0200 Software Business 6 cr
DRAFT

YTMEXCHSPRINGOTHERS_LPR SOCIAL SCIENCES min 0 cr
DRAFT

- YTS010400 System Theory and System Interdependence 5 cr
  DRAFT
- YTS011500 Natural Resources Policy and Governance 5 cr
  DRAFT

BACHELOR'S LEVEL STUDIES, LAPPEENRANTA (grouping module)

- KAKEXCHSPRING_LPR BUSINESS ADMINISTRATION min 0 cr
  DRAFT
  - KAKEXCHLITOSPRING_LPR BUSINESS ADMINISTRATION ONLY FOR ENGINEERING AND SOCIAL SCIENCE STUDENTS min 0 cr
    DRAFT
    - VA10A1000 Basics of Management and Organisations 5 cr
      DRAFT
    - VA10A1100 Basics of Marketing and Sales 5 cr
      DRAFT
    - VA10A1400 Economics and the Business Environment 5 cr
      DRAFT
    - VA10A1600 Introduction to Corporate Social Responsibility 5 cr
      DRAFT
    - VA10A1700 Understanding and Managing a Business as a Dynamic Whole - Business Simulation Game 5 cr
      DRAFT
  - A380A0131 Business Relationships in International Value Networks 6 cr
    DRAFT
  - A130A0551 Organizational Behaviour 6 cr
    DRAFT
  - A130A0620 Basics in MS Excel for Business Students 3 cr
    DRAFT
  - A380A0400 Professional Selling 6 cr
    DRAFT
  - A130A0680 Statistics for Economics 6 cr
    DRAFT
  - A380A0500 Introduction to Corporate Social Responsibility and Sustainability 6 cr
    DRAFT
  - A380A0310 Services Marketing and Customer Experience Management 3 cr
    DRAFT
  - A380A6060 Applied International Business 6 cr
    DRAFT
  - A380A6000 Cross-Cultural Encounters 3 cr
    DRAFT
  - A380A0000 Cross-Cultural Issues in International Business 6 cr
    DRAFT
  - A380A0300 Introduction to Digital Marketing 3 cr
    DRAFT
- LAKEXCHSPRING_LPR COMPUTATIONAL ENGINEERING min 0 cr
  DRAFT
  - BM40A0202 Foundations of Computer Science 6 cr
    DRAFT
  - BM20A8801 Discrete Mathematics 3 cr
    DRAFT
  - BM20A7102 Statistics II 4 cr
    DRAFT

SAKEXCHSPRING_LPR ELECTRICAL ENGINEERING — min 0 cr
DRAFT

- BL40A2011 Introduction to Cyber-Physical Systems — 4 cr
  DRAFT
- BL40A1812 Introduction to Embedded Systems — 6 cr
  DRAFT
- BL30A0001 Electric Circuits — 4 cr
  DRAFT
- BL30A0350 Electromagnetism and Circuit Analysis — 6 cr
  DRAFT
- BL40A2601 Wind Power and Solar Energy Technology and Business — 5 cr
  DRAFT
- BL50A0021 Basic Electronics 1 — 3 cr
  DRAFT
- BL50A0210 Introduction to EMC — 3 cr
  DRAFT

ENKEXCHSPRING_LPR ENERGY TECHNOLOGY — min 0 cr
DRAFT

- BH40A0102 Basics of Renewable Energy Engineering — 3 cr
  DRAFT
- BH50A0220 Energy Systems — 5 cr
  DRAFT
- BH40A1401 Fluid Mechanics I — 3 cr
  DRAFT
- BH10A1900 Fundamentals of Energy Technology — 2 cr
  DRAFT
- BH50A0240 Introduction to Power Plant Engineering — 4 cr
  DRAFT

YMKEXCHSPRING_LPR ENVIRONMENTAL TECHNOLOGY — min 0 cr
DRAFT

- BH60A5901 Climate Solutions — 5 cr
  DRAFT
- BH60A7200 Circular.now — 3 cr
  DRAFT
- BH60A0002 Basic Course in Environmental Technology A — 6 cr
  DRAFT
- BH60A6801 Sustainable.now — 3-5 cr
  DRAFT
- BH60A6000 Basic Course in Life Cycle Assessment — 4 cr
  DRAFT

TUKEXCHSPRING_LPR INDUSTRIAL ENGINEERING AND MANAGEMENT — min 0 cr
DRAFT

- CS30A1365 Sustainability-oriented innovation — 3 cr
  DRAFT

LESKEXCHSPRING_LPR LUT SCHOOL OF ENERGY SYSTEMS — min 0 cr
DRAFT

- LES10A260 Technical Computing Software — 4 cr
  DRAFT
- LES10A410 Engineering Project Work — 5-10 cr
  DRAFT

KOKEXCHSPRING_LPR MECHANICAL ENGINEERING — min 0 cr
DRAFT

- **BK10A6300** Engineering Design — 3 cr
  DRAFT
- **TIKEXCHSPRING_LPR** SOFTWARE ENGINEERING — min 0 cr
  DRAFT
  - **CT60A4304** Basics of database systems — 3 cr
    DRAFT
  - **CT60A7650** Database Systems Management — 3 cr
    DRAFT
  - **CT60A5532** Software Project Management — 6 cr
    DRAFT
  - **CT70A9111** Software Development Skills: Front-End — 1 cr
    DRAFT
  - **CT70A9120** Software Development Skills: Mobile — 3 cr
    DRAFT
  - **CT70A9140** Software Development Skills: Full-Stack — 3 cr
    DRAFT
  - **CT10A7052** Software Engineering work practise — 3 cr
    DRAFT
  - **CT70A9150** Introduction to DevOps — 3 cr
    DRAFT
- **YTKEXCHSPRING_LPR** SOCIAL SCIENCES — min 0 cr
  DRAFT
  - **VT10A1400** Environmental Communication — 5 cr
    DRAFT
  - **VT10A1500** Political Communication, Social Movements and Activism — 5 cr
    DRAFT

LANGUAGE STUDIES (grouping module)

- **KIEEXCHSPRING_LPR** LANGUAGE STUDIES — min 0 cr
  DRAFT
  - FINNISH (grouping module)
    - **K200CE69** Finnish 1 — 3 cr
      DRAFT
    - **K200CE70** Finnish 2 — 3 cr
      DRAFT
    - **K200CH62** Finnish 3 — 3 cr
      DRAFT
    - **K200CH63** Finnish 4 — 3 cr
      DRAFT
    - **K200CL50** Finnish for Work 1 — 5 cr
      DRAFT
    - **K200CG35** Finnish for Work 2 — 5 cr
      DRAFT
    - **K200CU41** Suomi with Love 1 — 3 cr
      DRAFT
    - **K200CS72** Independent study in Finnish — 2 cr
      DRAFT
    - **K200CQ88** Finnish Conversation 2 — 5 cr
      DRAFT
    - **K200CP87** Finnish Conversation 1 — 3 cr
      DRAFT
  - ENGLISH (grouping module)

- **KE00BZ84** English for Professional Development (Business) 4 cr
  DRAFT
- **KE00BZ85** English for Professional Development (Technology) 4 cr
  DRAFT
- **KE00BZ83** English for Professional Development (ESTIEM) 4 cr
  DRAFT
- **KE00CG81** Business Writing 3 cr
  DRAFT
- **KE00BZ81** Academic Writing 3 cr
  DRAFT
- **KE00CG33** Writing for Digital Media 4 cr
  DRAFT
- **KE00CQ38** Introduction to Copywriting 2 cr
  DRAFT
- **KE00CG79** Professional Reading 3 cr
  DRAFT
- **KE00CG82** Online Presentations 3 cr
  DRAFT
- **KE00BX35** English Pronunciation 1 cr
  DRAFT
- **KE00CC64** English Prep Course 3 cr
  DRAFT
- **KE00DG83** English and AI: Terminology, Ethics and Writing 1 cr
  DRAFT
- **KE00DB63** Copywriter´s Portfolio 2 cr
  DRAFT
- **KE00CX55** Responsible Communication 1 cr
  DRAFT
- **KM00BX75** Each one teach one 3 cr
  DRAFT

GERMAN (grouping module)

- **KD00CH39** German 1 3 cr
  DRAFT
- **KD00CH40** German 2 3 cr
  DRAFT
- **KD00CH41** German 3 3 cr
  DRAFT
- **KD00CH43** German for Work 2 3 cr
  DRAFT
- **KD00CT54** German for Work 3 3 cr
  DRAFT
- **KD00CZ29** Spoken German Skills 3 cr
  DRAFT

FRENCH (grouping module)

- **KF00CH30** French 1 3 cr
  DRAFT
- **KF00CH31** French 2 3 cr
  DRAFT
- **KF00CH32** French 3 3 cr
  DRAFT
- **KF00CG43** French for Work 1 3 cr
  DRAFT

- KF00CG44 French for Work 2 — 3 cr
  DRAFT
- KF00CL06 Le monde francophone — 5 cr
  DRAFT

SPANISH (grouping module)

- KP00CK94 Spanish 1 — 3 cr
  DRAFT
- KP00CH26 Spanish 2 — 3 cr
  DRAFT
- KP00CH27 Spanish 3 — 3 cr
  DRAFT
- KP00CP90 Spanish 6 — 3 cr
  DRAFT
- KP00BX61 Spanish for Working Life 1 — 3 cr
  DRAFT
- KP00BX62 Spanish for Working Life 2 — 3 cr
  DRAFT

CHINESE (grouping module)

- KC00DB86 Chinese 1 — 2 cr
  DRAFT
- KC00DB87 Chinese 2 — 3 cr
  DRAFT
- KC00DB88 Chinese 3 — 4 cr
  DRAFT

SWEDISH (grouping module)

- KR00CL24 Swedish for Beginners — 3 cr
  DRAFT

INTERCULTURAL COMPETENCE AND COMMUNICATION (grouping module)

- KM00BX75 Each one teach one — 3 cr
  DRAFT
- KM00CO04 Finnish Culture and Society — 3 cr
  DRAFT
- KE00CF69 Intercultural Competence and Communication — 5 cr
  DRAFT

DEXCHSPRINGLAHTI LAHTI, EXCHANGE STUDIES (SPRING SEMESTER) — min 0 cr
DRAFT

MASTER'S LEVEL STUDIES, LAHTI (grouping module)

- KEDEXCHSPRING_LAHTI CHEMICAL ENGINEERING — min 0 cr
  DRAFT
- LADEXCHSPRING_LAHTI COMPUTATIONAL ENGINEERING — min 0 cr
  DRAFT
- SADEXCHSPRING_LAHTI ELECTRICAL ENGINEERING — min 0 cr
  DRAFT
- ENDEXCHSPRING_LAHTI ENERGY TECHNOLOGY — min 0 cr
  DRAFT
  - BH70A0101 Advanced Modelling Tools for Transport Phenomena — 5 cr
    DRAFT
- YMDEXCHSPRING_LAHTI ENVIRONMENTAL TECHNOLOGY — min 0 cr
  DRAFT
- TUDEXCHSPRING_LAHTI INDUSTRIAL ENGINEERING AND MANAGEMENT — min 0 cr
  DRAFT

- **KODEXCHSPRING_LAHTI** MECHANICAL ENGINEERING — min 0 cr
  DRAFT
  - **BK10A4101** Modern Management and Leadership in Engineering — 5 cr
    DRAFT
- **FYDEXCHSPRING_LAHTI** PHYSICS — min 0 cr
  DRAFT
  - **FY30A0300** Solid State Detectors and Their Applications — 3 cr
    DRAFT
  - **FY30A0400** Microelectronics and Readout Electronics for Experimental Physics — 3 cr
    DRAFT
  - **FY30A0500** Reliability of Detectors and Microelectronics — 4 cr
    DRAFT
  - **FY30A1100** From Pulse Shapes to Physics: Data Analysis in Particle Physics — 5 cr
    DRAFT
- **TIDEXCHSPRING_LAHTI** SOFTWARE ENGINEERING — min 0 cr
  DRAFT
  - **CT10A7004** Sustainability and IT — 6 cr
    DRAFT
  - **CT10A7070** Hackathons and ICC events — 1-6 cr
    DRAFT
  - **CT30A8912** Software and system architectures — 6 cr
    DRAFT
  - **CT10A7022** Personal Literature Study — 6 cr
    DRAFT
  - **CT70A3000** Software Maintenance — 6 cr
    DRAFT
  - **CT70A9300** Software engineering seminar — 4 cr
    DRAFT
  - **CT80A0200** Software Business — 6 cr
    DRAFT
- **YTMEXCHSPRINGOTHERS_LAHTI** SOCIAL SCIENCES — min 0 cr
  DRAFT

BACHELOR'S LEVEL STUDIES, LAHTI (grouping module)

- **KAKEXCHSPRING_LAHTI** BUSINESS ADMINISTRATION — min 0 cr
  DRAFT
  - **KAKEXCHLITOSPRING_LAHTI** BUSINESS ADMINISTRATION ONLY FOR ENGINEERING AND SOCIAL SCIENCE STUDENTS — min 0 cr
    DRAFT
    - **VA10A1000** Basics of Management and Organisations — 5 cr
      DRAFT
    - **VA10A1100** Basics of Marketing and Sales — 5 cr
      DRAFT
    - **VA10A1400** Economics and the Business Environment — 5 cr
      DRAFT
    - **VA10A1600** Introduction to Corporate Social Responsibility — 5 cr
      DRAFT
    - **VA10A1700** Understanding and Managing a Business as a Dynamic Whole - Business Simulation Game — 5 cr
      DRAFT
  - **A380A0131** Business Relationships in International Value Networks — 6 cr
    DRAFT

A130A0551 Organizational Behaviour 6 cr
DRAFT

A130A0620 Basics in MS Excel for Business Students 3 cr
DRAFT

LAKEXCHSPRING_LAHTI COMPUTATIONAL ENGINEERING min 0 cr
DRAFT

SAKEXCHSPRING_LAHTI ELECTRICAL ENGINEERING min 0 cr
DRAFT

ENKEXCHSPRING_LAHTI ENERGY TECHNOLOGY min 0 cr
DRAFT

BH40A0102 Basics of Renewable Energy Engineering 3 cr
DRAFT

BH50A0220 Energy Systems 5 cr
DRAFT

BH40A1401 Fluid Mechanics I 3 cr
DRAFT

BH10A1900 Fundamentals of Energy Technology 2 cr
DRAFT

YMKEXCHSPRING_LAHTI ENVIRONMENTAL TECHNOLOGY min 0 cr
DRAFT

BH60A5901 Climate Solutions 5 cr
DRAFT

BH60A7200 Circular.now 3 cr
DRAFT

BH60A6801 Sustainable.now 3-5 cr
DRAFT

BH60A6000 Basic Course in Life Cycle Assessment 4 cr
DRAFT

TUKEXCHSPRING_LAHTI INDUSTRIAL ENGINEERING AND MANAGEMENT min 0 cr
DRAFT

CS39A0030 Entrepreneurship and SMEs 6 cr
DRAFT

CS39A0060 B2B Marketing in industrial context 6 cr
DRAFT

CS39A0040 Product and Service Development 6 cr
DRAFT

CS39A0090 Networks and ecosystems 6 cr
DRAFT

CS39A0020 Basics of innovation management 6 cr
DRAFT

LESKEXCHSPRING_LAHTI LUT SCHOOL OF ENERGY SYSTEMS min 0 cr
DRAFT

LES10A260 Technical Computing Software 4 cr
DRAFT

LES10A410 Engineering Project Work 5-10 cr
DRAFT

KOKEXCHSPRING_LAHTI MECHANICAL ENGINEERING min 0 cr
DRAFT

TIKEXCHSPRING_LAHTI SOFTWARE ENGINEERING min 0 cr
DRAFT

CT60A4350 Basics of Database Systems (Lahti) 3 cr
DRAFT

- **CT60A7660** Database Systems Management (Lahti) 3 cr
  DRAFT
- **CT60A5550** Software Project Management (Lahti) 3 cr
  DRAFT
- **CT70A9111** Software Development Skills: Front-End 1 cr
  DRAFT
- **CT70A9120** Software Development Skills: Mobile 3 cr
  DRAFT
- **CT70A9140** Software Development Skills: Full-Stack 3 cr
  DRAFT
- **CT10A7052** Software Engineering work practise 3 cr
  DRAFT
- **CT70A9150** Introduction to DevOps 3 cr
  DRAFT

LANGUAGE STUDIES (grouping module)

- **KIEEXCHSPRING_LAHTI** LANGUAGE STUDIES min 0 cr
  DRAFT
  - FINNISH (grouping module)
    - **K200CE69** Finnish 1 3 cr
      DRAFT
    - **K200CE70** Finnish 2 3 cr
      DRAFT
    - **K200CH62** Finnish 3 3 cr
      DRAFT
    - **K200CH63** Finnish 4 3 cr
      DRAFT
    - **K200CL50** Finnish for Work 1 5 cr
      DRAFT
    - **K200CG35** Finnish for Work 2 5 cr
      DRAFT
    - **KM00CO04** Finnish Culture and Society 3 cr
      DRAFT
    - **K200CS72** Independent study in Finnish 2 cr
      DRAFT
    - **K200CQ88** Finnish Conversation 2 5 cr
      DRAFT
    - **K200CP87** Finnish Conversation 1 3 cr
      DRAFT
  - ENGLISH (grouping module)
    - **KE00BZ84** English for Professional Development (Business) 4 cr
      DRAFT
    - **KE00BZ85** English for Professional Development (Technology) 4 cr
      DRAFT
    - **KE00BZ83** English for Professional Development (ESTIEM) 4 cr
      DRAFT
    - **KE00CG81** Business Writing 3 cr
      DRAFT
    - **KE00BZ81** Academic Writing 3 cr
      DRAFT
    - **KE00CG33** Writing for Digital Media 4 cr
      DRAFT

- **KE00CQ38** Introduction to Copywriting — 2 cr
  DRAFT
- **KE00CG79** Professional Reading — 3 cr
  DRAFT
- **KE00CG82** Online Presentations — 3 cr
  DRAFT
- **KE00BX35** English Pronunciation — 1 cr
  DRAFT
- **KE00CC64** English Prep Course — 3 cr
  DRAFT
- **KE00DG83** English and AI: Terminology, Ethics and Writing — 1 cr
  DRAFT
- **KE00DB63** Copywriter´s Portfolio — 2 cr
  DRAFT
- **KE00CX55** Responsible Communication — 1 cr
  DRAFT
- **KM00BX75** Each one teach one — 3 cr
  DRAFT

GERMAN (grouping module)

- **KD00CH39** German 1 — 3 cr
  DRAFT
- **KD00CH40** German 2 — 3 cr
  DRAFT
- **KD00CH41** German 3 — 3 cr
  DRAFT
- **KD00CH43** German for Work 2 — 3 cr
  DRAFT
- **KD00CT54** German for Work 3 — 3 cr
  DRAFT
- **KD00CZ29** Spoken German Skills — 3 cr
  DRAFT

FRENCH (grouping module)

- **KF00CH30** French 1 — 3 cr
  DRAFT
- **KF00CH31** French 2 — 3 cr
  DRAFT
- **KF00CH32** French 3 — 3 cr
  DRAFT
- **KF00CG43** French for Work 1 — 3 cr
  DRAFT
- **KF00CG44** French for Work 2 — 3 cr
  DRAFT
- **KF00CL06** Le monde francophone — 5 cr
  DRAFT

SPANISH (grouping module)

- **KP00CK94** Spanish 1 — 3 cr
  DRAFT
- **KP00CH26** Spanish 2 — 3 cr
  DRAFT
- **KP00CH27** Spanish 3 — 3 cr
  DRAFT

- **KP00CP90** Spanish 6 — 3 cr
  DRAFT
- **KP00BX61** Spanish for Working Life 1 — 3 cr
  DRAFT
- **KP00BX62** Spanish for Working Life 2 — 3 cr
  DRAFT

CHINESE (grouping module)

- **KC00DB86** Chinese 1 — 2 cr
  DRAFT
- **KC00DB87** Chinese 2 — 3 cr
  DRAFT
- **KC00DB88** Chinese 3 — 4 cr
  DRAFT

SWEDISH (grouping module)

- **KR00CL24** Swedish for Beginners — 3 cr
  DRAFT

INTERCULTURAL COMPETENCE AND COMMUNICATION (grouping module)

- **KM00CO04** Finnish Culture and Society — 3 cr
  DRAFT
- **KE00CF69** Intercultural Competence and Communication — 5 cr
  DRAFT
- **KM00DA70** Multicultural Teamwork and Leadership — 5 cr
  DRAFT

FILTERED COURSES

BJ02A1500 Current Issues in Enabling Technologies for Circular Economy

BJ02A1500 Current Issues in Enabling Technologies for Circular Economy

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Chemical Engineering 100%
Responsible persons	Armi Rissanen, Administrative person Miia John, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: By the end of the course, the students are expected to be able to:
1. Understand basic concepts of circular economy (raw materials, processing, manufacturing until end-of-life recycling and reuse) and the drivers for change from linear to circular economy.
2. Understand and evaluate the processing technologies of materials in context of circular economy.
3. Recognize and compare impacts (environmental, economic and social) of processing technologies when assessing the current (linear) practice of material processing vs circular value chains.
4. Apply the transferable skills of life cycle thinking (ecodesign) to evaluate processing technologies in circular value chains.

Content

EN: The course will introduce the most important processing technologies that enable the implementation of circular economy, such as recycling and recovery as well as separation and purification technologies. The approach of the course is mainly solution based and thus aims to show practical examples on the utilization of different technologies in solving different kind of challenges in circular economy. A special emphasis is laid on topical themes, such as recycling and upgrading of plastic, electric, packaging and textile waste as well as on the production of biofuels. The course will also introduce the concept of ecodesign as a tool to manage the complex value chains in circular economy.

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG): 6 clean water and sanitation, 7 affordable and clean energy, 9 industry, innovation and infrastructure, 12 responsible consumption and production, 13 climate action, 17 partnership for the goals

Study materials

EN: The course material and the guidance to supplementary material is provided in connection with the different topics.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 4. period, 3. period	5 cr
Course Completion		5 cr

BJ02A2030 Fluid Dynamics in Chemical Engineering

BJ02A2030 Fluid Dynamics in Chemical Engineering

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Chemical Engineering 100%
Responsible persons	Armi Rissanen, Administrative person Tuomas Koiranen, Responsible teacher Samuel Perez Vega, Responsible teacher Samuel Emebu, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: BH40A1400 Virtaustekniikka I (Fluid Dynamics I) or equivalent passed, BM20A1501 Numeeriset menetelmät I (Numerical methods I) or equivalent passed.

Learning outcomes

EN: A student can: Select, size and scale-up different mixing devices (stirred tanks, in-line mixers) for blending and multiphase mixing (solid-liquid mixing, liquid and gas dispersions) based on short-cut design methods. Understand basics of fluid rheology and can adapt the information to mixing design. Understand computational fluid dynamics (CFD) calculations and is able to solve basic fluid mixing problems with CFD programs. Heat transfer, chemical reactions, laminar and turbulent flow in CFD. Relevant cases in Power-to-X chemicals production technologies.

Content

EN: Design methods and scale-up of fluid mixers, rheology, mixing effects in chemical reactors. Theoretical basics of CFD in chemical engineering with Power-to-X aspects and ability to solve basic mixing problems with CFD. COMSOL Multiphysics software.

Additional information

EN: You may also be interested in "Computational Fluid Dynamics for Environmental Flows (5 op) BM20A5104.
The course is related to UN's Sustainable Development Goals (SDG):

7 affordable and clean energy

9 industry, innovation and infrastructure

13 Climate actions

Study materials

EN: Lecture materials in Moodle.
Mixing Device Design

Perry's Chemical Engineers' Handbook, Perry, R.H., Green, D.W., Maloney J.O. (Eds.), McGraw-Hill, New York; Handbook of Industrial Mixing, Science and Practice, Paul, E.L., Atiemo-Obeng, V.A., Kresta, S.M., (Edits.), John Wiley & Sons, USA, 2004; EKATO-Handbook of Mixing Technology, EKATO Rühr- und Mischtechnik GmbH, Schopfheim; Zlokarnik, M., Stirring: Theory and Practice, Wiley-VCH, Weinheim, 2001

CFD Material

Tu, J., Yeoh, G. H. & Liu, C. (2013). Computational fluid dynamics: A practical approach (2nd ed.). Amsterdam ; Boston: Elsevier/Butterworth-Heinemann (e-book); An introduction to computational Fluid Dynamics –The finite volume method, 2nd Edition, H. K. Versteeg and W. Malalasekera, 2007

An introduction to computational Fluid Dynamics –The finite volume method, Second Edition, H. K. Versteeg and W. Malalasekera, 2007 (book)

Comsol Multiphysics User's Guide (inside Software)

www.cfd-online.com

www.bakker.org

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period	5 cr
Course Completion		5 cr

BJ02A2051 Process Intensification

BJ02A2051 Process Intensification

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Chemical Engineering 100%

Responsible persons	Armi Rissanen, Administrative person Emma Laasonen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: Upon completion of the module, the student will be able to:
- explain the principles and goals of process intensification, describe advantages of process intensification and
typical intensification methods
- explain and apply intensified reactors and separation equipment, combination of reaction and separation, hybrid separation,
alternative energy sources, transformation of batch processes to continuous ones
- recognize possibilities to intensify processes and apply novel technology in existing processes.

Content

EN: The course covers different process intensification methods and their theoretical background. Teaching involves lectures, assignments, meetings and seminars. The main work will be carried out as a process design project assignment where students will work in teams aiming to intensify a process given by the teacher. Each team will write a report and present their results in seminar. The topics focus mainly on intensification of different Power-to-X processes, such as production of E-fuels, carbon neutral products, energy storage etc.

Additional information

EN: Full digi
The course is related to UN's Sustainable Development Goals (SDG):

no poverty, zero hunger, good health and well-being, quality education, gender equality, clean water and sanitation, affordable and clean energy, decent work and economic growth, industry, innovation and infrastructure, reduced inequalities, sustainable cities and communities, responsible consumption and production, climate action, life below water, life and land, peace, justice and strong institutions, partnership for the goals.

Study materials

EN: Video lectures, lecture notes and other material given by the teacher.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 4. period	5 cr
Course Completion		5 cr

BJ02A3010 Membrane Technology

BJ02A3010 Membrane Technology

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Chemical Engineering 100%

Responsible persons	Armi Rissanen, Administrative person Mika Mänttäri, Responsible teacher Arto Pihlajamäki, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: At the end of the course a student is expected to know how to: - explain the basic terms and membrane processes - interpret observed phenomena in the separation process and their influence to the separation process - compare the feasibility of membrane materials, modules
and manufacturing processes - choose the most appropriate membrane and membrane process for a separation process - identify the possibilities, benefits and limits of membrane processes.

Content

EN: Membrane processes (micro-, ultra- and nanofiltration, reverse osmosis, pervaporation, etc.). Manufacturing membranes, membrane materials and structures, phenomena in membrane processes (fouling, concentration polarisation, etc.). Modules. Separation mechanisms.
Characterisation of membranes. Applications.

Additional information

EN: Note! Biorefineries students who haven´t passed this course yet take instead course BJ04A4010 Membrane Technology in Biorefining to their MSc degree.

Study materials

EN: Lecture presentations and additional material (Moodle): book chapters and articles. Mulder, M., Basic Principles of Membrane Technology, 2nd ed., Kluwer, 1996/2003.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 1. period-SummerSummer	5 cr
Course Completion		5 cr

BJ04A2010 Development of New Sustainable Products and Solutions

BJ04A2010 Development of New Sustainable Products and Solutions

Abbreviation: DNSPS

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Chemical Engineering 100%
Responsible persons	Armi Rissanen, Administrative person Rama Layek, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Equivalences (free text field)

EN: BJ02A4051 Development of New Sustainable Products and Solutions (old course)

Learning outcomes

EN: After completing the course, the students will be familiar with various types of new sustainable product development and solutions.

- Student will get adequate knowledge for tailoring of functionalities of biobased polymers to meet functionality needed for specific the application.
- Student will be familiar with various renewable resources (biomaterials, biochemiclas, cellulose, lignin, starch, carbohydrates etc) based sustainable product development and their applications
- have an insight into material and molecular design and its role for the product performance
- Use of forest resources and forest derived biomaterials for food, pharmaceuticals, composites, industry, and other applications.

Content

EN: The course contains an introduction with an overview of sustainable biobased product, bio-based barrier technologies for packaging applications, Biobased Hygienic Products and Solutions, Biomaterials for Printing, Biobased tall oil product. and Biomaterials in food application. Fundamentals about biomaterial design, modification, synthesis and use of fibers, cellulose (derivatives), lignin in various products. Chemical and mechanical modification, separation methods, mixing and drying methods. Product specification requirements and characterization methods. In addition, the course contains an interesting topic of group and individual assignment related to modern trends of sustainable biobased products and solutions.

Additional information

EN: Suitable for doctoral studies.
***
The course is related to UN's Sustainable Development Goals (SDG): 3 good health and well-being, 12 responsible consumption and production

Study materials

EN: Lecture material will be distributed via Moodle.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 4. period-Summer	5 cr
Course Completion		5 cr

BJ03A1020 Biological Waste Water Treatment

BJ03A1020 Biological Waste Water Treatment

Curriculum period	2025-2026
Validity period	1 Jul 2025-30 Sep 2026
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Chemical Engineering 100%
Responsible persons	Armi Rissanen, Administrative person Susana Rodriguez Couto, Responsible teacher Mika Mänttäri, Responsible teacher Marika Kokko, Responsible teacher
Study level	Basic studies

Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: BJ03A01010 Introduction to Advanced Water Treatment is recommended or corresponding knowledge.

Equivalences to other studies

BJ04A6010 Biological Waste Water Treatment in Biorefining

Learning outcomes

EN: After completing the course the student will have the basic knowledge of aerobic and anaerobic biological treatment processes. He/she will master the basic principles, terminology, reactor configurations, and related calculations of both processes. He/she understands the context of the biological waste water treatment processes to recycling of nutrients, bioenergy production and recovery and production of value-added compounds from waste waters and organic wastes. In addition, the student will after completing the course use the available literature in his/her research work, act as a part of a project work group and evaluate his/her own performance and communicate in a professional way in the project group.

Content

EN: Biological wastewater treatment methods, professional terminology, built-up ecosystem, desired metabolism and reactor types, selection of microbes and enrichment, influence of temperature and other conditions on above-mentioned factors, basic knowledge on the biological methods used in removal of carbon, nitrogen and phosphorous, aerobic and anaerobic wastewater treatment, process alternatives and technologies, designing and operating modes of processes, controlling and optimization of processes, novel technologies, recovery of valuable products from waste originating (secondary raw materials) raw materials, aerobic and anaerobic technologies in the treatment of sewage sludges and organic wastes.

Additional information

EN: Suitable for doctoral studies.
The course is related to UN's Sustainable Development Goals (SDG): 6 clean water and sanitation, 11 sustainable cities and communities

Study materials

EN: Lecture material and additional material (Moodle), literature announced during the course.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 1. period-Summer	5 cr
Course Completion		5 cr

BJ02A0011 Laboratory Work Course in Chemical Technology

BJ02A0011 Laboratory Work Course in Chemical Technology

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	10 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Chemical Engineering 100%
Responsible persons	Armi Rissanen, Administrative person Ritva Tuunila, Responsible teacher
Study level	Basic studies

Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: In case of laboratory work laboratory safety training organized by the department is required before starting any experiments.

Compulsory prerequisites

BJ02A0060 Laboratory Safety Course

Learning outcomes

EN: Upon completion of the module, the student will be able to carry out independently a small research project (the content of the module varies).

Content

EN: A specific project will be done in one of the laboratories of the department. The project is planned together with the supervisor(s) and consists mainly of laboratory work, literature work and report writing. The course may contain lectures and seminars. The project may also be planned together with industry and then carried out at an industrial location.

Additional information

EN: The course is intended for pre-planned study visits prior agreed with a supervising professor. The students planning to register for the course must contact head of degree programme and possible supervisor beforehand. To be able to start work in the laboratory a student must take and pass laboratory safety training.
The course is related to UN's Sustainable Development Goals (SDG): 6 clean water and sanitation, 9 industry, innovation and infrastucture, 13 climate action

Study materials

EN: Literature related to the project.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 1. period-2. period Recurrence 2: 3. period-4. period	10 cr
Course Completion		10 cr

BJ02A0012 Advanced Laboratory Course in Chemical Technology

BJ02A0012 Advanced Laboratory Course in Chemical Technology

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	30 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Chemical Engineering 100%
Responsible persons	Armi Rissanen, Administrative person Ritva Tuunila, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Compulsory prerequisites

BJ02A0060 Laboratory Safety Course

Learning outcomes

EN: Upon completion of the module, the student will be able to carry out independently a small research project (the content of the module varies).

Content

EN: A specific project will be done in one of the laboratories of the department. The project is planned together with the supervisor(s) and consists mainly of laboratory work, literature work and report writing. The course may contain lectures and seminars. The project may also be planned together with industry and then carried out at an industrial location.

Additional information

EN: The course is intended for pre-planned study visits prior agreed with a supervising professor. The students planning to register for the course must contact head of degree programme and possible supervisor beforehand. To be able to start work in the laboratory a student must take and pass laboratory safety training.
The course is related to UN's Sustainable Development Goals (SDG): 6 clean water and sanitation, 9 industry, innovation and infrastucture, 13 climate action

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 1. period-2. period Recurrence 2: 3. period-4. period	30 cr
Course Completion		30 cr

BJ04A7010 Bioeconomy

BJ04A7010 Bioeconomy

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Chemical Engineering 100%
Responsible persons	Armi Rissanen, Administrative person Ikenna Anugwom, Responsible teacher Mikko Rahtola, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: By the end of the course, the student is expected to
- gain the basic understanding of various perspectives of bioeconomy
- gain updated knowledge of modern biorefineries and the basic prerequisites for operation and sustainable business.

Content

EN: The study entities are: The multidimensional impact of bioeconomy on Europe, the implementation of bioeconomy, the sustainability – all three dimensions - aspects of bioeconomy. The course is carried as assignments based on selected topics from the book and additional material. Course is planned for distance learning.

Study materials

EN: Book: A Sustainable Bioeconomy The green industrial revolution by Professors Mika Sillanpää and Chaker Ncibi. Other related material announced later.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 1. period-2. period, Summer, Summer	5 cr
Course Completion		5 cr

BJ02A6020 Power-to-X processes

BJ02A6020 Power-to-X processes

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Chemical Engineering 100%
Responsible persons	Armi Rissanen, Administrative person Emma Laasonen, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: Upon completion of the module students will have an overview of the current trends in chemical industry to replace fossil-based products with products manufactured from renewable electricity.

Content

EN: The course covers recent topics in chemical engineering related to energy transformation, including generation of renewable hydrogen, carbon capture and utilization, E-fuels, Power-to-X processes, and carbon neutral products and processes.

Additional information

EN: Full digi

The course is related to UN's Sustainable Development Goals (SDG):

no poverty, zero hunger, good health and well-being, quality education, gender equality, clean water and sanitation, affordable and clean energy, decent work and economic growth, industry, innovation and infrastructure, reduced inequalities, sustainable cities and communities, responsible consumption and production, climate action, life below water, life and land, peace, justice and strong institutions, partnership for the goals.

Study materials

EN: Material given by the teacher

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 1. period-4. period	5 cr
Course Completion		5 cr

BM20A3003 Statistical Parameter Estimation

BM20A3003 Statistical Parameter Estimation

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Computational Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Lassi Roininen, Responsible teacher Janne Penttilä, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Tweet text

EN: Parameter estimation in the sense of Bayesian estimation theory

Prerequisites

EN: Basics of statistics, linear algebra, and differential equations.

Compulsory prerequisites

BM20A8501 Probabilistic Simulation

Equivalences (free text field)

EN: BM20A3002 Statistical Analysis in Modelling

Learning outcomes

EN: Bayes theorem, hierarchical models, stochastic processes, MCMC, Kalman and particle filters

Content

EN: - Preliminaries of stochastic processes: Brownian motion, fractional Brownian motion, and Ornstein-Uhlenbeck process.
- Simulation of the processes, additive noise processes and postulating the statistical parameter estimation problems as Bayesian statistical estimation problems.

- Bayes' theorem: Solutions of the parameter estimation problems as a posteriori distributions, e.g. estimate the a posteriori probability density of Hurst parameter and variance scaling parameter of the fractional Brownian motion.

- Drawing estimators from the posterior distribution with Markov chain Monte Carlo methods (Metropolis-Hastings, Hamiltonian Monte Carlo) and optimisation-based methods (quasi-Newton). This includes also uncertainty quantification of the parameters.

- Applications in science, finance and industry.

The course is related to UN's Sustainable Development Goal (SDG): 4 Quality Education.

The course is related to industry and employment: Research and Development.

Study materials

EN: Andrew Gelman, John Carlin, Hal Stern, David Dunson, Aki Vehtari, and Donald Rubin, Bayesian Data Analysis, 2021.
Simo Särkkä, and Arno Solin, Applied Stochastic Differential Equations, 2019.

Simo Särkkä, Bayesian Filtering and Smoothing, 2013.

Christian P Robert, and George Casella, Monte Carlo Statistical Methods, 2004.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period	5 cr
Course Completion		5 cr

BM20A4703 Partial Differential Equations with Applications

BM20A4703 Partial Differential Equations with Applications

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Computational Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Duc-Lam Duong, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Good command of calculus and linear algebra, basic knowledge of ODE and PDE problems and their analytical solutions, basic knowledge of functional analysis and possible numerical methods used for ODE solutions.

Recommended prerequisites

BM20A7601 Numerical Methods for Partial Differential Equations

Equivalences (free text field)

EN: BM20A4701 Modelling with Partial Differential Equations

Learning outcomes

EN: After completing the course, students will be able to

- understand the principles of modelling using PDEs and their applications in various fields
- know basic PDEs such as the heat equation, wave equations, scalar conservation laws and how to derive them

- get hold of popular methods to solve PDEs, such as the method of characteristics, separation of variables, using the Fourier transform, and in general using ODEs to solve PDEs.
- know some advanced topics such as Sobolev spaces, Sobolev embeddings and their applications in the modern study of PDEs. Concrete examples include the analysis of Navier-Stokes equations in fluid mechanics. Weak formulation, existence with the Galerkin method, uniqueness and regularity.
- understand the fundamentals of PDEs which in turn helps students to better prepare for more advanced numerical methods courses where theoretical analysis is essential.

Content

EN:

- Partial differential equations in mathematical modeling
- Heat equations
- Nonlinear conservation laws
- Wave equation
- Sobolev spaces and Sobolev embeddings
- Fluid mechanics and Navier-Stokes equations

Additional information

EN: Opportunities: Attending this course can open doors to employment in engineering (companies like Boeing, Airbus), finance and insurance (JPMorgan), computing, machine learning and AI (Google, NVIDIA, IBM), healthcare, and environmental industries (FMI, NASA), etc.
The course is related to UN's Sustainable Development Goals (SDG):

3 good health and well-being
4 quality education
5 gender equality
6 clean water and sanitation
9 industry, innovation and infrastructure
10 reduced inequalities
13 climate action
14 life below water
15 life and land

Study materials

EN:

- Craig, *A course on Partial Differential Equations*, AMS, 2018.
- Evans, *Partial Differential Equations*, AMS, 2nd, 2010.
- Salsa, *Partial Differential Equations in Action: From Modelling to Theory*, Springer, 2008.
- Smoller, *Shock Waves and Reaction-Diffusion Equations*, Springer, 1994.
- Robinson, *Infinite-dimensional dynamical systems*. Cambridge University Press, 2001.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period	5 cr
Course Assessment		5 cr
Course Registration		0 cr

BM40A1401 GPU Computing

BM40A1401 GPU Computing

Curriculum period	2025-2026
Validity period	since 1 Aug 2025

Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Computational Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Henri Petrow, Responsible teacher Lasse Lensu, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Ability to program in Python

Recommended prerequisites

BM40A0702 Pattern Recognition and Machine Learning

Learning outcomes

EN: The student is able to 1) understand the key components of graphics processing units (GPUs) and their advantages and limitations in general-purpose computing, 2) implement GPU-accelerated algorithms at different abstraction levels of programming and artificial intelligence in the form of machine learning on a GPU, 3) appropriately select either central processing unit or GPU execution for specific tasks and 4) carry out GPU computing engineering projects.

Content

EN: Components of GPUs and their architectural differences affecting GPU computing. Low-level programming interfaces with the focus on Compute unified device architecture (CUDA). Intermediate-level programming libraries with GPU acceleration. High-level library for employing GPUs for machine learning. Project work focusing on a GPU-accelerated task implemented using the introduced abstraction levels of programming with C++ and Python.
Company cooperation: no direct cooperation.
Use of AI applications: readily available AI tools can be used for checking the language of written reports.

Additional information

EN: ***The course is related to UN's Sustainable Development Goals (SDG): 8 decent work and economic growth, 9 industry, innovation and infrastructure

Study materials

EN:

- Popular GPU-accelerated Applications, http://www.nvidia.com/docs/IO/123576/nv-applications-catalog-lowres.pdf
- CuPy Docs, https://docs.cupy.dev/en/stable/
- PyTorch Docs, https://pytorch.org/docs/
- Other materials will be announced during the course.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr

BM40A0902 3D Computer Vision

BM40A0902 3D Computer Vision

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Computational Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Tuomas Eerola, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Recommended: BM40A1601 Foundations of Artificial Intelligence and Machine Learning (or BM40A0502 Johdatus laskennalliseen älykkyyteen ja koneoppimiseen), BM40A1201 Digital Imaging and Image Preprocessing, BM40A0702 Pattern Recognition and Machine Learning, BM40A0801 Machine Vision and Digital Image Analysis

Recommended prerequisites

BM40A0702 Pattern Recognition and Machine Learning

BM40A0801 Machine Vision and Digital Image Analysis

BM40A1201 Digital Imaging and Image Preprocessing

BM40A1601 Foundations of Artificial Intelligence and Machine Learning

Learning outcomes

EN: A student knows the theoretical basis of geometric (3D) and dynamic computer vision, and is able to apply the knowledge to solve practical problems in computer vision. A student is able to explain basic approaches and applications for image processing and local feature extraction for images, and video sequences. A student is able to design and implement applications for challenges in computer vision.

Content

EN: Overview for imaging and image preprocessing. Local image features. Camera calibration. Frames and geometrical primitives. Computer vision for 3D scenes. Single and multi-view geometry. Dynamic vision and tracking. Structure from motion.

Company cooperation

No company cooperation

Additional information

EN: ***
The course is related to UN's Sustainable Development Goals (SDG): 9 industry, innovation and infrastructure

Study materials

EN: Richard Hartley, Andrew Zisserman: Multiple View Geometry in Computer Vision, 2nd Edition. Cambridge University Press, 2004.
Richard Szeliski: Computer Vision: Algorithms and Applications, 2nd edition. Springer, 2022.

Emanuele Trucco, Alessandro Verri: Introductory Techniques for 3-D Computer Vision. Prentice Hall, 1998.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Registration		0 cr
Course Assessment		6 cr

BM20A3401 Design of Experiments

BM20A3401 Design of Experiments

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	4 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Computational Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Satu-Pia Reinikainen, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Tweet text

EN: Fouundations of experimental design and methods.

Prerequisites

EN: First year university calculus, BM20A1401 Tilastomatematiikka I/basic statistics. Basic (Matlab) skills for technical computing with PC.

Learning outcomes

EN: After the course, the student is expected to master the basic skills for effective experimentation, and regression analysis and basic analyses of variance (ANOVA):
- understanding of the importance of designed experiments
- ability to apply the basic experimental plans, and regression techniques to analyse the results
- skills to optimize an engineering process using design of experiments and data analysis.

Content

EN: Importance of experimental design, minimization of prediction uncertainty of regression models. Basic factorial designs: 2N, Central Composite designs for regression analysis. Screening designs. Response surfaces. Experimental optimisation and uncertainty estimation.

Additional information

EN: In addition to lectures and assignments, students make a project work in which the they apply and report a statistical design of experiments in practice. The course is related to UN's Sustainable Development Goals (SDG): 9 industry, innovation and infrastucture.

Study materials

EN: Box, G., Hunter, S., Hunter, W. G.: Statistics for Experimenters, Wiley 2005, 2nd Edition.
Montgomery, D. C.: Design and Analysis of Experiments, Wiley 2013, 8th Edition.

Lecture notes

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 4. period	4 cr
Course Completion		4 cr

BM20A7700 Special Course on Inverse Problems

BM20A7700 Special Course on Inverse Problems

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Computational Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Tapio Helin, Responsible teacher Chuntao Chen, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Tweet text

EN: This course discusses advanced topics related to inverse problems.

Compulsory prerequisites

BM20A7401 Inverse Problems

BM20A7300 Functional Analysis

Learning outcomes

EN: After the course, the student
- understands principles that govern statistical approach to inverse problems and

- is able to carry out basic computational inference given a statistical inverse problem.

Content

EN: This course is continuation to the course "BM20A7400 Introduction to inverse problems". Here, we discuss advanced topics related to inverse problems. This course includes contents describing statistical approach to inverse problem that vary from year to year.

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG): 4 quality education, 9 industry, innovation and infrastucture.

Study materials

EN: Lecture-notes/slides based on various resources. Recommended reading includes:
* Kaipio and Somersalo (2005): Statistical and Computational Inverse Problems. Springer.

* Tenorio (2017): An Introduction to Data Analysis and Uncertainty Quantification for Inverse Problems. SIAM.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period	5 cr
Course Completion		5 cr

BM40A0801 Machine Vision and Digital Image Analysis

BM40A0801 Machine Vision and Digital Image Analysis

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Computational Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Xin Liu, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Recommended BM40A0702 Pattern Recognition and Machine Learning, BM40A1201 Digital Imaging and Image Preprocessing, BM40A0502 Johdatus laskennalliseen älykkyyteen ja koneoppimiseen.

Recommended prerequisites

BM40A0702 Pattern Recognition and Machine Learning

or

BM40A1201 Digital Imaging and Image Preprocessing

Learning outcomes

EN: After the course a student is expected to be able to explain the fundamental steps of image processing and analysis, to introduce and compare machine vision applications, to plan a solution to a given object recognition problem, and to implement practical solutions for machine vision problems using Matlab, Python, or other suitable programming language.

Content

EN: Digital image processing: digital image, image transforms, image enhancement. Image analysis: segmentation, video foreground detection. Deep learning: Convolutional Neural Network, Graph Neural Network, Graph Convolutional Network, Recurrent Neural Network, Unsupervised Learning, Transfomer networks, Large Language Model, and Multimodal Large Language Models. Hardware, software and applications.

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG): 9 industry, innovation and infrastucture.

Study materials

EN: References and material published on the course web page.

Literature

Gonzalez, R.C., Woods, R.E., Digital Image Processing, 3rd and 4th editions, 2008 and 2018.

Zhang, A., Lipton, Z. C., Li, M., & Smola, A. J. (2023). Dive into deep learning. Cambridge University Press.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Registration		0 cr
Course Assessment		6 cr

BM20A3700 Statistical learning

BM20A3700 Statistical learning

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Computational Engineering 100%
Responsible persons	Tapio Helin, Responsible teacher Jonna Naukkarinen, Administrative person Abhishake Abhishake, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Tweet text

EN: This course describes foundations of statistical learning.

Prerequisites

EN: Basic knowledge on probability theory

Recommended prerequisites

BM20A7300 Functional Analysis

Learning outcomes

EN: The student learns classification and regression methods in machine learning and their theoretical foundation. The course strengthens abilities to prove rigorous statements.

Content

EN: Statistical learning refers to a field of machine learning drawing from statistics and functional analysis. Statistical learning focuses on developing and studying methods, algorithms, and models for making predictions or decisions based on data. Statistical learning is widely applied in various domains, including finance, healthcare, natural language processing, computer vision, and bioinformatics. We will discuss the algorithms for classification and regression such as SVM, Nearest Neighbor, Regularization Methods, and Kernel Methods.

Additional information

EN: ***
The course is related to UN's Sustainable Development Goals (SDG): 9 industry, innovation and infrastructure

Study materials

EN: Lecture notes.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 4. period	5 cr
Course Registration		0 cr
Course Assessment		5 cr

BM20A5300 Computational Spectroscopy

BM20A5300 Computational Spectroscopy

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Computational Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Satu-Pia Reinikainen, Responsible teacher Erik Vartiainen, Responsible teacher Zina-Sabrina Duma, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Tweet text

EN: The primary aim of this course is to teach the mathematical and computational methods needed to connect understanding optical spectroscopy with data analysis.

Prerequisites

EN: Ability to program in Matlab, Julia or Python.

Recommended prerequisites

BM20A6100 Advanced Data Analysis and Machine Learning

Learning outcomes

EN: The student is able to 1) understand basics of optical spectroscopy, and (chemical) spectral characterisation, 2) apply and use state-of-the-art methods for spectra analysis, and 3) apply the studied methods to practical applications 4) report findings in a scientific manner 5) group work skills

Content

EN: Course starts with introduction to foundations of optical spectroscopy (such as FT-IR, Raman, VIS-NIR hyperspectal imaging) and the spectra characteristics, interferences and common pre-treatment methodologies. Participants will focus on one of the advanced methods in spectra analyses:
1) hyperspectral imaging

2) real-time data methods

3) modern methods for spectra characterisation

4) other topics that are widely applied in chemical calibration, process monitoring, and environmental remote sensing.

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG): SDG9 Industry, Innovation, Technology and Infrastructure, and SDG13 Climate action.

Study materials

EN: Lecture material, recorded videos and demonstrations in Moodle and additional literature.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 4. period	5 cr
Course Completion		5 cr

BL20A1400 Renewable Energy Technology

BL20A1400 Renewable Energy Technology

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Electrical Engineering 100%
Responsible persons	Minna Loikkanen, Administrative person Christian Breyer, Responsible teacher Ashish Gulagi, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Basic background knowledge in energy related concepts and engineering mathematics.

Learning outcomes

EN: Upon completion of the course, the student will be able to:
1. Identify the major renewable energy conversion technologies, mainly converting resources to electricity.

2. Describe the major characteristics of the technologies, in particular applications, efficiency, economics, industrial scale and future prospects.

3. Analyse the need for storage technologies and their different fields of application based on their key technical and economic features.

Content

EN: The course will cover the following topics.
1. Focussing on the conversion technologies related to different renewable energy resources.

2. The renewable energy technologies discussed in the course are: wind turbines, solar photovoltaics, and solar thermal electricity generation.

3. The storage technologies covered comprise a general overview and include battery storage, pumped hydro energy storage and power-to-X technologies, in particular for e-fuels.

4. Introduction of renewables-based carbon dioxide removal options.

5. Application cases are shown for the case of island systems.

6. All technologies are classified with respect to their applications, efficiency, maturity, economics, industrial scaling and expected relevance for the ongoing energy transition.

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG): 7 affordable and clean energy, 13 climate action

Study materials

EN: The learning material is based on the latest research and is distributed to students in Moodle
1. Lecture slides are shared with additional reading links provided at the end of the slides.

2. Exercise class calculations and solutions will be shared in Moodle.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Assessment		6 cr
Course Registration		0 cr
Method 2	Recurrence 1: 3. period-4. period	6 cr
Course Assessment		6 cr
Course Registration		0 cr

BL30A1310 Advanced Power Electronics

BL30A1310 Advanced Power Electronics

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Electrical Engineering 100%
Responsible persons	Minna Loikkanen, Administrative person Aleksi Mattsson, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: BL30A1300 Power Electronic Converters

Equivalences to other studies

BL30A0600 Power Electronics

Learning outcomes

EN: Student will be equipped with knowledge in: 1. determining the stresses that switches experience in different converter circuits and thereby selecting suitable semiconductors for specific applications 2. Identify applications suitable for wide band gap technology 3. understanding basic gate driver circuit operation and principles of their design, 4. selecting different converter topologies for different applications recognize each benefits, 5. ability to independent design work using available tools.

Content

EN: Operation of wide band gap semiconductors and main differences with Si based switches. Switch technologies for different power ranges. Gate driver circuits for main switch types. Multilevel converters topologies and their operation. Soft-switching power converters. Advanced modulation methods (SVPWM and its variations). Modelling and simulation of power electronic converters using Matlab/Simulink, and PLECS. Selected topics in the field of power electronics that are active in research.
Use of AI applications

AI applications can be used for understanding concepts and searching for information, taking into account the constraints of the AI in source criticism. Students have to provide the answers in weekly tasks and the final assignment by own produced text. Students are not allowed to present AI-generated text as their own.

Additional information

EN: Course is held fully online
SDG: 7 affortable and clean energy

Study materials

EN: The learning material is based on the latest research and is distributed to students in Moodle. Study material includes lecture slides and lecture videos. The following literature is also relevant to the course content:
Fundamentals of Power Electronics
Robert W. Erickson, Dragan Maksimović, 2020 (third edition)

Fundamentals of Power Semiconductor Devices
Baliga, B. Jayant, 2019

High-Power Converters and AC Drives
Bin Wu, 2006

Pulse Width Modulation for Power Converters: Principles and Practice
D. Grahame Holmes, Thomas A. Lipo, 2003

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr
Method 2	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr

BL30A1321 Modelling and Control of Power Electronic Converters

BL30A1321 Modelling and Control of Power Electronic Converters

Abbreviation: MCPEC

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English

Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Electrical Engineering 100%
Responsible persons	Pasi Peltoniemi, Responsible teacher Minna Loikkanen, Administrative person
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Recommended: BL40A1300 Power Electronic Converters, BL40A0200 Säätötekniikan perusteet

Recommended prerequisites

BL40A1203 Digital Control 2

Learning outcomes

EN: After completing the course the student has 1. Ability to model system using available circuit simulator software or by deriving analytic models using state-space approach. 2. Recognize the needed level of model detail for specific studies 3. Understand the basic control concepts for AC-DC and DC-AC converters. 4. Ability to define parameters for different controllers in basic applications.

Content

EN: Modelling of passive components in circuit simulators. Modelling of electric grid and electrical machines for system simulations and control system tuning using available software. Synchronous reference frames. Phase locked loop methodologies. Current vector control and tuning for grid converters and electrical machine drives. Control decoupling. Cascade control loop (i.e. voltage, flux, speed) tuning methods.

Additional information

EN: Company cooperation
Visiting lecture
Use of AI applications

Artificial intelligence applications can be used according to general policies of LUT, for example, for creating a big picture and structuring things, creating and sketching ideas, understanding concepts and searching for information within constraints, and improving grammar, text and style according to the assignment.

Study materials

EN: The learning material is based on the latest research and is distributed to students in Moodle
Krause, P. C., et al “Analysis of Elecric Machinery and Drive Systems” second edition, Wiley, IEEE

Buso, S., Mattavelli, P., “Digital control in Power Electronics”, Morgan & Claypool, 2006

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	5 cr
Course Completion		5 cr
Method 2	Recurrence 1: 3. period-4. period	5 cr
Course Completion		5 cr

BL40A2401 Electrical Engineering in Wind and Solar Systems

BL40A2401 Electrical Engineering in Wind and Solar Systems

Curriculum period	2025-2026

Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Electrical Engineering 100%
Responsible persons	Minna Loikkanen, Administrative person Katja Hynynen, Responsible teacher Antti Kosonen, Responsible teacher Altti Meriläinen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Previous knowledge of electrical engineering required. Basics of electrical machines and/or transmission of electricity recommended.

Learning outcomes

EN: Upon completion of the course the student is able to:
1. Describe the functional principle of wind or solar power plants,
2. describe and identify electrotechnical components and system layouts in wind and solar power plants,
3. dimension the electrotechnical components in wind and solar power plants,
4. describe and analyse the control systems of wind and solar power plants,
5. describe and analyse the grid connection requirements of wind and solar power plants,
6. Describe and analyse the interaction between the grid and wind/solar power plant in different abnormal situations.

Content

EN: - Drive train technologies in wind power systems, permanent magnet synchronous generator drive train, double-fed induction generator drive train,
- Electric conversion in PV solar power,
- System topologies and power electronics solutions in small and utility scale PV solar plants.
- Control of a wind and solar power plant,
- Electrical protection of wind and solar power plants.
- Technical requirements in grid connection,
- Grid codes, other international regulations and standards in wind and solar power systems.
- Voltage and reactive power control in wind and solar power plants,

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG): 7 affortable and clean energy

Study materials

EN: Lecture material and videos in moodle.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr
Method 2	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr

BL40A3021 Technologies for Electrochemical Energy Conversion and Storage of Electricity

BL40A3021 Technologies for Electrochemical Energy Conversion and Storage of Electricity

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Electrical Engineering 100%
Responsible persons	Minna Loikkanen, Administrative person Pertti Kauranen, Responsible teacher Aki Grönman, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Introduction to electrochemical energy storages and conversion technologies

Recommended prerequisites

BL40A3010 Introduction to Electrochemical Energy Storage and Conversion Technologies

Equivalences to other studies

BL40A2910 Electric Energy Conversion Systems

Learning outcomes

EN: Upon completion of the course the student will be able to:
1. identify the main components in electrochemical energy storage and conversion systems,
2. dimension the system components in electrochemical energy storage and conversion systems,
3. analyze the control systems in electrochemical energy storage and conversion systems,
4. know the basics of relevant regulations, norms, and standards in electrochemical storage and conversion systems.

Content

EN: The course provides the student the ability to design and analyse the battery energy storages and water electrolysis plants at system level.
The student will learn how to model the systems and study the energy efficiency and dynamics of the systems.

Study materials

EN: Lecture notes and videos

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	5 cr
Course Completion		5 cr

BL20A0101 Thermal Design of an Electric Device

BL20A0101 Thermal Design of an Electric Device

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English, Finnish
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Electrical Engineering 100%
Responsible persons	Janne Nerg, Responsible teacher Minna Loikkanen, Administrative person
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Tweet text

EN: Location: Lappeenranta

Learning outcomes

EN: Upon completion of the course the student will be able to 1. perform thermal design of a simple electronic device, 2. describe the heat transfer mechanisms and 3. analytically calculate temperature distribution of an electronic device.

Content

EN: Heat transfer mechanisms, cooling methods of electronic devices, the effect of operating temperature on the performance of an electronic device, thermal resistance networks, analytical thermal calculations, and cooling methods of electrical machines.

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG): 7
affordable and clean energy

Study materials

EN: Lecture materials are available in Moodle. The course is based on selected parts of the following books: Incropera, DeWitt, Fundamentals of heat and mass transfer; Hagen, Heat transfer with applications; Cengel, Heat transfer: A practical approach, and Pyrhönen, Jokinen, Hrabovcova: Design of Rotating Electrical Machines.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period	3 cr
Course Completion		3 cr
Method 2	Recurrence 1: 3. period	3 cr
Course Completion		3 cr

BL40A1203 Digital Control 2

BL40A1203 Digital Control 2

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr

Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Electrical Engineering 100%
Responsible persons	Minna Loikkanen, Administrative person Niko Nevaranta, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: Upon completion of the course students are able to design a model-based digital control system for industrial application independently. The necessary skills are dynamic plant modeling, system design, control synthesis, system simulation and digital controller implementation in an industrial control platform.

Content

EN: The teaching approach in this course emphasizes practical control design and the structures of model-based control laws. The first half of the course introduces design of state space-based control laws for different example applications. The following topics are covered in the course: plant modelling, different state-space and transfer functions algorithms for SISO and MIMO systems, digital controller synthesis, system simulation, controller programming and testing. In the second half of the course every student will design, program and test a controller using an industrial controller platform and a laboratory equipment.

Additional information

EN: This course can be studied remotely (lectures are provided locally and pre-recorded videos is found from course platform). The course material is given in Moodle-environment.
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'7 affortable and clean energy'/'7 edullista ja puhdasta energiaa'

Study materials

EN: Lecture script and handout, more detailed material in the text books: Franklin G.F., Powell J.D., Workman M.L., Digital Control of Dynamic Systems, Addison-Wesley, 1998, Kuo B., Digital Control Systems, 2nd ed., Oxford University Press, 1992, Åström K.J., Wittenmark B., Computer Controlled Systems, 3rd ed., Prentice Hall, 1997, 557 p.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr
Method 2	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr

BL40A1601 Embedded System Design

BL40A1601 Embedded System Design

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Electrical Engineering 100%

Responsible persons	Minna Loikkanen, Administrative person Tuomo Lindh, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Basics of digital design and digital electronics, basics of programming.

Learning outcomes

EN: Upon completion of the course the student will be able to program with VHDL hardware design language and design and implement digital systems by using programmable logic circuits.

Content

EN: Circuit design of digital electronics with programmable logic circuits. Principles of digital circuit design, system level synthesis, hardware design languages.
Use of AI applications:
AI may be used for information gathering but is prohibited for any other purpose. Copy-pasting from sources is not allowed
unless explicitly permitted for a specific task.

Additional information

EN: Blended learning
SDG: 7 affortable and clean energy

Study materials

EN: To be announced in class.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr
Method 2	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr

BL40A2302 Energy Efficiency

BL40A2302 Energy Efficiency

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	4 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Electrical Engineering 100%
Responsible persons	Jero Ahola, Responsible teacher Minna Loikkanen, Administrative person
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: Upon completion of the course the student will be able to: 1. determine actions for the energy efficiency of the energy conversion process, 2. estimate the overall energy efficiency of the energy conversion system, 3. identify applications of electric energy usage and apply methods that can be used to improve the energy efficiency.

Content

EN: The course provides the student with an introduction to the significance and development potential of energy efficiency in energy production, transmission, distribution and end use. The focus is on electric energy and systems approach. The lecture topics are the efficiency of energy production processes, the efficiency of electricity transmission and distribution and the efficiency of energy end use. The course is arranged as a series of lectures delivered by experts. The lecture topics may vary from year to year.

Additional information

EN: The course is suitable for distance learning.

Study materials

EN: Lecture material in Moodle.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 4. period	4 cr
Course Completion		4 cr
Method 2	Recurrence 1: 4. period	4 cr
Course Completion		4 cr

BH40A1501 Turbulence Models

BH40A1501 Turbulence Models

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	4 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Energy Technology 100%
Responsible persons	Minna Loikkanen, Administrative person Teemu Turunen-Saaresti, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: BH40A1560 Fundamentals of Computational Fluid Dynamics or equivalent knowledge./Ed. 26.9.18/ml

Learning outcomes

EN: Upon completion of the course the student will be able to recognize the characteristics of turbulence models and to estimate the suitability of different turbulence models for various fluid mechanical problems. In addition, the student will be able to interpret the physical basis and the theory of turbulence models.

Completion of the course supports the development of the following generic competences for working life: Mathematics and natural sciences, Written and oral communication, Team working skills, Time management and prioritizing tasks

Content

EN: Navier-Stokes equations, RANS equations, Reynolds stress, eddy viscosity, algebraic, one equation and two equation models and advanced models.

Additional information

EN: Suitable for doctoral studies.
The course is related to UN's Sustainable Development Goals (SDG): 6 clean water and sanitation, 7 affordable and clean energy

Study materials

EN: David C. Wilcox: Turbulence models for CFD.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	4 cr
Course Completion		4 cr

BH40A1570 Advanced Computational Fluid Dynamics

BH40A1570 Advanced Computational Fluid Dynamics

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Energy Technology 100%
Responsible persons	Minna Loikkanen, Administrative person Teemu Turunen-Saaresti, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: BH40A1560 Fundamentals of Computational Fluid Dynamics or equivalent knowledge.

Compulsory prerequisites

BH40A1560 Fundamentals of Computational Fluid Dynamics

Equivalences to other studies

BH40A1550 Computational Fluid Dynamics Workshop

Learning outcomes

EN: The aim of the course is to acquaint students with the numerical simulations of multiphase and real gas flows, phase change, advance heat transfer (multi-fluid) and turbomachinery. After completing the course, students are able to simulate above-mentioned flows using a CFD software and write own functions to a CFD software. In addition, students are able to identify the limitations and simplifications of numerical simulations related to problems.

Completion of the course supports the development of the following generic competences for working life: Mathematics and natural sciences, Oral communication, Team working skills, time management and prioritizing tasks.

Content

EN: Advanced topics of computational fluid dynamics. Multiphase flows. Real gas models. Phase change. Multi-fluid heat transfer. Turbomachinery. Meshing. Implementation of functions to a CFD software. Transient multi-domain simulation.

Additional information

EN: Suitable for doctoral studies.
The course is related to UN's Sustainable Development Goals (SDG): 7 affordable and clean energy.

Study materials

EN: Material in course's Moodle page. Notes done by the lecturers.

Literature

Multiphase Flow Handbook, chapter 13, Edited By Clayton T. Crowe, 1st edition, CRC Press

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	5 cr
Course Completion		5 cr

BH40A1800 Steam Turbines

BH40A1800 Steam Turbines

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Energy Technology 100%
Responsible persons	Aki Grönman, Responsible teacher Minna Loikkanen, Administrative person
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Recommended course BH40A0802 Fluid Machinery or similar knowledge.

Learning outcomes

EN: Upon completion of the course the students are able to: 1. Understand how the size of the turbine affects the design 2. Understand what requirements different power plants have for steam turbines and how turbines are connected to other parts of the plant 3. Understand the fundamentals of condensation in steam turbines 4. Understand the aerodynamic design principles of steam turbines. The course supports learning of the following work life expertise and skills: Mathematics and natural sciences, practical application of theories, working independently, problem solving, information retrieval, time management and prioritizing tasks, analytical thinking skills.

Content

EN: Influence of turbine size on the design and construction, turbines in different power plants, condensation in turbines, steam turbine aerodynamics, hood/retrofit, and condenser.

Additional information

EN: Suitable for doctoral studies. The course is related to SDG 7: affordable and clean energy.

Study materials

EN: Lecture material in Moodle.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period	3 cr
Course Completion		3 cr

BH50A1701 District Heating

BH50A1701 District Heating

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	4 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Energy Technology 100%
Responsible persons	Minna Loikkanen, Administrative person Jussi Saari, Responsible teacher Satu Lipiäinen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Basic knowledge of heat transfer, fluid dynamics and power plant engineering recommended

Learning outcomes

EN: Upon completion of the course the student will be able to 1. describe the basics of district heating in the world and in Finland, 2. explain the technical solutions of generating and delivering district heating at a detailed level, do engineering design to 3. dimension heat output and annual thermal energy necessary for various heating applications, 4. understand and calculate various losses, 5. evaluate the basic design and use of district heating networks and heat production.

Content

EN: The formation of energy demand in buildings and the consumption variation. Consumer devices, connections and energy measurement. Abitility to calculate piping losses, and understand principles of piping and network planning and control. Production of district heating, district heating plants and heating power plants.

Additional information

EN: SDGs: 6 clean water and sanitation, 7 affordable and clean energy, 11 sustainable cities and communities, 13 climate action

Study materials

EN: Lecture notes.

Literature

Koskelainen, Lasse et al.: Kaukolämmön käsikirja. Energiateollisuus, 2006.
Frederiksen, Svend and Werner, Sven: District Heating and Cooling. Studentlitteratur, 2014.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	4 cr
Course Completion		4 cr

BH50A2200 Bioenergy and Energy Use in the Forest Industry

BH50A2200 Bioenergy and Energy Use in the Forest Industry

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Energy Technology 100%
Responsible persons	Minna Loikkanen, Administrative person Falah Alobaid, Responsible teacher Katja Kuparinen, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Equivalences to other studies

BH61A0500 Energy Economics in Wood Processing Industry

Learning outcomes

EN: Upon completion of the course the students will be able to recognize the importance of forest industry to economy, can describe processes used, understands the role of biomass, recycling and bioenergy, can evaluate and understand the energy use of basic processes, explain the importance of energy procurement for profitability of forest industry mill. Understands the factors that determine effective energy use and production. Can draw the energy procurement plan for a forest industry mill.
Completion of the course supports the development of the following generic competences for working life: practical application of theories, basics of business operations, analytical thinking skills, working independently, problem solving, visual communication, time management and prioritizing tasks.

Content

EN: Principles of producing chemical kraft pulp and process energy use. Importance of bioenergy and biofuels in forest industry. Biorefineries. Project planning and execution. Engineering design. Students develop energy procurement plan for given forest industry mill through team and project work. Modelling of the power plant for the planning. Energy use for plant subprocesses. The dimensioning and optimisation of energy delivery. Thermal engineering simulation. Compare factors affecting the power plant economics. Documentation of results.

Additional information

EN: contact teaching

industrial visit***
The course is related to UN's Sustainable Development Goals (SDG): 7 affordable and clean energy, 13 climate action

Study materials

EN: Lecture notes. https://forestbiofacts.com/energy-and-biofuels/

Literature

ForestBioFacts learning environment
https://forestbiofacts.com/

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Registration		0 cr
Course Assessment		6 cr

BH61A0201 Energy Economics

BH61A0201 Energy Economics

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Energy Technology 100%
Responsible persons	Minna Loikkanen, Administrative person Tapio Ranta, Responsible teacher Raghu KC, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: Upon completion of the course the students will be able to utilise energy economic calculation methods and to calculate the additional cost in the energy production costs caused by emission trading. Students will be able to describe the basic concepts of Finnish energy economics and explain the structure of energy taxation in Finland, and calculate the energy taxes of fuels. Students will understand the structure of energy tariffs, and will be able to compile a duration curve of the consumption curve of energy.

Content

EN: Use of energy statistics. The variation in energy demand and duration curves. Calculation methods for energy production costs. Profitability calculations of energy projects. Environmental impacts in energy production, especially carbon dioxide emissions. Energy and fuel markets. The effect of emission trading on the price of electricity, and energy tariffs. Energy taxation and the pricing system of natural gas. Energy economics in Finland and EU. The need for investments in electricity production. National energy and climate strategy. Fuel economics. Energy scenarios.

Study materials

EN: Material on Moodle.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	5 cr
Course Registration		0 cr
Course Assessment		5 cr

BH70A0101 Advanced Modelling Tools for Transport Phenomena

BH70A0101 Advanced Modelling Tools for Transport Phenomena

Curriculum period	2025-2026
Validity period	1 Aug 2025-31 Jul 2026
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Energy Technology 100%
Responsible persons	Minna Loikkanen, Administrative person Payman Jalali, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Basic knowledge on programming using MATLAB or any other language. Basic Fluid Mechanics and Heat Transfer courses passed.

Learning outcomes

EN: Transport phenomena are dealing with the heat, mass and momentum transfer in engineering and science. In this course, advanced modeling tools and methods are introduced for students of energy technology and other departments with related background in heat transfer and fluid dynamics. Students will learn how the related computer packages such as FLUENT, COMSOL Multiphysics and MATLAB can be used to solve and analyze heat transfer and fluid flow problems using computational fluid dynamics (CFD). This course provides a mathematical basis for problem formulation, and coding/solving using the above-mentioned computational packages. Students will learn how to solve simple transport problems using their own codes in MATLAB. Then more complex problems will be taught to solve using COMSOL and FLUENT packages. Upon completion of this course, they will be able to start working on various topics in heat and fluid flow engineering for advanced designs or analysis.

Content

EN: Introduction to ‘transport phenomena' and related problems, feeding problems into CFD algorithms and methods (discretization of equations and domains, transforming differential equations into algebraic equations etc.), diffusion and convection equations solved by finite
difference and finite volume methods, complexities due to property variation, geometry and boundary conditions, application of computational packages (such as MATLAB, FLUENT, COMSOL Multiphysics etc.) in solving transport phenomena problems.

Additional information

EN: Note
LEnrollment is done in Sisu. For late registrations, teacher may be contacted first if no official registration is possible. Suitable for doctoral studies.

Study materials

EN: J.D. Anderson: Computational Fluid Dynamics, McGraw-Hill, Inc. 1995. D.A. Anderson, J.C. Tannehill, R.H. Pletcher: Computational Fluid Mechanics and HeatTransfer, McGraw-Hill, Inc. 1984. J.H. Ferziger, M. Peric:

Computational Methods for Fluid Dynamics, Springer-Verlag 1996. C. Hirsch: Numerical Computation of Internal and External Flows, Volume 1: Fundamentals of Numerical Discretization, John Wiley ; Sons, 1988. MATLAB user manual. FLUENT user manual. COMSOL Multiphysics manual. Moodle.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	5 cr
Course Completion		5 cr

BH60A2102 Advanced Course in Life Cycle Assessment

BH60A2102 Advanced Course in Life Cycle Assessment

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	8 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Environmental Technology 100%
Responsible persons	Risto Soukka, Responsible teacher Annukka Ilves, Administrative person Sanni Väisänen, Responsible teacher Olli Helppi, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Recommended: BH60A6000 Basic Course in Life Cycle Assessment or other course considering life cycle assessment, and BH60A0252 Solid Waste Management Technology or other course considering large technical systems with material flows and BH20A0750 Teknillinen termodynamiikka/BH20A0720 Engineering Thermodynamics or other course including the fundamentals of engineering thermodynamics.

Learning outcomes

EN: Upon completing the course, students are expected to be able to:
1. Explain the fundamental concepts of the LCA.
2. Design, implement and analyze LCA studies to select products and services that meet sustainable development requirements.
3. Design, implement, and analyze LCA study to identify development needs for products and services.
4. Identify the most cost-effective methods to reduce environmental impact.
5. Perform life cycle assessments using specialized software.
6. Apply theories to discover and develop the most sustainable designs for product, processes or systems.

Content

EN: IIntroduction to life cycle assessment (LCA), carrying out life cycle assessment, aspects related to inventory analysis, aspects related to impact assessment, calculating a carbon footprint, introduction to organizational LCA, introduction to life cycle costing, aspects related to life cycle costing, LCA, S-LCA and LCC examples. This course is also suitable for postgraduate students.

Study materials

EN: Walter Klöpffer, Birgit Grahl Life Cycle Assessment (LCA), A Guide to Best Practice. Standards ISO 14040 and ISO 14044.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	8 cr
Course Completion		8 cr

BH60A6400 Energy Efficient Environment 2

BH60A6400 Energy Efficient Environment 2

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Environmental Technology 100%
Responsible persons	Mika Luoranen, Responsible teacher Annukka Ilves, Administrative person
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: BH60Ax Energy Efficient Environment 1

Equivalences to other studies

BH60A2701 Energy Efficient Environment

Learning outcomes

EN: Upon completion of the course the student is expected to be able to:
1. assess energy related factors that affect areal planning,
2. compare factors that affect the sustainability of energy solutions for individual buildings and areas, and
3. plan and execute a procedure for comparing relevant energy aspects of competing energy supply alternatives for a housing area.

Content

EN: The tutorial lectures include introduction to calculation methods supporting the assignment. Students will complete an assignment concerning the selection of a sustainable energy supply and distribution system for area.

Study materials

EN: Tutorials, assignment material, Moodle.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	3 cr
Course Completion		3 cr

CS30A0940 Intelligent product-service systems

CS30A0940 Intelligent product-service systems

Curriculum period	2025-2026

Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Industrial Engineering and Management 100%
Responsible persons	Armi Rissanen, Administrative person Lea Hannola, Responsible teacher Ilkka Donoghue, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: B.Sc. on Industrial Engineering and Management, or equivalent knowledge.

Equivalences to other studies

CS35A0153 Product Lifecycle Management

Learning outcomes

EN: Student can
1. understand trends of product-service systems and digital transformation affecting manufacturing business

2. define and explain the concepts related to product data management and sustainable product life cycle management (PLM)
3. recognize the company's product and service processes and understands their interaction with the company's overall operations
4. compare business information management systems' characteristics, technical features and managerial functions and see their role in product development and business management

Content

EN:
Product-Service Systems (PSS) and Product Lifecycle Management (PLM) trends and digital transformation. Different views on a product/service: structures – processes – lifecycles – sustainability - data/information, challenges with lifecycle management, requirements management and systems engineering. IoT and digital platform based data services for sustainability, features and functionalities of PSS/PLM systems. PLM projects and demos of systems utilization. Future of PSS in various industries.

Additional information

EN: This course is aimed for the students of Master's Degree level.
The course is eligable in doctoral studies. (Jatko-opinto kelpoinen)

The course is related to UN's Sustainable Development Goals (SDG): 8 decent work and economic growth and 9 industry, innovation and infrastructure

Study materials

EN: Journal articles and lecture material. Sääksvuori-Immonen: Product Lifecycle Management, Springer 2008.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period	6 cr

Course Completion 6 cr

CS30A1570 Complex Systems

CS30A1570 Complex Systems

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Industrial Engineering and Management 100%
Responsible persons	Armi Rissanen, Administrative person Leonid Chechurin, Responsible teacher Viktor Dodonov, Responsible teacher Elizaveta Girshova, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Basic programming skills. Familiarity with the basics of system modelling is welcome

Recommended prerequisites

CS30A0810 Must-Have Math for Decision Makers

CS30A1630 System modelling

Learning outcomes

EN: After completing the course, students will be able to:

- describe complexity, know basic phenomena of complex systems
- understand principles of complex systems
- use simulation to model complex systems
- investigate the evolution of complex models
- use NetLogo software for agent-based modelling

Content

EN: We learn the language that scientists use to understand complexity in systems. Students design their own chaos, fractals, various types of popular optimization algorithms like ant or genetic algorithms, simulate behavior of complex communities, participate in interactive prisoner dilemma game and more. We witness the birth of complexity in every topic: how extremely simple rules of interaction between elements can result in intelligent behavior of the whole system.
Topics:

- Theory of complexity
- System dynamics and chaos
- Fractals
- Information theory
- Genetic algorithms
- Cellular automata
- Models of biological self-organization

- Models of Cooperation in Social Systems

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG): 4 quality education, 7 affortable and clean energy, 8 decent work and economic growth, 9 industry, innovation and infrastucture

Study materials

EN: Course materials are given in Moodle together with lectures, quizzes, assignments, additional materials. The course uses teaching materials of Santa Fe Institute (USA) licensed for LUT use.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 4. period, 3. period	6 cr
Course Completion		6 cr

CS30A1620 Artificial Inventiveness

CS30A1620 Artificial Inventiveness

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	1 cr
Languages	English
Grading scale	Pass-Fail
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Industrial Engineering and Management 100%
Responsible persons	Leonid Chechurin, Responsible teacher Armi Rissanen, Administrative person Zahra Honarmand Shahzileh, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Equivalences to other studies

CS30A1641 Inventive Product Design and Advanced TRIZ

or

CS30A7390SS Inventive Product Design and Advanced TRIZ

or

CS30A7380SS Systematic Creativity - TRIZ Basics

or

CS30A7381SS Systematic Creativity - TRIZ Basics Online

or

CS30A7391SS Inventive Product Design and Advanced TRIZ Online

Learning outcomes

EN: Upon successful completion of the course the learner is expected to be able to:

- Identify inventive problems in the complex process of product development

- Apply several tools for systematic idea generation (Function modelling, Ideal final result, Function-oriented search, Contradictions analysis)
- Act step-by-step when creative and out-of-box ideas are needed

Content

EN: It is an online course for all interested in creativity, in systematic tools of ideation. The modules contain basic TRIZ (Theory for Inventive Problem Solving) tools for idea generation.
Have you ever thought why it is hard to find a new idea sometimes? How to analyze the situation where you need an out of box solution? How to deliver systematically the list of concepts to improve a product or a service?

This self-paced course includes the following modules:

1. Introduction
2. Function Definition
3. Ideal Final Result
4. Function-oriented Search
5. Contradictions

This course is a brief introduction to creativity and idea generation with elements of theory, everyday life examples and tests for self-check. If you want to dive deeper into TRIZ and tools for idea generation, we would be happy to invite you to instructor-paced Inventive Product Design and Advanced TRIZ course.

Study materials

EN: Course videos are available here .

Remember to submit your certificate in Moodle!

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 1. period-SummerSummer	1 cr
Course Completion		1 cr

CS30A1641 Inventive Product Design and Advanced TRIZ

CS30A1641 Inventive Product Design and Advanced TRIZ

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Industrial Engineering and Management 100%
Responsible persons	Armi Rissanen, Administrative person Leonid Chechurin, Responsible teacher Katriin Vannik, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: The aim of the course is to introduce the students to the wide range of existing design methods with a focus on design creativity and innovation. The participants will gain both theoretical competences and practical skills, from the descriptive models for analyzing design processes and behaviors, to the prescriptive tools that provide a structured and multi-disciplinary approach to design.
Upon successful completion of the course the learner is expected to be able to:

- Distinguish conceptual design phase and instruments of it
- Analyze patent landscape
- Use ideation algorithms
- Design a new product and concept of the service on demand
- Evaluate design concepts from managerial and production perspectives

Content

EN: It is a course for all interested in creativity, in systematic tools of ideation. The modules contain basics of TRIZ (Theory for Inventive Problem Solving) and other tools for idea generation and other analytical tools that have proven their efficiency in the industry. Half of the course is devoted to the work on challenges given from real companies.
Main course's modules (x means variable part):

- Introduction
- Basics of patenting
- Function definition
- Ideal final result
- Function-oriented search and biomimetics
- Contradictions
- Function modelling and trimming
- Cause-effect chain analysis (x)
- Trends of engineering system evolution (x)
- Axiomatic design (x)
- Design for manufacturing and assembly (x)
- Conclusion

There are about 20 case studies and 100+ examples of smart new product design, technology troubleshooting and inventive solutions, many of which are coming from success and failure stories of technological giants.

Study materials

EN: Course is heavily supported by study materials in video and textual form. They are all in Moodle, the access is provided during the course.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 4. period, 3. period	6 cr
Course Completion		6 cr

CS30A1671 Service Innovation and Management

CS30A1671 Service Innovation and Management

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Industrial Engineering and Management 100%
Responsible persons	Ville Ojanen, Responsible teacher Armi Rissanen, Administrative person Kalle Elfvengren, Responsible teacher Yan Xin, Responsible teacher

Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Recommended: B.Sc. on Industrial Engineering and Management, or equivalent knowledge

Learning outcomes

EN: Student can
1. recognize and categorize the variety of services and service firms in modern industrial environment as well as understand their influence in management of industrial innovations
2. identify the characteristics of services and evaluate the similarities, differences and links between services and physical products
3. define the dimensions of service innovations
4. explain the processes of new service development
5. identify the main managerial challenges in service innovation management
6. select and apply the suitable frameworks, tools and methods, to overcome some typical real-world challenges in service innovation management

Content

EN: Typologies of service firms. Characteristics of services. Product-service systems and Servitization. Knowledge-intensive business services. New service development process. Dimensions of service innovations. Productization of services. Supporting methods for service innovation management. Service quality and its improvement. Managerial challenges in service innovation management. Utilization of frameworks, methods and tools in service innovation management. Roles of different types of firms in service systems and networks. Value creation through services. Customer-centric service development. Service business innovation global megatrends. Service marketing strategies.

Additional information

EN: ***
The course is related to UN's Sustainable Development Goals (SDG): 4 quality education, 8 decent work and economic growth, 9 industry, innovation and infrastructure

Study materials

EN: Lecture notes. Other material, books and articles announced in the beginning of the course. Recommended reading: Wirtz, J. & Lovelock, C. (2022), Services Marketing: People, Technology, Strategy, 9th ed. World Scientific.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr

CS31A0720 Basics of ERP systems

CS31A0720 Basics of ERP systems

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Industrial Engineering and Management 100%

Responsible persons	Armi Rissanen, Administrative person Lasse Metso, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: After completing the course students will be able to:

- evaluate the benefits of ERP system
- develop and modify master data to ERP system
- support business processes by use of ERP system

Content

EN: Theory of ERP systems and security of ERP systems.
SAP business processes:

Logistics

- Purchasing
- Inventory Management
- Warehouse Management
- Production Contro
- Sales and Distribution
- Plant maintenance
- Project Management

Accounting

- Financial Accounting
- Controlling

Human Capital Management

Additional information

EN:
***

The course is related to UN's Sustainable Development Goals (SDG):

8 decent work and economic growth, 9 industry, innovation and infrastucture

Study materials

EN: Materials used in this course are mainly based on SAP UCC material which are given to students and scientific articles (defined during course).

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr

CS30A1365 Sustainability-oriented innovation

CS30A1365 Sustainability-oriented innovation

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Industrial Engineering and Management 100%
Responsible persons	Nina Tura, Responsible teacher Armi Rissanen, Administrative person
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Students should have accomplished: Innovaatio- ja teknologiajohtamisen peruskurssi (Basics in innovation and technology management) or equivalent.

Recommended prerequisites

CS30A0952 Innovation and Technology Management: a Basic Course

Learning outcomes

EN: The course aims to familiarize students with the concept of sustainability-oriented innovation and its applications to innovation management.
Aims:
After completion of the course, students will be able to:
1) Understand and explain the key concepts and theoretical principles related to sustainability and innovation.
2) To be able to examine the different types of sustainability-oriented innovations and companies executing such innovations.
3) Recognize and understand the characteristics of new emerging concepts, markets and business models (such as circular economy) having potential for sustainable value creation.
4) Critically examine sustainable value creation including possibilities for negative value creation (e.g. tensions and trade-offs)
5) To be able to critically analyze organizations' development and management requirements related to sustainability-oriented innovation.
6) To understand an apply practically learned principles and concepts in relation to innovation management practices and innovation processes.

Content

EN: The idea of the course is to learn and understand the links between innovation management and sustainability and familiarize students with the emerging concepts of sustainability-oriented innovation. The course aims to enhance the development of students' sustainability competences (e.g. critical and anticipatory thinking, collaboration, communication, strategic action and systems thinking) to be used in future decision-making.

Additional information

EN: Course utilizes Moodle-platform.
***
The course is related to UN's Sustainable Development Goals (SDG): 8 decent work and economic growth, 9 industry, innovation and infrastructure, sustainable cities and communities, 12 responsible consumption and production, 13 climate action, 17 partnership for the goals

Study materials

EN: Recent academic literature and online lectures.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period	3 cr
Course Completion		3 cr
Method 2	Recurrence 1: 3. period	3 cr
Course Completion		3 cr

CS30A0810 Must-Have Math for Decision Makers

CS30A0810 Must-Have Math for Decision Makers

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	Pass-Fail
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Industrial Engineering and Management 100%
Responsible persons	Armi Rissanen, Administrative person Leonid Chechurin, Responsible teacher Viktor Dodonov, Responsible teacher Anna Kruzenshtern, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: After completing the course, students will be able to:

- perform basic operations over mathematical objects and operators: matrix, polynomial, derivative, integral, equation/inequation, differential equations, mean/variance, regression, etc.
- know basic optimization strategies
- code/operate the above mentioned in MATLAB and/or Python

Content

EN: Basics of linear algebra, probability theory, differential equations and optimization, programming in MATLAB-Simulink and Python

Study materials

EN: Course materials are given in Moodle together with lectures, quizzes, assignments, additional materials.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 1. period-4. period	3 cr
Course Completion		3 cr

CS34A0780 Start-ups and venture formation

CS34A0780 Start-ups and venture formation

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Industrial Engineering and Management 100%
Responsible persons	Armi Rissanen, Administrative person Noora Heino, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Tweet text

EN: The course focuses on start-ups, spin-offs and the planning of new ventures. On-line course.

Equivalences to other studies

CS34A0735 New Venture Creation

Learning outcomes

EN: After the course the student is familiar with business start-up theories and processes, is able to critically analyze different business ventures and is skilled in testing business ideas and models. In addition, the student is able to analyze business cases and prepare a business plan as well as pitch the plan successfully.

Content

EN: Entrepreneurship theory and process, business ideas and opportunities, business models, entrepreneurial teams, start-ups and spin-offs, start-up process and development stages, start-up strategies and sequencing activities, start-up financing, testing of business ideas, business plans, cases.

Additional information

EN: On-line course.
Max. 40 participants. Priority is given to the students of ENTER programme.

Entrepreneurship Minor students:

In case that the course will not be organized due to too low number of participants, students who are completing an entrepreneurship minor may opt for one of the following courses:

- CS30A1665 Strategic entrepreneurship in the age of uncertainty
- CS30A1342 Technology and Innovation Management, project course

Study materials

EN: Barringer, B.R. & Ireland, R.D. (2006 or later edition). Entrepreneurship: successfully launching new ventures. Pearson Prentice Hall.
Other materials distributed during the course.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr

CS34A0060 Academic entrepreneurship

CS34A0060 Academic entrepreneurship

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Industrial Engineering and Management 100%
Responsible persons	Armi Rissanen, Administrative person Tuuli Ikäheimonen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: The aim of the course is to enhance students' understanding of entrepreneurship, including its opportunities and requirements. It introduces students to the entrepreneurial mindset, key traits of entrepreneurs, and the resources needed to succeed in entrepreneurship. Throughout the course, participants will explore how to identify entrepreneurial opportunities and reflect on their own (academic) skills, knowledge, and expertise from an entrepreneurial perspective. The course will also touch upon the role of entrepreneurial teams, highlighting how collaboration and diverse skill sets contribute to successful entrepreneurial ventures. Finally, the course will provide insights into effectively communicating one's skills, expertise, and business ideas.

Content

EN:

- The central concepts of entrepreneurship
- The entrepreneurial mindset, motivation and resources
- Opportunity recognition
- Basic idea of the venturing process
- Entrepreneurial teams
- Commercializing academic skills and research activities and/or communicating entrepreneurial ventures

Additional information

EN: The course is suitable for those students interested in entrepreneurship and developing their entrepreneurial competences, and enhancing their ability to communicate their skills and competences either as an entrepreneur or an employee.
*****

The course relates to United Nations Sustainable development Goal (SDG): 8 Decent work and economic growth.

Study materials

EN: Bridge, S., O'Neill, K. & Cromie, S. (2003) Understanding enterprise, entrepreneurship and small business. Palgrave MacMillan.
Other literature to be announced in the course.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period	6 cr

Course Completion 6 cr

CS30A1630 System modelling

CS30A1630 System modelling

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Industrial Engineering and Management 100%
Responsible persons	Armi Rissanen, Administrative person Leonid Chechurin, Responsible teacher Viktor Dodonov, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Knowledge of engineering mathematics at the bachelor's level will be sufficient

Recommended prerequisites

CS30A0810 Must-Have Math for Decision Makers

Learning outcomes

EN: After completing the course, students will be able to:

- understand what dynamic systems and mathematical models are
- understand the difference between deterministic, stochastic, chaotic
- analyze system stability and check it numerically
- apply basic system control and evaluate its quality
- choose basic models for simulation of complex systems
- predict system’s behavior based on model simulation
- use Simulink software for system modelling

Content

EN: Economic/financial/demographic and other systems are supposed to be used as the study objects. First, we learn how to model the dynamical behaviour of scalar systems, linear and nonlinear, by the differential equations. Then we extend the analysis by multivariable dynamic systems. We learn how to describe system behaviour, how to predict and how to optimise it.
All the theory is given the numerical examples and simulations.

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG): 4 quality education, 7 affortable and clean energy, 8 decent work and economic growth, 9 industry, innovation and infrastucture

Study materials

EN: Course materials are given in Moodle together with lectures, quizzes, assignments, additional materials.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr
Method 2	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr

BK70A0102 Simulation, Laboratory Course

BK70A0102 Simulation, Laboratory Course

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Mechanical Engineering 100%
Responsible persons	Annukka Ilves, Administrative person Aki Mikkola, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Recommended: BK70A0001 Simulation of a Mechatronic Machine completed.

Learning outcomes

EN: The student will learn the advanced theories and practices of the mathematical modelling and computer simulation of machine systems. The student will be able to utilise advanced simulations to solve a practical design assignment. The student will be able to verify and evaluate the accuracy of simulation models. The student will be able to conduct individual scientific work to analyse the dynamics of machine systems.

Content

EN: Spatial kinematics, modelling of flexible bodies in multibody applications, modal reduction methods, real-time simulation, embedded systems, contact modelling, multibody dynamics on failure analysis, vehicle modelling, model verifications, practical measurements.
The course module supports the following UN Sustainable Development Goals: #9 Industry, Innovation and Infrastructure.

Study materials

EN: Lecture notes. Shabana, A. A.: Dynamics of Multibody Systems, Cambridge University Press, 3rd edition, 2005. ISBN 0-521-85011-8.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	5 cr
Course Completion		5 cr
Method 2	Recurrence 1: 3. period-4. period	5 cr
Course Completion		5 cr

BK70A0501 Machine Dynamics

BK70A0501 Machine Dynamics

Abbreviation: BK00CE19

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Mechanical Engineering 100%
Responsible persons	Annukka Ilves, Administrative person Jussi Sopanen, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Students are recommended to have basic skills on Dynamics. Experience or basic studies of Finite Element Method (FEM) is also recommend, but not required.

Equivalences to other studies

BK10A3201 Machine Dynamics JEDI

Learning outcomes

EN: The student will learn theories and practices of structural dynamics and knows how to apply the knowledge in the design of machine systems. He/she is able to model dynamic machine systems, solve the equations of motion in frequency and time domains and analyze the results from simulations and measurements. The student knows the basics of vibrations measurements and experimental modal analysis. The student is able to review and interpret his/her student mate's simulation results resembling the tasks in the later career. Some of the practical examples and assignments are real-life cases arising from co-operation with industrial companies.

Content

EN: Multiple degree-of-freedom vibrations, solution and interpretation of natural frequencies and modes. Response to the harmonic and general force excitation. Derivation of the equations of motion of the system and solution in the frequency and time domain. Vibration measurements and experimental modal analysis. Introduction to rotor dynamics. Torsional vibrations.

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG): 7 affordable and clean energy, 9 industry, innovation and infrastructure

Study materials

EN: Lecture notes.

Literature

Inman, D. J.: Engineering vibration, 3rd ed., Pearson Education Inc., New Jersey, 2007. ISBN 0-13-228173-2.

Thomson, W. T. & Dahlen M.D., Theory of Vibration with Applications, 5th edition, 1998

Friswell M, Penny J, Garvey S et al. Dynamics of Rotating Machines. New York: Cambridge University Press; 2010

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	5 cr
Course Completion		5 cr
Method 2	Recurrence 1: 3. period-4. period	5 cr
Course Completion		5 cr

BK20A3100 Welding and Laser Processing of Metals

BK20A3100 Welding and Laser Processing of Metals

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Mechanical Engineering 100%
Responsible persons	Annukka Ilves, Administrative person Shahriar Afkhami, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Basic understanding of welding processes and materials sciences.BK10A3500 Materiaalitekniikka / BK10A5900 Materials

Equivalences to other studies

BK20A2400 Materials and Welding Metallurgy

Learning outcomes

EN: The aim of the course is to familiarize the student with the welding metallurgy and weldability of metal materials as well as different laser processing methods and applications on metals. After having completed and passed this course, the student will be able to:

- identify the composition and classification of metal materials,
- explain the physical characteristics and mechanical properties of metals,
- demonstrate heat effects and treatments on metals,
- identify fundamental principles and practices of welding metallurgy,
- predict and analyze macrographs and microstructures of metal samples and welded joints,
- apply the knowledge of material behavior in welding for different applications in practice,
- understand the basic concepts of weldability tests,
- compare laser materials processing processes and knows special features of different processes,
- identify what are the theoretical basis affecting in different laser processes and how they affect the possible applications based on them,
- understand how laser processing parameters affect the quality of the process / part.

Content

EN: The course comprises lectures and laboratory exercises, of which themes are:

- Basic metallurgical principles of both metal materials and welding of them
- Principles of heat treatments / effects and metallographic examination procedures on metals

- Different metallurgical analyzing procedures in practice
- Weldability tests
- Laser beam material interaction, transmission, reflection and absorption
- Effect of laser-based heating, melting, vaporization and ablation on material
- Formation of keyhole and related phenomena
- Most common laser processes, such as laser welding, laser-hybrid welding, cutting, marking, drilling, engraving, laser-based additive manufacturing and surface treatment
- Combined theoretical and practical cases and applications

Additional information

EN: The course is related to UN Sustainable Development Goals (SDGs): 4 Quality education, 9 Industry, innovation and infrastructure, 12 Responsible consumption and production, 13 Climate action.

Study materials

EN:

- Lectures and course material in Moodle.
- Welding: Principles and Applications, L. Jeffus, Cengage.
- Welding Metallurgy, S. Kou, John Wiley & Sons.
- Introduction to the Physical Metallurgy of Welding, K. Easterling, Butterworth-Heinemann.
- Modern Welding Technology, H. B. Cary, S. C. Helzer, Pearson.
- Welding Metallurgy and Weldability, J. C. Lippold, John Wiley & Sons.
- Applied Welding Engineering: Processes Codes and Standards, R. Singh, Elsevier.
- Laser Material Processing, W. Steen, J. Mazumder, Springer.
- Laser Processing of Engineering Materials, J. Ion, Elsevier.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	5 cr
Course completion		5 cr
Method 2	Recurrence 1: 3. period-4. period	5 cr
Course completion		5 cr

BK30A1600 Laser and Additive Manufacturing Systems

BK30A1600 Laser and Additive Manufacturing Systems

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Mechanical Engineering 100%
Responsible persons	Ilkka Poutiainen, Responsible teacher Annukka Ilves, Administrative person Marika Hirvimäki, Responsible teacher Sami Westman, Responsible teacher Vesa Tepponen, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Equivalences to other studies

BK30A0803 Digital Advanced Manufacturing with Lasers

or

BK30A0902 Additive Manufacturing and 3D Printing (Basics)

Learning outcomes

EN: After having passed the course, the student will:
- understand how laser beams are generated in a laser resonator and what kind of optical arrangements are required for a laser materials processing system
- understand the risks, hazards, and regulations involved in laser materials processing and procedures and how these risks are handled in practice
- understand the practical aspects of laser material processing of different materials
- have an understanding on laser based additive manufacturing systems and their special features
- have an understanding of possible manufacturing solutions for the advanced energy sector industry in the future

Content

EN: Knowledge on different laser and additive manufacturing (AM) equipment. In laser based systems resonator types, accessories and processing systems and requirements of different ways to process material with a laser beam are presented. Optical components used for laser processing, safety, and quality assurance. Tools for beam forming, guiding, and modification. The principles of systems used for additive manufacturing are introduced focused mainly on laser based processes. Participation in laser processing and AM demonstrations.

Additional information

EN: Blended learning

Study materials

EN: Lecture material in Moodle. Further reading e.g. Steen, W., Laser Material Processing.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	5 cr
Course completion		5 cr
Method 2	Recurrence 1: 3. period-4. period	5 cr
Course completion		5 cr

BK20A3000 Welding Automation

BK20A3000 Welding Automation

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Mechanical Engineering 100%
Responsible persons	Sakari Penttilä, Responsible teacher Annukka Ilves, Administrative person
Study level	Advanced studies

Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Basic knowledge is required from the welding processes and manufacturing. BK10A3601 Valmistus- ja tuotantotekniikka or BK10A7400, Production Engineering 1 (or similar knowledge) is recommended to be passed before attending the course.

Equivalences to other studies

BK20A2700 Welding Digitalisation, Automation and Adaptivity

or

BK20A2600 Modelling and Simulation in Welding

Learning outcomes

EN: The aim of the course is to widen the knowledge about the various aspects of industrial welding digitalization, automation and adaptivity. Further, welding robotization and offline programming are the main focus of the course. After having completed and passed this course, the student:
· has a knowledge about the welding automation processes and their variations that are used in industry,

· can compare and evaluate different welding processes and automation levels from productivity, usability and profitability point of view

· can choose the most suitable welding process and automation level for manufacturing different types of products,

· understands the relationship between the welding process, automation, adaptivity and quality

· has a general overview of utilizing welding automation methods relative to welding production and quality management

· knows the different sensor techniques, data analysis methods and virtual/digitalized tools used in welding

· will be able to use offline robot simulation software to model a robot welding station, simulate its operation and make programs for the welding robot cells

Content

EN: The course comprises lectures, simulation exercises and laboratory exercises to make the student familiar with welding automation, processes and practices related to the welding automation field. Course themes are listed below:
· The concept of weldability in terms of automation and adaptivity.

· Automation levels of welding (manual / mechanized / robotized).

· Essential parameters, productivity, usability, and efficiency of mechanized and robotized welding processes.

· Robot Programming methods

· Multi-robot stations

· Welding robot off-line programming

· Welding preparations (e.g. groove cutting and beveling methods) and post-weld treatments as an automated welding production point of view.

· Sensor technologies and jig systems used in welding.

· Adaptive welding

· Possibilities of Virtual Reality, Augmented Reality and Mixed reality in welding production

The simulation exercises consists of basic operations of the welding robot off-line programming. Laboratory exercises consists of welding robot manipulation, welding operations as well as seam finding and tracking possibilities. The final exam consist of questions related to all the lecture material and laboratory exercise contents.

Additional information

EN: The course is related to UN Sustainable Development Goals (SDGs): 4 Quality education, 9 Industry, innovation and infrastructure, 12 Responsible consumption and production, 13 Climate action.

Study materials

EN: · Lectures in Moodle(Echo360) and face-to-face lectures (will be recorded also).
· Teollisuuden robotiikka / The Industrial robot book, Suomen Robotiikkayhdistys Ry

· Modern Welding Technology, H. B. Cary, S. C. Helzer, Pearson.

· Modeling, Sensing and Control of Gas Metal Arc Welding, D. S. Naidu, S. Ozcelik, K. L. Moore, Elsevier.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	5 cr
Course completion		5 cr

FY30A0300 Solid State Detectors and Their Applications

FY30A0300 Solid State Detectors and Their Applications

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Physics 100%
Responsible persons	Panja Luukka, Responsible teacher Jonna Naukkarinen, Administrative person
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Tweet text

EN: This course provides a balanced approach between theoretical knowledge and practical application.

Recommended prerequisites

FY30A0200 Physics of Semiconductor Devices

Learning outcomes

EN: By the end of this course, students will be able to:
1. Understand the historical development and evolution of Solid State Detectors (SSD).
2. Grasp the fundamental physics and principles governing SSD operation.
3. Analyze the design considerations and trade-offs in SSD technology.
4. Consider the many potential uses in various domains.
5. Learn about advanced topics and future directions in SSD research.

Content

EN: The theory, design, and applications of Solid State Detectors (SSDs), which are essential in many scientific and engineering fields, are examined in this advanced master's-level course. The course includes both theoretical principles and real-world applications.

Additional information

EN: Other additional information
***

The course is related to UN's Sustainable Development Goals (SDG): 3 good health and well-being, 4 quality education, 7 affordable and clean energy, 9 industry, innovation and infrastructure, 11 sustainable cities and communities

Literature

G.F. Knoll - Radiation Detection and Measurement

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period	3 cr
Course Completion		3 cr

FY30A0400 Microelectronics and Readout Electronics for Experimental Physics

FY30A0400 Microelectronics and Readout Electronics for Experimental Physics

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Physics 100%
Responsible persons	Panja Luukka, Responsible teacher Jonna Naukkarinen, Administrative person
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Tweet text

EN: This course gives students the skills needed to solve problems in microelectronics and readout electronics used in experimental physics.

Recommended prerequisites

FY30A0200 Physics of Semiconductor Devices

Learning outcomes

EN: By the end of this course, students will be able to:
1. Understand the principles of microelectronics design and fabrication
2. Understand the principles of detector operation and signal processing
3. Recognize the role of modern technologies in experimental physics
4. Design and analyze readout circuits for various applications
5. Use circuit simulation tools to model electronic behaviour
6. Gain hands-on experience on detector read-out system in collaborating project

Content

EN: The goal of this advanced course is to give Master's students with a background in physics or a similar discipline a basic understanding of readout electronics and microelectronics, as well as their crucial significance in contemporary experimental physics. Students who complete the course will have the basic theoretical understanding and practical abilities needed to develop, estimate, and troubleshoot electronic systems that are used to measure and detect physical signals.

Additional information

EN: Other additional information
***

The course is related to UN's Sustainable Development Goals (SDG): 3 good health and well-being, 4 quality education, 7 affordable and clean energy, 9 industry, innovation and infrastructure, 11 sustainable cities and communities

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period	3 cr
Course Completion		3 cr

FY30A0500 Reliability of Detectors and Microelectronics

FY30A0500 Reliability of Detectors and Microelectronics

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	4 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Physics 100%
Responsible persons	Panja Luukka, Responsible teacher Jonna Naukkarinen, Administrative person
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Tweet text

EN: This course provides an overview of reliability aspects in detectors and microelectronics including radiation effects.

Prerequisites

EN: The course is designed for advanced undergraduate or master's students who already have a solid understanding of electronics and want to delve deeper into specialised areas such as reliability engineering.

Recommended prerequisites

FY30A0200 Physics of Semiconductor Devices

FY30A0300 Solid State Detectors and Their Applications

FY30A0400 Microelectronics and Readout Electronics for Experimental Physics

Learning outcomes

EN: By the end of this course, students will be able to:
1. Comprehend fundamental concepts of reliability engineering.

2. Evaluate detector performance under various conditions.
3. Understand the design requirements for robust microelectronic circuits considering reliability aspects.
4. Learn the fundamentals of testing to guarantee the component quality and longevity.

Content

EN: This master's-level course is intended to provide an overview of reliability aspects in detectors and microelectronics including radiation effects, addressing both theoretical foundations and practical implementations.

Additional information

EN: Other additional information
***

The course is related to UN's Sustainable Development Goals (SDG): 3 good health and well-being, 4 quality education, 7 affordable and clean energy, 9 industry, innovation and infrastructure, 11 sustainable cities and communities

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 4. period	4 cr
Course Completion		4 cr

FY30A1100 From Pulse Shapes to Physics: Data Analysis in Particle Physics

FY30A1100 From Pulse Shapes to Physics: Data Analysis in Particle Physics

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Physics 100%
Responsible persons	Jonna Naukkarinen, Administrative person Henning Kirschenmann, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Recommended:
Introduction to particle physics, special relativity, quantum mechanics. Basic proficiency in Python or a similar programming language. Courses in statistics, computational physics, and experimental methods in physics

Learning outcomes

EN: By the end of this course, students will be able to:

1. Explain and Outline: *Describe the full pipeline by which raw signals from particle detectors are transformed into validated physics measurements.*

2. Implement Data Processing Workflows: *Apply noise reduction, calibration, and signal extraction methods to prepare detector outputs for physics analysis.*

3. Reconstruct and Identify Particles: *Use computational tools and detector signatures to reconstruct particle trajectories, calculate kinematic quantities, and identify decay products.*

4. Employ Statistical Methods: *Conduct hypothesis testing, uncertainty quantification, and data fitting techniques within a high-energy physics context.*

5. *Communicate Results Effectively:* *Produce clear, well-structured scientific reports and presentations, showcasing reproducible research practices and data-driven conclusions.*

Content

EN: This course offers a hands-on exploration of how modern particle physics experiments convert raw detector signals into quantitative physics results that push our understanding of the universe forward. By working directly with data—both simulated and real—from the CMS experiment at the CERN Large Hadron Collider (LHC), students will follow the entire analysis pipeline: from interpreting raw pulse shapes to reconstructing particle trajectories and performing high-level statistical tests. Participants will learn key techniques of signal processing, data calibration, and event reconstruction, developing critical computational and statistical skills that enable them to extract meaningful physics insights from complex datasets. Focusing on practical workflows, this course equips students to apply state-of-the-art analysis methods, culminating in final projects that mirror authentic research efforts in experimental particle physics. Graduates of the course will be prepared to tackle advanced topics in high-energy physics, data science, and other research-intensive fields that demand rigorous, data-driven approaches.

Course Content

1. Introduction to Experimental Particle Physics Data
- LHC experiment design and data acquisition
- Core detector technologies and their signals

3. Signal Processing and Calibration
- Noise filtering, baseline correction, and time calibration
- Energy calibration and validation with known resonances

5. Data Analysis Techniques
- Particle tracking, momentum reconstruction, and kinematic variables
- Calculating invariant masses and identifying decay products

7. Statistical Tools for Particle Physics
- Likelihood methods, data fitting, and uncertainty quantification
- Significance testing and background estimation

9. Working with CMS Data
- Accessing and manipulating real CMS datasets
- Event selection and categorization: leptons, jets, missing energy
- Hands-on case studies: reconstructing known particles (e.g., Z boson) and searching for new physics signatures

11. Advanced Topics (Optional)
- Machine learning approaches for particle identification and classification
- Trigger systems and real-time data filtering

13. Final Project
- Independent data analysis using CMS open data: from raw signals to final physics results
- Emphasis on clear documentation and robust statistical interpretations

Additional information

EN: ***
The course is related to UN's Sustainable Development Goals (SDG): 4 quality education, 9 industry, innovation and infrastructure, 12 responsible consumption and production

Study materials

EN: Course slides, Jupyter notebooks, and interactive lab instructions
Access to CMS open datasets and simulated LHC collision events

Video tutorials demonstrating data analysis workflows and detector technologies

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 4. period	5 cr
Course Completion		5 cr

CT10A7004 Sustainability and IT

CT10A7004 Sustainability and IT

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Software Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Jari Porras, Responsible teacher Sanaul Haque, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs)

Prerequisites

EN: Bachelor's thesis or degree completed.

Learning outcomes

EN: At the end of this course students will be able to:
1. Identify various sustainable development challenges in the surrounding society
2. Demonstrate the critical thinking and argumentation skills in the discussions of sustainable development challenges
3. Identify the possibilities of IT and especially software engineering in the sustainable development challenges
4. Apply IT and especially software engineering for sustainable development challenges

Content

EN: The course emphasizes the role and impact of IT field and especially software engineering in the sustainable development. The topic is covered through selected books and scientific articles. Students may be divided into small groups that will each study the topic.

Additional information

EN: The course will be arranged for fall, spring, and summer. Students may take this as online self-study throughout the year. The lecture-based approach is available for students only in the spring semester. It has mandatory sessions held on the Lappeenranta campus.

The course looks at the sustainability of IT from many different perspectives and considers many SDGs. The software sustainability book by Coral Calero et al. claims that software sustainability touches mainly SDG 7, 8, 9, 12, 13, and 17, but in reality, the software can impact every one of the SDGs and their targets.

Study materials

EN: Online self-study material is given in Moodle and is based or various articles. Lessons based approaches announce the material for each installation separately.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr
Method 2	Recurrence 1: 1. period-2. period Recurrence 2: Summer	6 cr
Course completion, self-study		6 cr

CT10A7070 Hackathons and ICC events

CT10A7070 Hackathons and ICC events

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	1-6 cr
Languages	English
Grading scale	Pass-Fail
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Software Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Ari Happonen, Responsible teacher Jari Porras, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs)

Prerequisites

EN: Bachelor's thesis or degree completed. Other prerequisites are specified in the detailed course instructions.

Learning outcomes

EN: The students learn to work with given software engineering related technologies, software development practices, solution development and technology debug knowledge, challenge solving strategies, novel industry approaches and frameworks etc. in teams and to innovate & brainstorm solutions under positive time pressure to full fill the given development challenges in predefined time window(s).

At the end of this course, students will be able to:
1. Identify and conceptualize a viable technological solution or architectural / process design for a given challenge
2. Demonstrate team-working skills
3. Demonstrate the knowledge and skills of the selected technologies and methods in the given problem domain
4. Demonstrate software engineering skills.
5. Appreciate the need for lifelong learning

Content

EN: Students are presented a project / course challenge or theme in the beginning of each Hackathon / intensive code camp and/or Innovative collaboration creation event and they develop solutions to the problem in the given time frame with the given technologies. After the presentation of the given course specific challenge, the students innovate possible solutions and start learning or using the selected technologies. The main part of the event is usually utilized to develop the solution and in some cases learning to use the selected technologies in a collaborative manner before the working solutions are presented in the closing seminar. An intensive event lasts typically anything from a highly intensive weekend or a week to extended two week time period. The technologies used in each event are decided case by case and can change year-

ly. The detailed implementation of each event is designed to support the degree programs goals, and the detailed course instructions are published in Moodle.

Additional information

EN: Note!
The course is an intense course lasting from one day to roughly a week, and the actual timing of each course is announced separately. This course can be included in one degree two times provided that the course contents differ from each other.

Completion Method(s)

Intensive course implementation. May include pre and/or post tasks. Total workload is specified in the detailed course instructions which are published by the responsible teacher by indicating the information source(s) in Moodle. The workload is event specific (can be from 27 to 162 h).

If student is interested to have study points from non LUT affiliated and/or organized Hackathon/Code Camp event, request for such interested has to be expressed by minimum of 2 weeks before the event in question, including the details of the event and how does it relate to study programme studies.

Commercially organized, non higher education unit affiliated hackathon/code camp events, are excluded to be evaluated for potential study points.
In case of commercial hackathons, which are NOT organized in collaboration with LUT, but is affiliated with an another University and are minimum of 24 hours in lenght and another university does grand study points, student can follow AHOT process for potential study point acceptance.

Evaluation scale / criteria
Passed/failed, continuous evaluation (no exam).

While evaluating the success in the course the following aspects are to be considered: Approach and solution to the problem, Technical implementation, Participation and Event supportive spirit, Final presentation, Final documentation.

The course is related to UN's Sustainable Development Goals (SDG):2 zero hunger, 3 good health and well-being, 4 quality education, 5 gender equality, 6 clean water and sanitation, 7 affordable and clean energy, 8 decent work and economic growth, 9 industry, innovation and infrastructure, 10 reduced inequalities, 11 sustainable cities and communities, 12 responsible consumption and production, 13 climate action, 16 peace, justice and strong institutions, 17 partnership for the goals

Study materials

EN: Detailed course materials for each implementation are published in the course wikipage: www.code-camp.fi

Completion method and assessment items	Recurrence	Credits
Method 1		1-6 cr
Course Completion		1-6 cr

CT30A8912 Software and system architectures

CT30A8912 Software and system architectures

Abbreviation: CT00CL99

Curriculum period	2025-2026

Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Software Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Kari Smolander, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs)

Prerequisites

EN: Bachelor's thesis or degree completed. Understanding of programming and Internet.

Equivalences to other studies

CT60A7510 Design Patterns

Learning outcomes

EN: The student understands the role of architecture in the development of software and information systems and has the basic skills of how to design and describe architecture. The student can identify architecturally significant requirements and evaluate designed architectures with requirements. The student also understands the challenges of modern distributed architectures and problems of integration.

Content

EN: The course centers around software architecture design and meeting the needs of the stakeholders of the system. The contents include basics of software and systems architecture, identifying architecturally significant requirements, designing software architecture with views, and evaluating software architectures. In addition, wider concepts of enterprise architecture and integration are introduced to put architectures in their context. The course includes a large practical design work that goes through these concepts.

Additional information

EN: Moves to periods 3 and 4.

Study materials

EN: The course material will be given during the course in Moodle.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
¤LAB/LUT: Course Completion		6 cr
Method 2	Recurrence 1: 3. period-4. period	6 cr
¤LAB/LUT: Course Completion		6 cr

CT10A7022 Personal Literature Study

CT10A7022 Personal Literature Study

Curriculum period	2025-2026
Validity period	since 1 Aug 2025

Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Software Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Jari Porras, Responsible teacher Sanaul Haque, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs)

Equivalences (free text field)

EN: Replaces CT10A7021 Personal Literature Study

Learning outcomes

EN: The course deepens students' understanding of a research topic through a literature study.
At the end of this course students will be able to:

1. Identify the needs for literature study in a field of interest.

2. Formulate proper literature searches to cover the selected topic.

3. Demonstrate the knowledge of literature review techniques and tools.

4. Demonstrate academic skills in writing a report of the findings.

Content

EN: Selected type of literature study on a selected theme. Depending on the need, the literature study may follow the guidelines of systematic literature review, systematic mapping study, snowballing etc. Students will be introduced to these methods and possible tools in the beginning of the course. A list of selected themes for the possible literature reviews can be found at the course page in Moodle. Student may also propose his/her own topic (e.g. on the field of thesis work). The student contacts then instructor and agrees on the personal implementation of the study including the workload and the schedule. Students produce a report based on the literature by the end of the course semester (fall or spring).

Additional information

EN: The course can be done in lecture-based or online self-study mode. Lecture-based consist of lectures on different topics (fall, spring), while in online mode, students follow videos and other material provided on moodle pages (fall, spring, summer). Fall lectures are meant for doctoral students (focus on SLR), while spring lectures are for master's students (focus on snowballing).
The SDGs touched in this course depend heavily on the topic selected for the literature review.

Study materials

EN: Articles describing different literature approaches are pointed out in Moodle.
Videos describing the phases of literature reviews are given in Moodle.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 1. period-2. period Recurrence 2: 3. period-4. period Recurrence 3: Summer	6 cr
Course Completion		6 cr

CT70A3000 Software Maintenance

CT70A3000 Software Maintenance

Abbreviation: CT00CM04

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Software Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Saddam Mukta, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs)

Prerequisites

EN: CT60A0202 Basics of programming (previosly CT60A0201), CT60A2411 Object-oriented programming,C-T60A5103 Software Engineering Models and Modeling (previously CT60A5102).Bachelor's thesis or degree completed.

Learning outcomes

EN: 1. Work as software developers in the context of an existing code base
2. Know the best practices of software maintenance, including modern technical automation, management of technical debt, coding standards, refactoring, and design patterns
3. Learn about software evolution
4. Know how to produce and use reusable software

Content

EN: In industrial practice, software developers are often confronted with already existing software systems that need to be maintained, reused or evolved. This requires specific skills to understand the design and implementation of an existing system and which parts need to be modified, to build software systems that are easier to maintain, and to design systems with reuse and evolution in mind from the very start.
This course will thus study a variety of techniques, tools and methodologies to help building software systems that are easier to understand, maintain, reuse and evolve.

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG): 9 industry, innovation and infrastructure and 12 responsible consumption and production

Study materials

EN: April, A., ; Abran, A. (2012). Software maintenance management: evaluation and continuous improvement. John Wiley ; Sons.Other material listed in the course website.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
¤LAB/LUT: Course Completion		6 cr
Method 2	Recurrence 1: 3. period-4. period	6 cr
¤LAB/LUT: Course Completion		6 cr

CT70A9300 Software engineering seminar

CT70A9300 Software engineering seminar

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	4 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Software Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Sami Hyrynsalmi, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs)

Prerequisites

EN: Bachelor's thesis or degree completed.

Learning outcomes

EN: The student can write a literature-based research report on a given subject. She can search and use literature systematically and understands the quality differences between various literature sources. The student achieves deep understanding of the selected software engineering subject in the course theme that varies yearly.

Content

EN: Research reporting. Finding and using software engineering literature. Systematic literature and mapping studies. Introduction to the seminar theme (changes yearly). Selecting a topic for the study. Individual working on the topic. Writing a research report. Presenting research.

Additional information

EN: Only Software engineering students allowed.

Study materials

EN: Topic-specific literature.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	4 cr
Course Completion		4 cr

CT80A0200 Software Business

CT80A0200 Software Business

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Software Engineering 100%

Responsible persons	Jonna Naukkarinen, Administrative person Sami Hyrynsalmi, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs)

Prerequisites

EN: Bachelor's thesis or degree completed.

Equivalences to other studies

CT60A7322 Software Business Development

CT70A6100 Advanced Course on Software Business

Equivalences (free text field)

EN: The course replaces old courses CT60A7322 Software Business Development and CT70A6100 Advanced Course on Software Business.

Learning outcomes

EN: After completing the course, the student has knowledge of basic mechanisms of the software-intensive business markets, as well as revenue and business models of software companies.

Content

EN: The course presents economical theories seen in the software industry as well as covers different revenue and business models. Finally, the course introduces the internationalization models of software-intensive companies.

Additional information

EN: The course is offered either as an anytime-course or a guided, hybrid course in Lahti campus. The anytime-course can be started at any point of the year.

The course is related to UN's sustainable development goals (SDG): 8 decent work and economic growth; 9 industry, innovation and infrastructure.

Study materials

EN: The course book (Buxmann et al. 2013) and the materials given by the teacher.

Literature

Buxmann, P., Diefenbach, H., Hess, T. (2013) The Software Industry: Economic Principles, Strategies, Perspectives. Springer-Verlag Belin.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr
Method 2	Recurrence 1: Summer-Summer	6 cr
Course Completion		6 cr

YTS010400 System Theory and System Interdependence

YTS010400 System Theory and System Interdependence

Curriculum period	2025-2026
Validity period	since 1 Aug 2025

Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Social Sciences 100%
Responsible persons	Tarja Pettinen, Administrative person Antti Silvast, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Social sciences

Prerequisites

EN: Bachelor's degree or alike in an appropriate field in the social sciences or communication sciences that gives eligibility to enrol into the master's program.

Learning outcomes

EN: After completing this course, the students will:

- Understand the meaning of social systems and principles of system theory and its main concepts
- Know how to deploy system theory to analyse empirical phenomena
- Understand socio-technical system change and reproduction
- Know similarities and differences regarding other approaches and concepts.

Content

EN:

- Introduction to system theory; what are social systems; what are socio-technical systems?
- The key concepts of system theory
- Systems' relationship to environment and other systems; what are subsystems
- System change and reproduction
- The role of communication in systems
- Open and closed systems
- System stratification, integration and disintegration
- System theory's similarities and differences regarding other key social theory approaches

Additional information

EN: Only for students of social sciences and communication sciences.

Study materials

EN: The literature will be announced at the beginning of the course.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 4. period	5 cr
Course Completion		5 cr

YTS011500 Natural Resources Policy and Governance

YTS011500 Natural Resources Policy and Governance

Curriculum period	2025-2026
Validity period	since 1 Aug 2025

Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Social Sciences 100%
Responsible persons	Tarja Pettinen, Administrative person Anna Salomaa, Responsible teacher
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Social sciences

Prerequisites

EN: Students need to have a demonstrated competence in social sciences to attend.

Learning outcomes

EN: After completing this course, the students will be able to:
· Understand major institutions of natural resource governance in different contexts and scales

· Understand different theories on natural resources governance (including adaptive governance and transformative governance)

· Describe relevant research methods

· Interpret dynamics and agency in context of natural resources governance and use critical thinking

· Apply key concepts and relevant theories

Content

EN: Content:
· Governing natural resources in local, national and global contexts

· Major governance institutions and organizations

· Key theories on natural resources and environmental governance

· Social, economic and ecological questions related to natural resource policies and governance

· Key research methods on natural resources governance

· Worklife knowledge and skills

Use of AI applications: AI is used in specific tasks

Additional information

EN: Only for students of MSc programme in Sociotechnical Systems and Sustainability Transitions.
The course is related to UN's Sustainable Development Goals (SDG): 6, 7, 8, 9, 10, 11, 12 ,13, 14, 15, 16, 17.

Study materials

EN: Vatn, Arild (2016) Environmental governance. Institutions, policies and actions. Edward Elgar.
Nunan, Fiona (ed.) 2020. Governing renewable natural resources. Theories and frameworks. Routledge.

Other materials will be announced in the beginning of the course.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 4. period	5 cr
Course Completion		5 cr

A380A0131 Business Relationships in International Value Networks

A380A0131 Business Relationships in International Value Networks

Abbreviation: A300CE15

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LBS, Business Administration 100%
Responsible persons	Axel Zehendner, Responsible teacher Suvi Tiainen, Administrative person
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Business, administration and law

Prerequisites

EN: B.Sc. (Econ. ; Bus. Adm.) General studies

Learning outcomes

EN: The aim of the course is to familiarize students with different business relationships in international value networks, management of relationships and networks, and characteristics of supplier relationships and collaborative networks.
Upon completion the course students are able to

- understand the main concepts and theoretical backgrounds of collaboration and networks

- analyze the benefits and challenges of relationships and networks

- define supplier relationships

- participate in the development of supplier supplier relationships.

Content

EN: - The concepts and theories of collaboration and networking
- The benefits and challenges of collaboration

- Management of collaboration and networks, and supplier relationship management

Additional information

EN: Course is available for following students:

- LUT Business School students
- exchange students in business studies
- LAB business degree students
- Engineering students with a minor in business studies

The course is organized two times in an academic year: period 2 and period 4.

Moodle-based online course.

No contact teaching: so the course does not exist in TimeEdit /timetable) The teacher contacts the students every week via Moodle messages.

NB! After being accepted to the BRIVN course especially exchange students must make sure that they use LUT email and can receive Moodle messages, which is essential for completing the course.

Please be informed that if you miss the deadline for enrolling a group for the case assignment in Moodle, you cannot continue the course. The enrolling period is one week from the beginning of the course.

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The course is related to UN's Sustainable Development Goals (SDG): 17 partnership for the goals.

Study materials

EN: Selection of journal articles and assigned readings, teaching videos and presentations.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 2. period, 4. period	6 cr
¤LAB/LUT: Course Completion		6 cr
Method 2	Recurrence 1: 2. period, 4. period	6 cr
¤LAB/LUT: Course Completion		6 cr

A130A0551 Organizational Behaviour

A130A0551 Organizational Behaviour

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LBS, Business Administration 100%
Responsible persons	Anna-Maija Nisula, Responsible teacher Suvi Tiainen, Administrative person
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Business, administration and law

Learning outcomes

EN: The goal of the course is to familiarize students with the organizational behavior as a theoretical phenomenon. The course focuses on human behavior, factors affecting human behavior and consequences of human behavior in organizations.
After completing the course students should be able to:

- define the key concepts of organizational behavior and identify these concepts by definition

- understand and describe the key theoretical entities that are composed by the association of the basic concepts.

Content

EN: The course focuses on human behavior in organizations, addressing it as a phenomenon at the individual, team, and organizational levels, all of which are interconnected. At the individual level, central themes include personality, psychological capital, values, perceptions, decision-making, attitudes, motivations, and moods/emotions. At the group or team level, central themes revolve around team or group management, group dynamics, power dynamics, politics, conflicts, and negotiation strategies for team behavior. At the organizational level, central themes involve organizational structure, culture, and change management. Since groups and organizations are comprised of individuals, it's crucial to understand individual behaviors, which influence the behaviors of other individuals (groups and organizations) and vice versa. Group and organizational factors also influence individual behavior.

Additional information

EN:
This course is on-line course and emphasizes students'; self-directed learning via Moodle assignments

Study materials

EN: 1. Robbins, S.P. & Judge, T. A and Campbell. (2010). Organizational Behaviour. Edition, New Jersey; Pearson/Prentice Hall.
2. Materials announced by the lecturer.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr
Method 2	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr

A130A0620 Basics in MS Excel for Business Students

A130A0620 Basics in MS Excel for Business Students

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	Pass-Fail
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LBS, Business Administration 100%
Responsible persons	Sanna Heinänen, Responsible teacher Suvi Tiainen, Administrative person
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Business, administration and law

Prerequisites

EN: No preliminary studies required. Basic knowledge of MS Excel recommended.

Learning outcomes

EN: By the end of the course, students are able to use and develop basic functions for data analysis relating to business studies and needs.

Content

EN: The course is based on independent study and can be carried out any time during the academic year. During the course, students are learning the basics of MS Excel for business studies. The course includes self-learning videos and documents as well as web-based exercises. The topics include formatting, drawing graphs, basic mathematic formulas, lookup formulas and working with pivot tables and dashboard. The course does not require preliminary studies. The basic knowledge of MS Excel recommended.

Study materials

EN: Course materials

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 1. period-Summer	3 cr
Course Completion		3 cr
Method 2	Recurrence 1: 1. period-Summer	3 cr
Course Completion		3 cr

A380A0400 Professional Selling

A380A0400 Professional Selling

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LBS, Business Administration 100%
Responsible persons	Jarkko Niemi, Responsible teacher Suvi Tiainen, Administrative person
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Business, administration and law

Learning outcomes

EN: Students will learn
- to critically evaluate strategies related to international marketing and sales management

- to understand the process of personal selling in industrial marketing

- to evaluate the impact of business decisions and administrative practices

- to analyze managerial challenges in international marketing environment

- to apply relevant business skills

Content

EN: This course provides an introduction to personal selling and modern sales management within the international business-to-business (B2B) environment. By the end of the course, students will have honed their personal selling skills, gained an understanding of sales management dynamics in a B2B context, and applied sales strategies in a competitive simulation. The course is structured into two main parts: the first part focuses on personal selling and professionalism in sales, culminating in sales negotiation role plays. The second part focuses on modern sales management, featuring a computer-based simulation game. Students' performance will be evaluated through a combination of assignments (30 %), participation in role-plays (20 %), and a final exam (50 %). The skills and knowledge acquired on this course are directly applicable to careers in sales, marketing, and business management, but also to many other work-life contexts.

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG): 3 good health and well-being, 8 decent work and economic growth, 9 industry, innovation and infrastucture

Study materials

EN: Assigned readings, lectures, and sales management simulation game.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course completion		6 cr

A130A0680 Statistics for Economics

A130A0680 Statistics for Economics

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LBS, Business Administration 100%
Responsible persons	Iryna Maliatsina, Responsible teacher Suvi Tiainen, Administrative person
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Business, administration and law

Learning outcomes

EN: After the course, the students will have a general understanding of statistics and fundamentals of statistical inference, will be able to apply the basic statistical tests to analyse quantitative data, and will be able to use statistical software when describing data and applying the basic statistical analysis methods.

Content

EN: The basic concepts and issues in statistical inference. Sampling. Graphical and numerical description of data. Use of probability distributions. Parameter estimation and statistical testing. The basic tests to analyze quantitative data, and properly selecting the appropriate tests. Use of statistical software package.

Additional information

EN: Course is only available for students who are studying in Bachelor’s Programme in Sustainable International Business.

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The course is related to UN's Sustainable Development Goals (SDG): 4 quality education

Study materials

EN: 1) Lecture and exercise materials
2) e-book: Ross, S. M. Introductory statistics. Academic Press, 2017

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course completion		6 cr

A380A0500 Introduction to Corporate Social Responsibility and Sustainability

A380A0500 Introduction to Corporate Social Responsibility and Sustainability

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LBS, Business Administration 100%
Responsible persons	Pasi Heikkurinen, Responsible teacher Suvi Tiainen, Administrative person
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Business, administration and law

Learning outcomes

EN: This course aims to familiarize the students with the basics of corporate social responsibility (CSR) and sustainability, including common critiques of these concepts as well as their potential to achieve positive change. During the course, students will actively learn about and reflect on various sustainability issues and topics affecting businesses operating in a global environment, and possible ways for companies to address these issues through CSR and sustainability strategies, practices and interactions with stakeholders. Guest lectures and class exercises give the students an opportunity to apply their knowledge to actual business practice. Finally, students can improve their professional skills (e.g. communication and interaction skills) during the course through class discussions and group assignments.
Upon completion of the course, students should be able to:

1) Understand and critically examine key concepts and frameworks related to CSR and sustainability.

2) Recognize and assess various environmental, social, economic and ethical issues caused by, and affecting, companies operating in a global context.

3) Distinguish and analyse various types of CSR and sustainability strategies, practices and other ways of addressing sustainability issues.

4) Apply theoretical frameworks and research findings related to CSR and sustainability to real-life phenomena and business practice.

5) Produce CSR and sustainability-related texts and materials.

Content

EN: CSR and sustainability frameworks and concepts, environmental, social, economic, and ethical issues, CSR and sustainability strategy, CSR and sustainability practice, activism, reputation, corporate crises, communications, governance, digitalization, globalization, supply chain sustainability, sustainable investing, and cross-sector interactions.

Additional information

EN: Contact teaching
**

Other additional information: The course is related to all UN's Sustainable Development Goals (SDGs).

Study materials

EN: Rasche, A., Morsing, M., & Moon, J. (Eds.). (2017). Corporate Social Responsibility: Strategy, Communication, Governance. Cambridge University Press: Cambridge.
Lecture slides and materials.

Additional readings, videos and course materials announced in the syllabus and/or distributed during lectures.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period	6 cr
Course Registration		0 cr
Course Assessment		6 cr
Method 2	Recurrence 1: 3. period	0 cr
Course Registration		0 cr

A380A0310 Services Marketing and Customer Experience Management

A380A0310 Services Marketing and Customer Experience Management

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LBS, Business Administration 100%
Responsible persons	Heini Vanninen, Responsible teacher Suvi Tiainen, Administrative person
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Business, administration and law

Prerequisites

EN: A130A0010 Markkinoinnin perusteet or equivalent basic marketing course.

Learning outcomes

EN: The aim of the course is to provide the students with the knowledge of most central issues of services marketing and customer experience management. After completion of the course the students are able to:
- Identify the key concepts and issues related to services marketing and how the nature of services affects marketing activities
- Demonstrate how services can be designed according to the needs of customers
- Plan service blueprints and understand services marketing from a holistic viewpoint, including the background work and processes that are needed to create and deliver an experience to the customer
- Analyze and audit existing services marketing processes by using the principles of service design

Content

EN: Foundations for services marketing (e.g. nature of services, services marketing mix, service design). Understanding customers and customer journey. Aligning service design and standards, service quality. Delivering and performing service, managing service promises.

Additional information

EN: Lectures in classroom.

Study materials

EN: Zeithaml, V.A., Bitner, M.J., Gremler, D.D. (2018) Services Marketing: Integrating Customer Focus Across the Firm with Connect Access.(7th ed.). New York: NY. McGraw-Hill Education.Textbook: ISBN: 978-1260051988Other readings and assignments announced before / in the class

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period	3 cr
Course Completion		3 cr

A380A6060 Applied International Business

A380A6060 Applied International Business

Abbreviation: AIB

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LBS, Business Administration 100%
Responsible persons	Sina Mortazavibabaheidari, Responsible teacher Daniel Stabler, Responsible teacher Suvi Tiainen, Administrative person
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Business, administration and law

Recommended prerequisites

A380A7001 Introduction to International Business

Learning outcomes

EN: After taking the course the student should be able to:
· understand and apply relevant theories in the context of international business practice

· discuss how the practice of international business can influence the grand challenges our world is facing;

· understand how business scholars can influence the practice of international business;

· evaluate international business challenges that companies face and offer practical recommendations;

· retrieve and analyze international business data to facilitate managerial decision-making

Content

EN: This course covers practical challenges faced by international business enterprises including sustainability, cross-cultural and social issues, internationalization, innovation and entrepreneurship.

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG):8 decent work and economic growth,11 sustainable cities and communities, 12 responsible consumption and production,17 partnership for the goals

Study materials

EN: Study materials including journal articles from magazines such as Harvard Business Review and MIT Sloan Management Review as well as practical business cases are made available on the course Moodle page.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period	6 cr
Course Completion		6 cr

A380A6000 Cross-Cultural Encounters

A380A6000 Cross-Cultural Encounters

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LBS, Business Administration 100%
Responsible persons	Tanja Karppinen, Responsible teacher Suvi Tiainen, Administrative person
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Business, administration and law

Learning outcomes

EN: By the end of the course, students will know why it is important to understand and appreciate cultural differences both in business and especially private life. Students will be able to explain the basic concepts of intercultural communication by the main course themes: cultures and communication, verbal and nonverbal communication, national stereotypes, intercultural sensitivity, cross-cultural interaction, culture shock, adaptation, expatriate assignments. Students will be able to describe themselves as an intercultural communicator, recognize symptoms of culture shock in their own life and especially know how to make intercultural adaptation process easier.

Content

EN: The purpose of the course is to develop students' abilities to understand and appreciate cultural differences both in business and especially private life.
- cultures and communication
- verbal and nonverbal communication
- national stereotypes
- intercultural sensitivity
- cross-cultural interaction
- culture shock
- adaptation
- intercultural effectiveness
- expatriate assignments

Additional information

EN: Contact teaching, learning and interaction in class.

Study materials

EN: Reading material for the course provided by the lecturers.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period	3 cr
¤LAB/LUT: Course Completion		3 cr

A380A0000 Cross-Cultural Issues in International Business

A380A0000 Cross-Cultural Issues in International Business

Abbreviation: A300CE12

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LBS, Business Administration 100%
Responsible persons	Gregory OShea, Responsible teacher Anna Sidorenko, Responsible teacher Suvi Tiainen, Administrative person
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Business, administration and law

Prerequisites

EN: B.Sc. (Econ. ; Bus. Adm.) General studies

Learning outcomes

EN: The goal of the course is to give an understanding of how culture affects international business and advance students' global mindset by giving conceptual tools to increase their intercultural competence. After completing the course the students will be able to:

1. understand, define and discuss culture in general and in the context international business

2. explain cultural orientations towards time, space and context.

3. analyze and compare national cultures according to dimensions defined by studies of Hofstede, Trompenaars, and the GLOBE project.

4. reflect upon the relationship between culture, organizations and management.

5. evaluate the effects of the culture on various elements of international business, including marketing, negotiations and international teams.

Content

EN: The Concept of culture; dimensions of culture in business (Hall, Hofstede, Trompenaars, and the GLOBE project). The limits of globalization from a cultural perspective. The role of culture in communication, negotiations, and management. Cross-cultural issues in international teams. Standardization and adaptation in international marketing. Country cases of cultural differences .

Additional information

EN: Opintojakso liittyy YK:n kestävän kehityksen tavoitteisiin (SDG): 5 sukupuolten välinen tasa-arvo, 10 eriarvoisuuden vähentäminen

Study materials

EN: 1. Browaeys ; Price: Understanding Cross-Cultural Management (3rd ed), Pearson, 2015 2. Lecture slides 3. Additional material distributed in class and via Moodle

Literature

https://lut.primo.exlibrisgroup.com/permalink/358FIN_LUT/1oevkkm/alma991875263906254
https://lut.primo.exlibrisgroup.com/permalink/358FIN_LUT/1oevkkm/alma991982971606254

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period	6 cr
¤LAB/LUT: Course Completion		6 cr

A380A0300 Introduction to Digital Marketing

A380A0300 Introduction to Digital Marketing

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LBS, Business Administration 100%
Responsible persons	Titta Pitman, Responsible teacher Suvi Tiainen, Administrative person
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Business, administration and law

Learning outcomes

EN: After completing the course, the student should be able to:
1. Define the key concepts of digital marketing.

2. Evaluate suitable digital marketing communication tactics to attract, convert, retain and grow customers.

3. Analyze digital analytics data and make data-driven insights.

Content

EN: Web design, conversion optimization, content marketing search engine optimization, online advertising, social media marketing, web analytics.

Study materials

EN: Articles and online material informed/provided by the lecturer

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 4. period	3 cr
Course Completion		3 cr
Method 2	Recurrence 1: 4. period	3 cr
Course Completion		3 cr

BM40A0202 Foundations of Computer Science

BM40A0202 Foundations of Computer Science

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5

University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Computational Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Zhisong Liu, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Equivalences (free text field)

EN: BM40A0201 Tietojenkäsittelytieteen perusteet 6 op.

Learning outcomes

EN: By the end of this course, students will have a strong grasp of fundamental computing principles, including logic circuits, data representation, and algorithmic problem-solving. They will understand key components of computer architecture, such as the CPU, memory hierarchy (including RAM and cache), and the basic machine cycle (fetch, decode, execute). Students will explore the design and function of the ALU, registers, buses, and control units, along with an introduction to assembly language and its role in low-level programming. Additionally, they will learn about theoretical models of computation, such as the Turing machine, to develop a deeper understanding of computational limits and efficiency. The student can outline applications of computer science methods within different fields and become acquainted with the field's educational, professional, and ethical questions.

Content

EN: Logic and computer: logic and discrete methods, logical circuits, computer architecture and limitations, machine language and system programs. Applications of computer science: programming paradigms, computational methods and intelligence, future aspects of computer science and technology. Computer science in education, research and as a profession, ethics.

Study materials

EN: Lecture material, which is based mainly on following source books:
Boberg J.: Johdatus tietojenkäsittelytieteeseen, Turun yliopisto, 2012.

Brookshear G., Brylow D.: Computer Science - An overview, 12th Edition, Addison-Wesley, 2015.

Reed, D.: Balanced Introduction to Computer Science, 3rd Edition, Pearson 2011.

Råde L., Westergren, B.: Mathematics handbook for science and engineering, 3rd ed., Studentlitteratur, 1995.

Tietotekniikan peruskirja, toim. Paananen J., Docendo, 2005.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period, 3. period-4. period	6 cr
Course Assessment		6 cr
Course Registration		0 cr

BM20A8801 Discrete Mathematics

BM20A8801 Discrete Mathematics

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5

University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Computational Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Tapio Helin, Responsible teacher Chuntao Chen, Responsible teacher
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Some basic mathematics & statistics course.

Equivalences to other studies

BM20A6600 Discrete Models and Methods

Learning outcomes

EN: Upon completion of the course the student is expected to know and understand the basic concepts of discrete mathematics, be able to formulate models representing simple discrete problems and solve them.

Content

EN: Main concepts in mathematical reasoning, relations, combinatorics and graph theory.

Study materials

EN: Lecture materials in Moodle. Source books include but are not limited to:
Dossey, Otto, Spence, Vanden Eynden: Discrete mathematics, Pearson 5th edition, 2006.

Richard Johnsonbaugh, Discrete mathematics, Prentice hall, 6th edition, 2005.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 4. period	3 cr
Course Assessment		3 cr
Course Registration		0 cr

BM20A7102 Statistics II

BM20A7102 Tilastomatematiikka II

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	4 cr
Languages	Finnish, English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Computational Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Jarkko Suuronen, Responsible teacher
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Required: Basic knowledge of Julia, Matlab, Python, or R programming. Statistics I or equivalent knowledge.

Compulsory prerequisites

BM20A8601 Statistics I

or

BM20A1401 Statistics I

or

BM20A1401A Tilastomatematiikka I

or

A130A0650 Basics of Statistical Research

or

A130A0650A Tilastollisen tutkimuksen perusteet

or

BM20A9301 Statistics

Learning outcomes

EN: The students expand their knowledge of Bayesian inference and time series analysis. They can formulate more advanced statistical models, and apply them in science and technology.

Content

EN: Bayesian inference: likelihood, prior and posterior distributions, marginal likelihood. Bayesian model selection. Time series and spectrum analysis.

Additional information

EN: ***
The course is related to UN's Sustainable Development Goals (SDG): 4 quality education

Study materials

EN: Anthony J. Hayter, "Probability and Statistics for Engineers and Scientists"

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 4. period	4 cr
Course Registration		0 cr
Course Assessment		4 cr
Method 2	Recurrence 1: 4. period	4 cr
Course Assessment, in English		4 cr
Course Registration, in English		0 cr

BL40A2011 Introduction to Cyber-Physical Systems

BL40A2011 Introduction to Cyber-Physical Systems

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	4 cr

Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Electrical Engineering 100%
Responsible persons	Pedro Juliano Nardelli, Responsible teacher Minna Loikkanen, Administrative person
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Scientific computing (python), basics of probability theory (random variables), and basics of Boolean algebra (logic gates)

Learning outcomes

EN: After the course, the student will be able to:
(1) understand what cyber-physical systems (CPSs) are;

(2) define uncertainty, information, network, decision-making and action as concepts;

(3) analyze CPSs as constituted by three necessary layers with three cross-layer operations;

(4) indicate enabling technologies of CPSs;

(5) design and assess the performance of simple CPSs, as well as critically discuss their social impact.

Content

EN: 1) Introduction to CPSs;
2) Core concepts: system, uncertainty, information, network, decision-making, and action;

3) The three-layers of CPSs;

4) Enabling information and communication technologies;

5) Examples of CPSs and their social impact.

Note: The use of generative tools (the so-called artificial intelligence or simply AI) are discouraged as the proposed tasks are designed for human learning; nevertheless the so-called AI applications can still be used according to general LUT policies.

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG): 3 good health and well-being; 7 affordable and clean energy; 9 industry, innovation and infrastructure; 11 sustainable cities and communities; 12 responsible consumption and production; 13 climate action.

Study materials

EN: Textbook, simulations in python (using deepnote platform) produced by the teachers and other suggested materials.

Literature

Nardelli, Pedro HJ. Cyber-physical Systems: Theory, Methodology, and Applications. John Wiley & Sons, 2022. Available at LUT Primo.

https://www.wiley.com/en-us/Cyber+physical+Systems%3A+Theory%2C+Methodology%2C+and+Applications-p-9781119785187

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	4 cr
Course Completion		4 cr

BL40A1812 Introduction to Embedded Systems

BL40A1812 Introduction to Embedded Systems

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Electrical Engineering 100%
Responsible persons	Minna Loikkanen, Administrative person Pietari Puranen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Basics of C-programming

Equivalences (free text field)

EN: Replaces the course BL40A1811 Johdanto sulautettuihin järjestelmiin, 6 ECTS.

Learning outcomes

EN: The course is an introduction to embedded systems. Upon completion of the course the student will be able to: 1. identify different microprocessor types and peripheral components in embedded systems, 2. describe the operation principles of an embedded system and its peripheral components, 3. program and test applications to an embedded system by using C language.

Content

EN: Architecture of a microprocessor, instruction set and operation, microcontrollers, memories, peripherals, embedded system design, programming and development of applications, embedded system design examples.

Use of AI applications

Large language models can be used for deepening conceptual knowledge of course topics (for example when preparing for the exam) and as an aid for coding in the group assignment. However, each group must also be able to explain all code generated by artificial intelligence.

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG): 7 Affortable and clean energy, and 9 Industry Innovation and Infrastructure.

Study materials

EN: Lecture material based on F. Vahid, Tony Givargis, *Embedded System Design: A Unified Hardware/Software Introduction*
ELEGOO The Most Complete Starter Kit (including Arduino UNO R3) and Arduino Mega 2560 R3 (borrowed to students who attend in exercises and project work at Lappeenranta campus, 1 set/project group)

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr
Method 2	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr

BL30A0001 Electric Circuits

BL30A0001 Electric Circuits

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	4 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Electrical Engineering 100%
Responsible persons	Minna Loikkanen, Administrative person Mehar Ullah, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: Upon completion of the course the student will be able to: 1. solve simple DC and AC systems with different calculation methods, 2. calculate with phasors, perform transformation from time domain to phasor domain and vice versa, 3. determine and explain the concept of impedance, 4. determine and explain the concepts of active power, reactive power, apparent power, 5. determine resonance frequency. 6. explain the concept of three-phase system.

Content

EN: Solution methods for DC and AC circuits: Ohm's law, Kirhhoff's voltage and current law, mesh current and node-voltage methods, phasor calculation, resonant circuits, sinusoidal quantities, symmetrical three-phase system, power calculation, star-delta and delta-star transformations.

Additional information

EN: In person lectures will only be in Lappeenranta campus. The lectures will be streamed for students in Lahti campus.
In the course will be held both English and Finnish exercise groups. Exercise groups in Lappeenranta and in Lahti.

Replaces the course BL30A0000 Sähköiset piirit, 4 ECTS.

***
The course is related to UN's Sustainable Development Goals (SDG):

7 affordable and clean energy

Study materials

EN: Course material in Moodle learning environment including lecture slides and calculation exercise materials and literature: book Electric circuits by Nilsson, J.W.

Literature

The learning material is based on the latest research, books and is distributed to students in Moodle in the form of slides, videos. In this course mostly we will be using book Electric circuits by Nilsson, J.W. In the ex-

tra material tab in Moodle there will be some extra videos that can be used to clear the concepts of some topics.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	4 cr
Course Registration		0 cr
Course Assessment: Written examination		4 cr
Method 2	Recurrence 1: 3. period-4. period	4 cr
Course Registration		0 cr
Continuous Assessment + Test		4 cr
Method 3	Recurrence 1: 3. period-4. period	4 cr
Course Registration		0 cr
Course Assessment: Written examination		4 cr
Method 4	Recurrence 1: 3. period-4. period	4 cr
Course Registration		0 cr
Continuous Assessment + Test		4 cr

BL30A0350 Electromagnetism and Circuit Analysis

BL30A0350 Electromagnetism and Circuit Analysis

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Electrical Engineering 100%
Responsible persons	Minna Loikkanen, Administrative person Cassia Santos Nunes Almeida, Responsible teacher Paula Immonen, Responsible teacher
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Recommended Prerequisites: BL10A0102 - Basics of Electrical Engineering (2 cr) and LES10A020 - Engineering Physics (3 cr).

Learning outcomes

EN: After completing the course, the student will be able to:

1. explain in your own words the key mechanisms of generation of electromagnetic radiation and the behavior of electromagnetic waves in a medium
2. explain Ampère's, Faraday's and Lenz's laws and the Lorentz force using examples and tell why these equations are needed in electrical engineering
3. explain the functions of antennas
4. explain what is meant by transmission line theory and how a transmission line is modeled using distributed parameters
5. explain how the current in a DC circuit containing inductance behaves in changing situations and what is meant by mutual inductance
6. explain why an electromotive force is induced in a conductor moving in a magnetic field and why a current-carrying conductor in a magnetic field is affected by a force

7. form analytical equations/calculate the magnetic flux, magnetic field strength and magnetic flux density of a magnetic circuit using basic equations
8. apply the theories presented in the course to solving simple electromagnetic problems and be able to evaluate the reasonableness of the results obtained
9. solve electrical circuits using systematic methods

10. define the basic methods used to describe transmission networks

11. explain the phenomena of change in electrical circuits and calculate changes in electrical circuits.

12. solve an electrical circuit voltage or current change in e.g. when a step-voltage is applied to the circuit.

Content

EN: Electromagnetic waves, basic phenomena of electromagnetism (magnetic force, magnetic field, electromagnetic induction), laws and applications, antennas, transmission lines and magnetic circuits. Systematic calculation methods for electrical circuits, such as the identification method and the Heaviside method. Laplace transformation and Laplace inverse transformation. Phenomena of change in electrical RLC circuits (voltage or current changes in the circuit). Methods to describe transmission networks.

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG): 4 quality education, 5 gender equality, 7 affordable and clean energy, 8 decent work and economic growth, 9 industry, innovation and infrastructure

Literature

Ulaby, Fawwaz T. Fundamentals of Applied Electromagnetics, Prentice Hall, 2001. Print.

Ida, Nathan. Engineering Electromagnetics, Springer International Publishing, 2015. Web.

Nilsson, James William, and Susan A Riedel. Electric Circuits. Global edition. Harlow, England: Pearson, 2015. Print.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr

BL40A2601 Wind Power and Solar Energy Technology and Business

BL40A2601 Wind Power and Solar Energy Technology and Business

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Electrical Engineering 100%
Responsible persons	Minna Loikkanen, Administrative person Katja Hynynen, Responsible teacher
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Equivalences to other studies

BL40A2600 Wind power and solar energy technology and business

Learning outcomes

EN: Upon completion of the course the student will be able to:

1. model the process from wind energy into company turnover at the principle level,
2. identify and describe the key technologies related to wind power, the core business principles, environmental issues, energy policy and their development trends,
3. describe the mutual effects of wind power and electric power systems,
4. identify and describe the technologies related to solar power.,
5. describe the basic principle of photovoltaic cells,
6. estimate the performance and profitability of a PV plant.

Content

EN: Process modelling from kinetic energy of wind into company turnover and from solar radiation to turnover. Basic components of a wind power plant (turbine, gearbox, generator, power electronics, power electronics, tower), environmental effects of wind power, wind park planning, grid effects of wind power, economic feasibility of wind power under different circumstances, wind conditions in Finland. Solar energy technologies, operating principle of solar panels, PV solar power plant structure.

Company cooperation

There is visiting lecturer from a company in the course.

Use of AI applications

AI applications can be used in the course according to LUT's general AI-based tools policies.

Additional information

EN: ***
The course is related to UN's Sustainable Development Goals (SDG):

7 clean and affordable energy

8 decent work and economic growth

9 industry, innovation and infrastructure

12 responsible consumption and production

13 climate action

Study materials

EN: The learning material is based on the latest trends on wind power and solar energy development, and is distributed to students in Moodle learning environment.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	5 cr
Course Completion		5 cr

BL50A0021 Basic Electronics 1

BL50A0021 Elektroniikan perusteet 1

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English, Finnish
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT

Responsible organisation	LES, Electrical Engineering 100%
Responsible persons	Mikko Kuisma, Responsible teacher Minna Loikkanen, Administrative person Mohammad Khan, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Equivalences (free text field)

EN: Replaces the course Elektroniikan perusteet B 3 ECTS.

Learning outcomes

EN: Upon completing the course, the student will be able to:

- Identify key passive and active electronic components and describe their applications.
- Differentiate between analog and digital electronics.
- Define the concepts of amplification and filtering.
- Explain the operation and basic physical structure of an ideal semiconductor diode.
- Describe the function and applications of transistors and discuss their significance, along with integrated circuits.
- Describe the operating principles of digital logic gates and identify common logic functions.
- Recognize the key stages and materials involved in manufacturing electrical apparatus.
- Apply Ohm's law, Kirchhoff's voltage and current laws, and the concept of electrical power to simple electrical circuits.

Content

EN: Analog and digital signals, resistors, capacitors and inductors, filtering, amplification, semiconductors, diodes and transistors, digital logic gates, introduction to electronics manufacturing technology.

Additional information

EN:

- Hybrid course organized both in Lappeenranta and Lahti (locally/remotely)
- Use of AI tools: According to the university regulations
- The course is related to the UN's Sustainable Development Goals (SDG): 7 affordable and clean energy.
- This course is given both in English (3. period) and in Finnish (2. period).

Study materials

EN: The learning material is based on the latest research and is available to students through Moodle.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 2. period	3 cr
Course Completion		3 cr
Method 2	Recurrence 1: 3. period-4. period	3 cr
Course Completion (Junior University)		3 cr
Method 3	Recurrence 1: 3. period	3 cr
Course Completion, in English		3 cr
Method 4	Recurrence 1: 2. period	3 cr
Course Completion		3 cr

BL50A0210 Introduction to EMC

BL50A0210 Introduction to EMC

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Electrical Engineering 100%
Responsible persons	Minna Loikkanen, Administrative person Tommi Kärkkäinen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Equivalences to other studies

BL50A0201 Introduction to EMC

Learning outcomes

EN: Upon completion of the course the student will be able to:
1. recognise coupling mechanisms of electromagnetic interference (EMI) and describe the main principles to minimise EMI,
2. list the main effects of EMI and non-idealities of electrical components to the operation of an electrical apparatus,
3. describe the generation of electrostatic discharge (ESD) and the most important precautions in handling sensitive electronic devices and components.

Content

EN: Basic concepts of the electromagnetic compatibility (EMC). Conductive, capacitive, inductive and RF coupling of EMI. Non-idealities of components, electrostatic discharge (ESD), EMC legislation.
Use of AI applications

The use of AI tools to support learning is allowed and encouraged. AI must not replace the student's own efforts to learn. The general guidelines on the use of AI by LUT must be adhered to.

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG):
4 quality education,

7 affordable and clean energy,

12 responsible consumption and production.

Study materials

EN: Moodle material and web resources.
Moodle material is based on H.W. Ott: Noise Reduction Techniques in Electronic Circuits and other literature of the field.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 4. period	3 cr
Course Completion		3 cr
Method 2	Recurrence 1: 4. period	3 cr
Course Completion		3 cr

BH40A0102 Basics of Renewable Energy Engineering

BH40A0102 Basics of Renewable Energy Engineering

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Energy Technology 100%
Responsible persons	Aki Grönman, Responsible teacher Minna Loikkanen, Administrative person
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: Upon completion of the course the students will be able to: 1. describe the operation principle of various power plant types using renewable energy sources, 2. compare the benefits and disadvantages of power plants using renewable energy sources in relation to each other and conventional power plants, 3. understand the factors affecting power plant efficiencies, and 4. select suitable power plants for a given purpose. The course supports development of the following work life expertise and skills: Mathematics and natural sciences, practical application of theories, working independently, problem solving, information retrieval, time management and prioritizing tasks, analytical thinking skills.

Content

EN: Wind power, wind turbine types, water power, hydrogen economy and fuel cells, wave power, tidal power, biomass and biogas utilization, solar power, geothermal energy, principles and efficiency calculations of renewable energy power plants. The course is related to P2X theme.

Additional information

EN: Blended learning. The course is related to SDG 7: affordable and clean energy.

Study materials

EN: Lecture material in Moodle. Further material will be announced during lectures.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 4. period	3 cr
¤LAB: Course Completion		3 cr

BH50A0220 Energy Systems

BH50A0220 Energy Systems

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Energy Technology 100%

Responsible persons	Minna Loikkanen, Administrative person Samuli Honkapuro, Responsible teacher Eeva-Lotta Apajalahti, Responsible teacher Falah Alobaid, Responsible teacher Gustavo de Almeida, Responsible teacher Goncalo Mendes, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Understanding of basic units.

Learning outcomes

EN: Upon completion of the course the student will be able to 1. recognize the world's energy resources and the most central factors affecting their utilization, 2. describe different types of energy production processes 3. recognize the equipment and terminology related to energy technology, 4. describe typical energy distribution, 5. recognize benefits and drawbacks of energy systems, 6. define economic constraints to energy processes, and 7. explain the fundamentals of the electricity markets, including price formation principles and role of the key actors, 8) identify societal impacts and constraints of energy futures. Completion of the course supports the development of the following generic competences for working life: Information retrieval, practical application of theories, working independently, written communication and time management and prioritizing tasks.

Content

EN: Global energy resources and energy demand. Energy conversion processes and process equipment. Energy transfer and distribution systems. Environmental and social impacts of energy technology. Economics of energy systems. Fundamentals of electricity market. Energy futures.
Company cooperation: Not applicable.

Use of AI applications:

AI applications can be used for understanding concepts and searching for information, taking into account the constraints of the AI in source criticism. Students must provide the answers in assignments by own produced text. Students are not allowed to present AI-generated text as their own.

Additional information

EN: Blended learning
SDGs: 7 affordable and clean energy, 11 sustainable cities and communities.

Study materials

EN: Celik, Serdar, Sustainable Energy Engineering Fundamentals and Applications, 2023; Boyle, Godfrey, Renewable Energy: Power for a Sustainable Future, 2012; Lecture notes.

Literature

Celik, Serdar, Sustainable Energy Engineering Fundamentals and Applications, 2023.

Boyle, Godfrey, Renewable Energy: Power for a Sustainable Future, 2012.

Lecture notes, distributed to students in Moodle.

Supporting material for the Lectures, distributed to students in Moodle.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	5 cr
¤LAB: Course Completion		5 cr

BH40A1401 Fluid Mechanics I

BH40A1401 Fluid Mechanics I

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Energy Technology 100%
Responsible persons	Minna Loikkanen, Administrative person Ahti Jaatinen-Värri, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Tweet text

EN: Location: Lappeenranta; Lahti. The course will be lectured every other week in Lappeenranta and Lahti. See time table and Moodle for details

Learning outcomes

EN: Understands the basic concepts of fluid dynamics and is able to apply them
Understands the basics of hydrostatics and is able to apply them
Understands the basic flow phenomena, equations describing them is able to apply them to solve problems
Understands the working principles of different flow meters and is able to choose a correct flow meter for each application
Is able to apply skills accumulated during the course for pipe flow and is able to solve pipe flow problems.
Completion of the course supports the development of the following generic competences for working life: mathematics and natural sciences, practical application of theories, working independently, problem solving, and time management and prioritizing tasks.

Content

EN: 1) Introduction: general overview of fluid mechanics in different fields of engineergin, definition of fluid and Newtonian fluids, shear stress in fluid flow surface tension.
2) Hydrostatics: hydrostatic pressure, standard atmosphere, buoyancy and stability of floating bodies.

3) Integral equations: continuity equation (conservation of mass), momentum equation, angular momentum equation, energy equation and Bernoulli equation.

4) Pipe flow: pressure loss in pipes, pipes in series and parallel, solving pipe flow problems, friction in pipe flow.

5) Flow measurements: overview of flow temperature and pressure measurements, flow velocity measurements, volume/mass flow measurement techniques.

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG): 6 clean water and sanitation, 7 affordable and clean energy

Study materials

EN: Course text book: White, F. M., Fluid mechanics. 5th ed.
Additional material in Moodle.

Alternative text books:Munson, B. R., Young, D. F., Okiishi, T.H.: Fundamentals of Fluid Mechanics. Bohl, W.: Teknillinen virtausoppi (Technische Strömungslehre): Durst: Fluid Mechanics: An introduction to the Theory of Fluid Flows (e-book)Krause: Fluid Mechanics : With Problems and Solutions, and an Aerodynamic Laboratory (e-book)

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period	3 cr
¤LAB/LUT: Course Registration		0 cr
¤LAB/LUT: Course Assessment		3 cr
Method 2	Recurrence 1: 3. period	3 cr
¤LAB/LUT: Course Registration		0 cr
¤LAB/LUT: Course Assessment		3 cr

BH10A1900 Fundamentals of Energy Technology

BH10A1900 Fundamentals of Energy Technology

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	2 cr
Languages	English
Grading scale	Pass-Fail
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Energy Technology 100%
Responsible persons	Minna Loikkanen, Administrative person Ahti Jaatinen-Värri, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: Upon completion of the course a student 1. Understands the laws of thermodynamics and apply thermal properties, 2. understands the fundamentals of fluid mechanics and is able to solve typical problems, 3. Has understanding of the basics of heat transfer and is able to solve typical problems, 4. understands the different power generation technologies and is be able to calculate material and energy balances, and 5.
Independently study and follow progress of energy technology.
Completion of the course supports the development of the following generic competences for working life: know-how on own field, mathematics and natural sciences, practical application of theories, working independently,

Content

EN: Thermodynamics: basic concepts, thermodynamic properties, conservation equations, open system energy analysis, 1st and 2nd law of thermodynamics, thermodynamic cycles, Carnot efficiency, exergy.
Heat transfer: fundamentals, conduction, convection, heat exchangers, introduction to radiation.

Fluid Dynamics: hydrostatics, conservation of mass, linear momentum equation, Bernoulli equation, pipe flow.

Power plant engineering: Ideal and real Rankine cycles, gas turbine power cycle.

Bioenergy: Bioenergy in the world, biomass combustion, challenges in the biomass use, bioenergy in EU, future use of biomass.

Additional information

EN: The course is aimed for students who want to independently brush up their basic knowledge of subjects needed in Master';s studies.

Study materials

EN: Course materials in Moodle.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 1. period-Summer	2 cr
Course Completion		2 cr
Method 2	Recurrence 1: 1. period-Summer	2 cr
Course Completion		2 cr

BH50A0240 Introduction to Power Plant Engineering

BH50A0240 Introduction to Power Plant Engineering

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	4 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Energy Technology 100%
Responsible persons	Minna Loikkanen, Administrative person Jussi Saari, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Basic knowledge on thermodynamics: state of matter, state diagrams, mass and energy balances, concepts of enthalpy and entropy.

Learning outcomes

EN: The student can:
1. explain the basic processes of thermal power plants, their depiction in T,s charts, and what factors affect the efficiencies.

2. apply mass and energy balances in the calculation of various plants and their components.

3. calculate and depict the compression, expansion and heat transfer processes of power plant components.

3. calculate the costs of power and heat generation.

Content

EN: Ideal comparison processes of power plant cycles.
Thermal power plants and power plant processes.

Calculation of power plant processes, and costs.

Steam power plants (condensing and cogeneration), gas turbines, combined cycles.

Additional information

EN: Contact teaching, on Lappeenranta campus. Teaching is not recorded or streamed.
SDGs: 7 affordable and clean energy; 13 climate action

NOTE: This 4 ECTS course in meant only for minor studies, such as Energy Technology or Energy Economics.

Study materials

EN: Lecture, exercise and example materials uploaded to Moodle.
Water h,s diagram.

Literature

Energy conversion (2017). Goswami, D. Yogi, ed.; Kreith, Frank, ed.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	4 cr
Course Registration		0 cr
Course Assessment		4 cr

BH60A5901 Climate Solutions

BH60A5901 Climate Solutions

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Environmental Technology 100%
Responsible persons	Michael Child, Responsible teacher Annukka Ilves, Administrative person Sanni Väisänen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: The content and learning outcomes of the Climate Change course are based on:
- classifying climate change as a scientific phenomenon,
- explaining how it can be prevented (mitigation),
- summarizing how adaptation to it is possible.
In addition to discussing the scientific basis, the objectives of the course also include discussing the theme of climate change by:
- analyzing it as a global human challenge
- interpreting it as an ethical challenge to our understanding of human life
- commenting on it as a challenge related to the students' fields of study
- appraising it as a challenge regarding the students' personal roles as influencers

Content

EN: Introduction to Climate change: climate system, future of the climate, impacts, mitigation and adaptation, big issues, applied perspectives and assignments.

Additional information

EN: NOTE! BH60A7400 Climate.Now and BH60A5900 Climate Changeare alternative, both cannot be included in the degree!
***

Blended learning. Mandatory contact sessions once/month. Mandatory weekly group meetings.

***

The course is related to the UN's Sustainable Development Goals (SDG):

1 no poverty

2 zero hunger

3 good health and well-being

4 quality education

5 gender equality

6 clean water and sanitation

7 affordable and clean energy

8 decent work and economic growth

9 industry, innovation and infrastructure

10 reduced inequalities

11 sustainable cities and communities

12 responsible consumption and production

13 climate action

Study materials

EN: To be provided on course Moodle pages.

Literature

https://digicampus.fi/login/index.php

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	5 cr
Course Completion		5 cr

BH60A7200 Circular.now

BH60A7200 Circular.now

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English, Finnish
Grading scale	Pass-Fail
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Environmental Technology 100%

Responsible persons	Sanni Väisänen, Responsible teacher Annukka Ilves, Administrative person
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: After successfully completing the course, students are able to:
1. explain the targets of circular economy and understand possibilities to implement circular economy in different sectors,
2. understands capability of the selected products, production systems and services to fulfil the requirements of circular economy

Content

EN: Introduction to circular economy: circular economy aspects related to food systems, forest systems, product design, transportation sector and sharing economy.

Additional information

EN: ***The course is related to UN's Sustainable Development Goals (SDG):
7 affortable and clean energy, 9 industry, innovation and infrastructure, 11 sustainable cities and communities, 12 responsible consumption and production, 13 climate action.

NOTE! BH60A7200 Circular.Now and BH60A5401 Introduction to Circular Economy are alternative, both cannot be included in the degree!

Submitted tasks will be evaluated at the end of each period.

Company collaboration: The course utilizes video material recorded in collaboration with companies, showcasing real circular economy solutions across various industries.

Artificial intelligence: all kind of AI tools, including excess use of translation tools, is forbidden and will lead to failing the course.

Study materials

EN: Circular.Now MOOC material in DigiCampus.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 1. period-Summer	3 cr
Course completion		3 cr
Method 2	Recurrence 1: 1. period-Summer	3 cr
Course completion		3 cr

BH60A0002 Basic Course in Environmental Technology A

BH60A0002 Ympäristötekniikan perusteet A

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English, Finnish
Grading scale	General scale, 0-5

University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Environmental Technology 100%
Responsible persons	Mika Horttanainen, Responsible teacher Annukka Ilves, Administrative person Ursula Salakka, Responsible teacher Mari Hupponen, Responsible teacher Amirsohrab Falsafi, Responsible teacher Oskari Sievinen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: Upon completion of the course the student is expected to be able to
1. list the most important sustainability challenges posed by production and communities,
2. name the most typical ways of controlling sustainability challenges,
3. use environmental engineering terminology,
4. write a seminar report, act as an opponent, and give a poster presentation at the seminar,
5. apply system analytical and life cycle thinking, and
6. explain how other technology fields are connected to environmental engineering.

Content

EN: Sustainability challenges at different spatial scales, related e.g. to production, consumption, solid waste, water use, air quality, energy transition, food systems, household consumption and the built environment. Technical solutions and steering mechanisms for the management of the sustainability challenges. The course also introduces life cycle thinking.

Use of AI applications

AI applications are not used in this course.

Additional information

EN: Blended learning
***
The course is related to UN's Sustainable Development Goals (SDG): 2 zero hunger, 6 clean water and sanitation, 7 affordable and clean energy, 9 industry, innovation and infrastructure, 11 sustainable cities and communities, 13 climate action

Study materials

EN: Moodle, lecture materials, additional reading related to lecture topics

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 1. period-2. period Recurrence 2: 3. period-4. period	6 cr
Course Completion		6 cr
Method 2	Recurrence 1: 1. period-4. period	6 cr
Course Completion		6 cr
Method 3	Recurrence 1: 1. period-4. period	6 cr
Course Completion		6 cr
Method 4	Recurrence 1: 1. period-4. period	6 cr
Course Completion		6 cr

BH60A6801 Sustainable.now

BH60A6801 Sustainable.now

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3-5 cr
Languages	English, Finnish
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Environmental Technology 100%
Responsible persons	Annukka Ilves, Administrative person Miika Marttila, Responsible teacher
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: After successfully completing the course, students:
1) Understand the intersectional, partly contradictory, goals and interdimensionality of the climate challenge and the challenges of sustainable development.

2) Are familiar with the multidisciplinary links between climate change and different goals of sustainable development, and will identify different tools for solving problems.

3) Outline the importance of positivity and solution orientation both through the global responsibility of individuals and through the transformation of existing structures.

Content

EN: Sustainable.now is a basic course for anyone interested in sustainable development and climate change. The principles of sustainable development will be linked to the 1.5 degree climate target.
- Ecological sustainability

- Social sustainability

- Economic sustainability

- Cultural sustainability

The course provides a solid knowledge package on the concept of sustainable development and its ecological, social, economic and cultural dimensions, as well as the connections and tensions between them. The ethical perspective that runs through the course provides a basis for considering sustainable development also as a political and normative concept. The course also emphasizes the importance of agency and the different roles of the individual. Students will be given the opportunity to look at the sustainability of their own lifestyle in terms of individual choices, but on the other hand, sustainability and climate challenges will also be presented as a structural and systemic problem.

Additional information

EN: The course is a part of Climate University – a multidisciplinary digital learning platform in sustainability challenges. The flexible study paths to the working life is a collaboration project of eleven Finnish universities.
The student can choose either 3 or 5 credits option upon the need.

The course is related to UN's Sustainable Development Goals (SDG):

1 no poverty

2 zero hunger

3 good health and well-being

4 quality education

5 gender equality

6 clean water and sanitation

7 affortable and clean energy

8 decent work and economic growth

9 industry, innovation and infrastucture

10 recuded inequalities

11 sustainable cities and communities

12 responsible consumption and production

13 climate action

14 life below water

15 life and land

16 peace, justice and strong institutions

17 partnership for the goals

Study materials

EN: Material and Literature specified in MOODLE course overview.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 2. period, 4. period	6 cr
Course Completion in English		3 cr
Course completion in Finnish		3 cr
Method 2	Recurrence 1: 2. period, 4. period	10 cr
Course completion in English		5 cr
Course completion in Finnish		5 cr
Method 3	Recurrence 1: 2. period, 4. period	3 cr
Course Completion in English		3 cr
Method 4	Recurrence 1: 2. period, 4. period	5 cr
Course completion in English		5 cr
Method 5	Recurrence 1: 2. period, 4. period	5 cr
Course completion in Finnish		5 cr
Method 6	Recurrence 1: 2. period, 4. period	3 cr
Course completion in Finnish		3 cr
Method 7		3 cr
Course Completion in English		3 cr
Method 8		3 cr
Course completion in Finnish		3 cr
Method 9		5 cr
Course completion in English		5 cr
Method 10		5 cr
Course completion in Finnish		5 cr

BH60A6000 Basic Course in Life Cycle Assessment

BH60A6000 Basic Course in Life Cycle Assessment

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	4 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Environmental Technology 100%
Responsible persons	Annukka Ilves, Administrative person Sanni Väisänen, Responsible teacher
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: After successfully completing the course, students will be able to:

- Describe the potential application areas of Life Cycle Assessment (LCA).
- Complete a simple LCA study using specific methodological steps.
- Understand the guidelines of ISO standards.
- Use the specialized LCA software, LCA For Expert (GaBi), at a basic level.
- Explain the importance of assumptions in interpreting LCA results, using examples.

Content

EN: Application areas of LCA, use of ISO standards: goal and scope setting, inventory analysis, impact analysis, result interpretation. One guided exercise for software. LCA documentation. The course is related to sustainability.

Additional information

EN: ***The course is related to UN's Sustainable Development Goals (SDG):
6 Clean Water and Sanitation, 7 Affordable and Clean Energy, 9 Industry, Innovation and Infrastructure, 11 Sustainable Cities and Communities, 12 Responsible Consumption and Production, 13 Climate Action

Study materials

EN: ISO 14040, ISO 14044, other material informed in the first lecture.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period Recurrence 2: Summer	4 cr
Course Completion		4 cr

LES10A260 Technical Computing Software

LES10A260 Technical Computing Software

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	4 cr
Languages	English

Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LUT School of Energy Systems 100%
Responsible persons	Aleksi Mankonen, Responsible teacher Annukka Ilves, Administrative person Minna Loikkanen, Administrative person Juho Ratava, Responsible teacher Cassia Santos Nunes Almeida, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Recommended: Programming skills or a course in the basics of some programming language.

Recommended prerequisites

LES10A210 Engineering Mathematics II

CT60A0250 Fundamentals of Programming for international programs

Learning outcomes

EN: After the course, the student is an elementary-level user of some computational development environment and is familiar with finding its documentation and implementing numerical methods using the development environment. The student has been introduced to software engineering and can define and solve simple computational problems using the development environment or a spreadsheet program. The students can use and produce technical information and assess information produced by themselves and others. The student may be introduced to use of AI tools in problem-solving and writing assistance.

Content

EN: The course introduces the student to basics of Matlab: Interface of the integrated development environment (IDE), conditional structures, array structures, plotting curves and surfaces, loop structures. In addition, Simulink and a spreadsheet program is used for problem-solving. Basic applications in numerical analysis, such as root finding, optimization and solving simple differential equations, with examples for engineering. Documenting the development process and writing formulas using LaTeX.

Company cooperation

The course project may be done for a company.

Use of AI tools

AI tools can be used to assist in problem-solving and writing. As an optional topic, you may train your own AI to solve a simple problem.

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG): 4 quality education, 5 gender equality and 10 reduced inequalities

Study materials

EN: The course material is disseminated on Moodle. Optionally, the Matlab Academy courses "Matlab Onramp" and "Matlab Fundamentals" may be used to supplant the material.

Literature

Kreyszig, Erwin: Advanced Engineering Mathematics
Valentine, D.T.; Hahn, B.D.: Essential MATLAB for Engineers and Scientists

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	4 cr
Course Completion		4 cr

LES10A410 Engineering Project Work

LES10A410 Engineering Project Work

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5-10 cr
Languages	English, Finnish
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LUT School of Energy Systems 100%
Responsible persons	Michael Child, Responsible teacher Alex Rosu, Responsible teacher Annukka Ilves, Administrative person
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Compulsory prerequisites

BK10A6101 Technical Documentation and 3D Modeling

BK10A6300 Engineering Design

Learning outcomes

EN: After successfully completing the mandatory part of the course , students are able to:

- apply knowledge gained from earlier course work to practice
- improving time management, critical thinking and problem-solving skills
- collaborate effectively and systematically in a multicultural environment
- develop creative ideas and solutions to real-world problems
- planning and implementing a product development project as part of development team based on a written project plan.
- design and implement a product or service
- incorporate end-user or customer needs into product/service design
- give and receive feedback on the effectiveness of project activities
- making a connection between innovation, design, and production with the sustainable development goals (SDGs)

Additionally, depending on amount of optional credits:

- use tools and other resources to develop a prototype
- testing a prototype to come up with further development suggestions and to optimize the design of final product
- presenting a built prototype to a real audience of peers and invited corporate sponsors during the spring's JHC seminar at Lappeenranta campus or other event
- prepare supplementary plan for further development of the prototype while also reporting the main results related to the prototype development/testing

Content

EN: The course enhances experience in challenge based learning through a learning-by-doing approach. Students will be engaged in solving a specific real-world problem or answering a complex question related to one of the core areas of expertise (Electrical engineering, Energy technology, Mechanical engineering, Environmental Technology etc.). In the end, students will demonstrate new knowledge and skills by developing a useful product or service in cooperation with possible corporate sponsors and presenting it to a real audience.
Students will receive extended instruction on the nature of challenge based learning, and then apply this knowledge to the project work. First steps will involve defining the question, problem or challenge that will serve as the basis of the project work. This will be followed by the design of a prototype product or service (and based on achievable additional credits, the construction phase of the prototype will also be involved). Throughout the project work, students will give, receive and use feedback to further improve their process and prototypes. Possible corporate sponsors may also provide feedback throughout the project. After refinement, the designed product/service and possible prototype will be explained, displayed, and presented to peers and possible corporate sponsors.

Additional information

EN: Blended learning
***

Students can participate in their group's project work on both campuses (Lappeenranta/Lahti)

***

It is possible to achieve a total of 10 credits in the course:

- mandatory 5 ECTS are gained during periods 1-2
- additional/optional 5 ECTS can be gained during periods 3-4

***

The course is related to the UN's Sustainable Development Goals (SDG), depending on the project chosen:

1) no poverty

2) zero hunger

3) good health and well-being

4) quality education

5) gender equality

6) clean water and sanitation

7) affordable and clean energy

8) decent work and economic growth

9) industry, innovation and infrastructure

10) reduced inequalities

11) sustainable cities and communities

12) responsible consumption and production

13) climate action

14) life below water

15) life and land

16) peace, justice and strong institutions

17) partnership for the goals

Study materials

EN:

- Material available in Moodle
- J. Michael Bennett, Project Management For Engineers, World Scientific Publishing Co Pte Ltd, 2014, ISBN 978981322485
- Pahl G. ; Beitz W., 1996. Engineering Design: A Systematic Approach, London, Springer. 543 s.
- Ulrich K.T. ; Eppinger S.D. 2000. Product Design and Development. New York, Irwin McGraw-Hill. 358 s.
- Virkkala V., 1994. Luova ongelmanratkaisu. Helsinki. 292 s.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 1. period-4. period	5-10 cr
Course Completion		5-10 cr

BK10A6300 Engineering Design

BK10A6300 Engineering Design

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Mechanical Engineering 100%
Responsible persons	Annukka Ilves, Administrative person Changyang Li, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: BK10A5800 Engineering Mechanics 1 (or equivalent);
BK10A6000 Engineering Mechanics 2 (or equivalent);

BK10A6101 Technical Documentation and 3D Modeling (or equivalent).

Equivalences to other studies

BK65A0203 Engineering Design

Learning outcomes

EN: After successfully completing the course, students are able to:

- work in a constructive and systematic way as part of a product development;
- apply creative ideation in the product development process;
- compare and apply the methodologies of product planning;
- select the suitable and necessary machine elements for the product;
- explain the interactions of basic machine elements.

Content

EN: The content of the course includes:

- Fundamentals of a systematic product planning and systematic machine design process, including idea generation, conceptual design, embodiment design, details design, manufacturing, etc;
- Knowledge of different machine elements, including gears, bearing, key, shaft, coupling, fasteners, etc.
- Knowledge about reverse engineering, design for manufacturing and assembly, etc...

Additional information

EN: Blended learning
The course is not suitable for the 1st year LUT students. The 1st year LUT students will be removed by teacher in the first week. If there is question about your qualification of attending the course, please send email to the teacher.

Artificial intelligent tool is allowed to be used in this course to collect information, it is forbidden for writing purpose.

The course is related to UN's Sustainable Development Goals (SDG): 9 industry, innovation and infrastructure

Study materials

EN: The study materials include:

- Lecture materials;
- Michael B. Spektor, 2018, Machine Design Elements and Assemblies.

Literature

Michael B. Spektor, 2018, Machine Design Elements and Assemblies.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	3 cr
Course Completion		3 cr
Method 2	Recurrence 1: 3. period-4. period	3 cr
Course Completion		3 cr

CT60A4304 Basics of database systems

CT60A4304 Basics of database systems

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Software Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Jiri Musto, Responsible teacher Iflaah Salman, Responsible teacher
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs)

Prerequisites

EN: Introduction to Programming or equivalent.

Recommended prerequisites

CT60A0203 Fundamentals of Programming

or

CT60A0250 Fundamentals of Programming for international programs

Equivalences to other studies

CT60A4350 Basics of Database Systems (Lahti)

Learning outcomes

EN: At the end of the course the student will be able to:
1.Design and model relational databases

2.Understand how the evolution of relational algebra led to SQL databases

3.Model real world problems with ER and transform the ER model to relational databases

4.Understand and solve issues related to relational database design, such as optimization and normalization

5.Implement relational databases in practice and embed them in applications

Content

EN: Database systems. Database design. Object-centric modeling and ER-modeling. Specifying relational models. SQL and object languages.
Perspectives into database design: How database is designed, how data is modeled, and what are data storage structures and access methods.

Transforming ER models to relational models, and then to relational databases. Basics to database programming: queries and other operations, database management, such as triggers. Implementing databases in practice and how to use SQL databases from other programs.

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG):
9 industry, innovation and infrastructure

Study materials

EN: Beynon-Davies, P.: Database Systems, Palgrave Macmillan, Third Edition, 2004. Foster, Elvis, C.: Database Systems A Pragmatic Approach, Apress, 2014. Lecture notes and other material assigned at the course. Coronel, C., & Morris, S. (2019). Database Systems: Design, Implementation and Management (13th ed.). Cengage Learning.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period	3 cr
Course Completion		3 cr
Method 2	Recurrence 1: 3. period	3 cr
Course Completion		3 cr

CT60A7650 Database Systems Management

CT60A7650 Database Systems Management

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Software Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Jiri Musto, Responsible teacher Iflaah Salman, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs)

Prerequisites

EN: Basics of database systemsObject-oriented programming

Compulsory prerequisites

CT60A4304 Basics of database systems

Equivalences to other studies

CT60A7660 Database Systems Management (Lahti)

Learning outcomes

EN: At the end of the course students will be able to

1. Create a relational model and a relational database
2. Understand relational algebra and relational calculus
3. Design a database application, data distribution, and architectures for data storage, retrieval, and administration of a database management system
4. Apply scalability, performance, security, and authorization
5. Demonstrate the knowledge of concepts and principles underlying the functioning of database management systems and maintenance.

Content

EN: Relational model and relational database design. Database applications, data distribution and architectures. Data storage and retrieval, data scalability, performance, security, authorization. Modeling and programing for semi-structured data, secondary storage management.

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG):
9 industry, innovation and infrastructure

Study materials

EN: Ramez Elmasri, Shamkant B. Navathe (2015), Fundamentals of Database Systems, 7th Edition, Published by Pearson. ISBN-13: 978-0-13-397077-7A. Hector Garcia-Molina, Jeffrey D. Ullman and Jennifer Widom: Database Systems : The Complete Book, Pearson Prentice Hall 2nd Edition, 2009
Coronel, C., & Morris, S. (2019). Database Systems: Design, Implementation and Management (13th ed.). Cengage Learning.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 4. period	3 cr
Course Completion		3 cr

CT60A5532 Software Project Management

CT60A5532 Software Project Management

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Software Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Micheal Tuape, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs)

Prerequisites

EN: CT60A4002 Ohjelmistotuotanto (Software Engineering).

Equivalences to other studies

LM10A1000 Project Management

or

CT60A5550 Software Project Management (Lahti)

Learning outcomes

EN: At the end of the course students will be able to

1. Demonstrate knowledge of key Project Management concepts and terminology
2. Develop a project plan for the development of a commonly used software
3. Demonstrate knowledge of tools and techniques for monitoring quality control of IT projects
4. Understand the importance of defining and anticipating potential risks
5. Describe how to communicate project progress to all stakeholders
6. Explain the roles and duties and responsibilities of software project managers
7. Explain how to manage and staff software project teams
8. Describe how to manage stakeholder expectations
9. Identify issues that could lead to software project success or failure

Content

EN: The Software Project Management course introduces the fundamentals of project management, beginning with project definition through the post-project review. There will be an emphasis placed on applying project management concepts and techniques to software development projects. The following topics will be covered in the course:

1. Introduction to Software Project Management
2. Project Methodologies and Processes
3. Measurable Organizational Value and the Business Case
4. Project Managers, Teams, and Stakeholders
5. Project Scope, Structure, and Scheduling
6. Project Infrastructure, Resources, and Costs
7. Managing Project Quality

8. Managing Project Risks
9. Project Execution, Completion, and Control

Additional information

EN: 3 ECTS cr course implementation for the students in Lahti campus, 6 ECTS cr course implementation for the students in Lappeenranta campus. Note mode of study is blended learning, not full-digi (changed 16.8.2022).

Study materials

EN: To be announced in Moodle

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Completion (Lappeenranta)		6 cr
Method 2	Recurrence 1: 3. period-4. period	6 cr
Course Completion (Lappeenranta)		6 cr

CT70A9111 Software Development Skills: Front-End

CT70A9111 Software Development Skills: Front-End

Abbreviation: CT00CM00

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	1 cr
Languages	English
Grading scale	Pass-Fail
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Software Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Erno Vanhala, Responsible teacher
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs)

Prerequisites

EN: CT30A2803 User Interfaces and Usability
CT60A0203 Introduction to Programming (or equivalent)

Compulsory prerequisites

CT30A2804 User Interfaces and Usability

CT60A0203 Fundamentals of Programming

Learning outcomes

EN: 1. Develop practical skills for software development
2. Learn the best practices and approaches of software development

3. Develop the skilled expected in industry to work as a software developer.

Content

EN: This course aims give students a chance to create unique projects with a hands-on approach.

The course guides students to find their interest in software engineering skills and to help each student find their desired path in software developing in the future. There are also several other Software Development Skill courses available on different topics.

The goal in this course is to make a responsive webpage using html, CSS and a little JavaScript. These are the basic tools to make today's web-frontend. Students may use Bootstrap or animations in addition. The project focuses only on the layout, styles and the overall structure of the page.

Course is 100% online self-study.

Additional information

EN: ***

The course is related to UN's Sustainable Development Goals (SDG):9 industry, innovation and infrastructure, 10 reduced inequalities

Study materials

EN: Available online (Moodle)

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 1. period-Summer	1 cr
¤LAB/LUT: Course Completion		1 cr

CT70A9120 Software Development Skills: Mobile

CT70A9120 Software Development Skills: Mobile

Abbreviation: CT00CM02

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	Pass-Fail
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Software Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Erno Vanhala, Responsible teacher
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs)

Prerequisites

EN: CT30A2803 User Interfaces and Usability
CT60A0203 Introduction to Programming (or equivalent)

Compulsory prerequisites

CT30A2804 User Interfaces and Usability

CT60A0203 Fundamentals of Programming

Learning outcomes

EN: 1. Develop practical skills for software development
2. Learn the best practices and approaches of software development

3. Develop the skilled expected in industry to work as a software developer.

Content

EN: This course aims give students a chance to create unique projects with a hands-on approach.
The course guides students to find their interest in software engineering skills and to help each student find their desired path in software developing in the future. There are also several other Software Development Skill courses available on different topics.

The goal in this course is to make an Android app with Android Studio. The app should have basic functionality with buttons and views. This course aims to teach the basics of mobile development.

Course is 100% online self-study.

Additional information

EN:
***

The course is related to UN's Sustainable Development Goals (SDG):9 industry, innovation and infrastructure, 10 reduced inequalities

Study materials

EN: Available online (Moodle)

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 1. period-Summer	3 cr
¤LAB/LUT: Course Completion		3 cr

CT70A9140 Software Development Skills: Full-Stack

CT70A9140 Software Development Skills: Full-Stack

Abbreviation: CT00CM01

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	Pass-Fail
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Software Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Erno Vanhala, Responsible teacher
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs)

Prerequisites

EN: CT30A2803 User Interfaces and Usability
CT60A0203 Introduction to Programming

CT60A2411 Object-Oriented Programming

CT60A4304 Basics of Database Systems
(or equivalent)

Compulsory prerequisites

CT30A2804 User Interfaces and Usability

CT60A0203 Fundamentals of Programming

CT60A2412 Object-Oriented Programming

CT60A4304 Basics of database systems

Learning outcomes

EN: 1. Develop practical skills for software development
2. Learn the best practices and approaches of software development

3. Develop the skilled expected in industry to work as a software developer.

Content

EN: This course aims give students a chance to create unique projects with a hands-on approach.

The course guides students to find their interest in software engineering skills and to help each student find their desired path in software developing in the future. There are also several other Software Development Skill courses available on different topics.

The course gives the student basic understanding of full-stack development. The goal is to create a basic front- and back-end and bundle them together as a complete system.

The focus is to understand the bigger picture and how to bundle different software components together to create a working program. You will learn how to use MEAN-stack as a full stack tool bundle to create an app from scratch.

Course is 100% online self-study.

Additional information

EN: ***

The course is related to UN's Sustainable Development Goals (SDG):9 industry, innovation and infrastructure, 10 reduced inequalities

Study materials

EN: Available online (Moodle)

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 1. period-Summer	3 cr
¤LAB/LUT: Course Completion		3 cr

CT10A7052 Software Engineering work practise

CT10A7052 Software Engineering work practise

Curriculum period	2025-2026
Validity period	since 1 Aug 2025

Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Software Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Ari Happonen, Responsible teacher
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs)

Prerequisites

EN: It is highly recommended, that the participating student has already collected around 90 ECTS or more study points, before participating into this course.

Learning outcomes

EN: Students will learn about current trends and realities related to the software engineering jobs, work activities young recruits typically become in contact in first few years and how digitalization and digital transformation of worklife might change academic and private organization near future careers and expectations put on students skills, when selected onf first study area related jobs.
Course assignments are designed to give a glimpse into the current work-life skill set expectations, connected to the yearly changing context, based on lectures given by industry and university visiting lecturers. The course e.g. connects work life RDI activities on software level and how that affects our everyday life and how students should prepare to future work-life.

After completing the course student will be able to:
1. utilize the course knowledge into real life cases
2. explain more clear sense on future work-life skill set expectations including lifelong learning
3. evaluate own believes of work-life expectations into presented ones
4. apply orally given experts know-how into another use case context
5. evaluate different software engineering career paths compared to own skill set, knowledge base and motivation areas

Content

EN: The course is based on a series of visiting lectures given by the researchers / professors from LUT and lectures given by yearly changing industry and public sector experts and company representatives. The lectures introduce students to research, industry work practices / expectations towards students knowledge base on work practices e.g. when applying and working in junior positions. Most lectures are connected to course tasks related to the lecture context (e.g. research / skill building task on industry area of the visiting lecturer or reflecting a topic specific research article, small ICT jobs related problem solving task etc.). All tasks are evaluated, and tasks can also include follow up discussions in the lectures. Some lectures may include e.g. live demonstrations of tools used in industry, like data-analysis, software testing/development and UI modeling tools. Within the lectures, students shall learn details from software engineering positions related daily work practices, receive software engineering career path building guideline points and have access to ask direct questions from the visiting lecturers. Visiting lectures may explain the insight on how to achieve a specific career goals (e.g. project/product manager positions) or practical view from school to funder of your own startup and working as ICT field CEO.

Additional information

EN: Note! Course replaces CT10A7051 Area Expert's Views on Future Work-life Expectations and can not be included in the same degree.
The tasks evaluated in the course are connected to the lectures given by the teacher in charge and the visiting lecture(s). Students should take this into account as previous years tasks are considered case by case, will the be accepted in follow up teaching years.

The course is related to UN's Sustainable Development Goals (SDG): 4 quality education, 5 gender equality, 8 decent work and economic growth, 9 industry, innovation and infrastructure, 10 reduced inequalities, 17 partnership for the goals

Study materials

EN: Self study on Jalali S., Wohlin C., Systematic Literature Studies: Database Searches vs. Backward Snowballing.
Other material shall be given and presented in the course lectures. In addition, some needed support material for course tasks can be given within the release of the tasks.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	3 cr
Course Completion		3 cr
Method 2	Recurrence 1: 3. period-4. period	3 cr
Course Completion		3 cr

CT70A9150 Introduction to DevOps

CT70A9150 Introduction to DevOps

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	Pass-Fail
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Software Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Erno Vanhala, Responsible teacher
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs)

Prerequisites

EN: Basics of Linux (or equivalent knowledge),CT60A0203 Introduction to Programming

Recommended prerequisites

CT30A3232 Basics of Linux

CT60A0203 Fundamentals of Programming

Learning outcomes

EN: At the end of the course the student will be able to:
1. Design and implement repositories for software engineering projects

2. Understand how the evolution of development practices led to DVCS and DevOps

3. Understand and solve issues related to versioning and deployment

4. Set up continuous deployment pipeline

5. Implement testing and other deployment processes as a part of a DevOps process

Content

EN: Distributed version control systems (DVCS). Modern repository hosting platforms, such as GitHub and GitLab. Repository best practices, management, and administration. Solving repository errors. Continuous deployment processes and executing tests. Basics of container platforms, such as Docker. Deploying basic applications from source control systems.

Additional information

EN: ***
The course is related to UN's Sustainable Development Goals (SDG):9 industry, innovation and infrastructure, 10 reduced inequalities

Study materials

EN: Tutorial videos, online readings, and other material assigned at the course.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period, 1. period-2. period, 4. period-Summer, Summer	3 cr
Course Completion		3 cr

VT10A1400 Environmental Communication

VT10A1400 Environmental Communication

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Social Sciences 100%
Responsible persons	Tarja Pettinen, Administrative person Iina Hellsten, Responsible teacher
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Social sciences

Learning outcomes

EN: After completing the course, the students:
Can describe the main theoretical strands of environmental communication

Have acquired skills to communicate about environmental issues

Content

EN: The course focuses on the main strands of environmental communication covering environmental risks such as ozone hole depletion, biodiversity loss, and climate change as well as the main measures to counter environmental risks. The course consists of hybrid teaching with recorded lectures, on-campus lectures and online exercises.

Additional information

EN: ***
The course is related to the UN Sustainable Development Goals (SDG): Not relevant

Study materials

EN: Course literature is to be announced in the beginning of the course.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 1. period	5 cr

	Recurrence 2: 3. period	
Course Completion		5 cr

VT10A1500 Political Communication, Social Movements and Activism

VT10A1500 Political Communication, Social Movements and Activism

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Social Sciences 100%
Responsible persons	Tarja Pettinen, Administrative person Kaisa Pekkala, Responsible teacher
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Social sciences

Learning outcomes

EN: After completing the course, the student will:
· Understand the role of political communication, social movements, and activism in society.

·Understand the key concepts and research directions in political communication and social movement research.

·Be able to identify and examine current phenomena in the field

Content

EN: The course focuses on how societal influence is exercised through communication. It examines political communication and its key concepts and theories. Students will also explore social movements and activism as forms of influence. The course will look at current phenomena in political communication and the role of social movements and activism in contemporary society.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 2. period Recurrence 2: 4. period	5 cr
Course Completion		5 cr

BK10A4101 Modern Management and Leadership in Engineering

BK10A4101 Modern Management and Leadership in Engineering

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LES, Mechanical Engineering 100%

Responsible persons	Tapio Saarelainen, Responsible teacher Annukka Ilves, Administrative person
Study level	Advanced studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: B.Sc. in mechanical engineering

Equivalences to other studies

BK10A4100 Management and Leadership Skills in Mechanical Engineering

Learning outcomes

EN: After having passed this course the students will be able to:
- apply problem-solving and decision-making skills in management and leadership

- identify the differences between information management and knowledge management and understand the basic viewpoints to take care of the practical actions needed

- compare the challenges and possibilities related to different social media channels and utilize them in leadership and management

- recognize different leadership styles and compare their strengths and weaknesses in different types of leadership environments (coaching, visionary, servant, autocratic, Laissez-faire or hands-off, democratic or participative, pacesetter, transformational, transactional and bureaucratic leadership).

- apply the principles of equality to handle the leadership and management issues related to different cultural backgrounds

- apply the principles of leadership in line and matrix organizations

- identify the differences between information change management and. change leadership and understand the actions which are needed to take care of the practical situations

- to take care of leadership and management activities in digital networking environments for engineering

- recognize and handle stress including the right actions in stressful situations in different leadership and management positions, signs of stress and ways to relief the recognized stress

- recognize and utilize the future trends of modern leadership and management in engineering

Content

EN: The content of the course consists of nine main themes as follows:
1. Differences between information management and knowledge management.

2. Social media and leadership and management: challenges and possibilities related to different social media channels.

3. Leadership vs. management including the following issues: different leadership styles (coaching, visionary, servant, autocratic, Laissez-faire or hands-off, democratic or participative, pacesetter, transformational, transactional and bureaucratic leadership).

4. Principles for understanding different cultural backgrounds.

5. Leadership in line and matrix organizations.

6. Change management vs. change leadership.

7. Leadership and management in digital networking environments in engineering.

8. How to recognize and handle stress including the following issues: Stressful situations in different leadership and management positions, signs of stress, ways to relief the recognized stress.

9. The future trends of modern leadership and management in engineering.

10. Innovation leadership and innovation management.

11. Company cooperation

- Apply problem-solving and decision-making skills in management and leadership, enhancing employability in various industries.
- Recognize and utilize the future trends of modern leadership and management in engineering, increasing the chances of securing a permanent job in the industry.

12. Use of AI applications

- Utilize AI-driven tools to enhance problem-solving and decision-making skills in management and leadership, thereby improving employability in various industries.
- Apply AI technologies to analyze and predict future trends in modern leadership and management, increasing the chances of securing a permanent job in the industry.

Study materials

EN: Thomas R. Krause, John L. Henshaw; Leading with Safety, John Wiley Sons Inc., ISBN: 9780471494256
Michael G. Rumsey, The Oxford Handbook of Leadership, Oxford Library of Psychology, Oxford University Press Inc., 2012, ISBN: 9780195398793

David J. Jones, Ronald J. Recardo, Leading and Implementing Business Change Management, Routledge, 2013, ISBN: 9780415660617

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period	5 cr
Course Registration (Mechanical Engineering ja Materials Science, Lappeenranta)		0 cr
Course Assessment (Mechanical Engineering ja Materials Science, Lappeenranta)		5 cr
Method 2	Recurrence 1: 3. period	5 cr
Course Registration (IDE ja Mechatronics, Lahti)		0 cr
Course Assessment (IDE ja Mechatronics, Lahti)		5 cr
Method 3	Recurrence 1: 3. period	5 cr
Course Registration (JEDI)		0 cr
Course Assessment (JEDI), 5 cr		5 cr

CS39A0030 Entrepreneurship and SMEs

CS39A0030 Entrepreneurship and SMEs

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	Pass-Fail
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Industrial Engineering and Management 100%
Responsible persons	Anu Raappana, Responsible teacher Armi Rissanen, Administrative person Noora Heino, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: The aim is that after completing the course, the student recognizes the importance of entrepreneurship from a business perspective, as well as the social dimensions of entrepreneurship and small business, and is able to distinguish between the concepts of entrepreneur and entrepreneurship. In addition, after completing the course student is familiar with the characteristics of small business and the process of business formation.

Content

EN: The course familiarize students with the concepts of entrepreneurship and small business. The aim of the course is to enhance of students' understanding in the importance of entrepreneurship and small business for economies.

Additional information

EN: Online course. For the students of BSc in IEM.

Study materials

EN: Course book and materials distributed in Moodle.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr
Method 2	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr

CS39A0060 B2B Marketing in industrial context

CS39A0060 B2B Marketing in industrial context

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Industrial Engineering and Management 100%
Responsible persons	Armi Rissanen, Administrative person Jussi Heikkilä, Responsible teacher Tero Rantala, Responsible teacher
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: Upon the successful completion of this course, students should be able to

- Describe the key characteristics and marketing approaches in B2B and B2C (Business-to-Consumer) contexts.
- Demonstrate understanding of the concepts and applications of business marketing.
- Apply the marketing mix tools and critically assess strategic marketing choices and positionings of industrial companies.
- Apply the theoretical knowledge to understand and analyze the ongoing digital transformation challenges and green transformation in the industrial B2B marketing context.

Content

EN: The lectures cover a range of topics concerning business marketing, including organizational buying behavior; market research; segmentation, targeting and positioning; strategic planning of marketing; market entry tactics and pricing; product strategy and product development; digitalization and services for business markets; managing business marketing channels; business to business marketing communications; future of business marketing.
The course integrates theory and practice to foster active involvement and self-reflection and aid students in preparing for professional practice.

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG): 9 industry, innovation and infrastructure, 12 responsible consumption and production

If a student of Industrial Engineering and Management has already completed *A130A0010 Markkinoinnin perusteet (6 cr)* this is a compensatory course for *CS39A0060 B2B Marketing in industrial context (6 cr).* It's not allowed to include both of those courses to student's personal study plan (PSP).

Study materials

EN: Will be announced on the Moodle pages of the course.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr
Method 2	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr

CS39A0040 Product and Service Development

CS39A0040 Product and Service Development

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Industrial Engineering and Management 100%
Responsible persons	Ilkka Donoghue, Responsible teacher Armi Rissanen, Administrative person Mira Timperi, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Prerequisites

EN: Not required

Learning outcomes

EN: The student can apply the following concepts:
- Product and service development processes and methodologies (waterfall, agile)

- understand the product, service, solution development frameworks

- Product & Service Configuration Management & Change Management

- System Engineering basics

- Product and service definition views (Technical, business, delivery, marketing, legal, QEHS)

- Development IT solutions used in extended the organisations

- Understand the product & service development role in the Product Lifecycle Management contexts.

Content

EN: Product-Service Systems types in B2B and C2B
Product and service development processes and tools

Product and service development and role place in PLM

Product and service definition and it different view points

Different types of approaches to product/service development (e.g. SysEng)

Additional information

EN: This course is aimed for the students of Bachelor's Degree level.

Study materials

EN: Lecture materials, articles and parts of relevant books

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr
Method 2	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr

CS39A0090 Networks and ecosystems

CS39A0090 Networks and ecosystems

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Industrial Engineering and Management 100%
Responsible persons	Satu Rinkinen, Responsible teacher Armi Rissanen, Administrative person
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: After completing the course the student understands the role of social and inter-firm networks in business and innovation activities. After the course the student is able to analyze and describe an organization's role in ecosystems, and to utilize the ecosystem-based view when planning and developing business and innovation activities.

Content

EN: The core content of the course includes:
- Networks as social and economic organization

- Network-based view on business and innovation

- Business and innovation ecosystem characteristics

- Ecosystems as affiliation and as a structure

- Ecosystem evolution

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG): 9 industry, innovation and infrastructure

Study materials

EN: Lecture slides, and articles and videos informed and provided on the course's Moodle page.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Registration		0 cr
Course Assessment		6 cr

CS39A0020 Basics of innovation management

CS39A0020 Basics of innovation management

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	6 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Industrial Engineering and Management 100%
Responsible persons	Mirva Hyypiä, Responsible teacher Armi Rissanen, Administrative person
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction

Learning outcomes

EN: - Elements of Innovation management
- Understanding the innovation processes

- Identifying different types of innovation

- Creativity in the innovation activities

Additional information

EN: Will be provided first time in the academic year 2023-24. For the students of BSc IEM (Lahti) programme.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	6 cr
Course Completion		6 cr

CT60A4350 Basics of Database Systems (Lahti)

CT60A4350 Basics of Database Systems (Lahti)

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Software Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Iflaah Salman, Responsible teacher
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs)

Prerequisites

EN: Introduction to Programming or equivalent.

Compulsory prerequisites

CT60A0203 Fundamentals of Programming

or

CT60A0250 Fundamentals of Programming for international programs

Equivalences to other studies

CT60A4304 Basics of database systems

Learning outcomes

EN: At the end of the course the student will be able to:
1. Design and model relational databases

2. Understand how the evolution of relational algebra led to SQL databases

3. Model real world problems with ER and transform the ER models to relational databases

4. Understand and solve issues related to relational database design, such as optimization and normalization

5. Implement relational databases in practice and embed them in applications

Content

EN: Database systems. Database design. Object-centric modeling and ER-modeling. Specifying relational models. SQL and object languages.
Perspectives into database design: How database is designed, how data is modeled, and what are data storage structures and access methods.

Transforming ER models to relational models, and then to relational databases. Basics to database programming: queries and other operations, database management, such as triggers. Implementing databases in practice and how to use SQL databases from other programs.

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG):
9 industry, innovation and infrastructure

Study materials

EN: Beynon-Davies, P.: Database Systems, Palgrave Macmillan, Third Edition, 2004. Foster, Elvis, C.: Database Systems A Pragmatic Approach, Apress, 2014. Lecture notes and other material assigned at the course. Coronel, C., & Morris, S. (2019). Database Systems: Design, Implementation and Management (13th ed.). Cengage Learning.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period	3 cr
Course Completion		3 cr

CT60A7660 Database Systems Management (Lahti)

CT60A7660 Database Systems Management (Lahti)

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Software Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Iflaah Salman, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs)

Prerequisites

EN: SQL database knowledge is recommended.

Compulsory prerequisites

CT60A4304 Basics of database systems

Equivalences to other studies

CT60A7650 Database Systems Management

Learning outcomes

EN: At the end of the course students will be able to

1. Create a relational model and a relational database
2. Understand relational algebra and relational calculus
3. Design a database application, data distribution, and architectures for data storage, retrieval, and administration of a database management system
4. Apply scalability, performance, security, and authorization
5. Demonstrate the knowledge of concepts and principles underlying the functioning of database management systems and maintenance.

Content

EN: Relational model and relational database design. Database applications, data distribution and architectures. Data storage and retrieval, data scalability, performance, security, authorization. Modeling and programing for semi-structured data, secondary storage management.

Additional information

EN: The course is related to UN's Sustainable Development Goals (SDG):
9 industry, innovation and infrastructure

Study materials

EN: Ramez Elmasri, Shamkant B. Navathe (2015), Fundamentals of Database Systems, 7th Edition, Published by Pearson. ISBN-13: 978-0-13-397077-7A. Hector Garcia-Molina, Jeffrey D. Ullman and Jennifer Widom: Database Systems : The Complete Book, Pearson Prentice Hall 2nd Edition, 2009
Coronel, C., & Morris, S. (2019). Database Systems: Design, Implementation and Management (13th ed.). Cengage Learning.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 4. period	3 cr
Course Registration		3 cr

CT60A5550 Software Project Management (Lahti)

CT60A5550 Software Project Management (Lahti)

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LENS, Software Engineering 100%
Responsible persons	Jonna Naukkarinen, Administrative person Micheal Tuape, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs)

Prerequisites

EN: CT60A4002 Ohjelmistotuotanto (Software Engineering).

Equivalences to other studies

CT60A5531 Software Project Management

Learning outcomes

EN: At the end of the course students will be able to

1. Demonstrate knowledge of key Project Management concepts and terminology
2. Develop a project plan for the development of a commonly used software
3. Demonstrate knowledge of tools and techniques for monitoring quality control of IT projects
4. Understand the importance of defining and anticipating potential risks
5. Describe how to communicate project progress to all stakeholders
6. Explain the roles and duties and responsibilities of software project managers
7. Explain how to manage and staff software project teams
8. Describe how to manage stakeholder expectations

9. Identify issues that could lead to software project success or failure

Content

EN: The Software Project Management course introduces the fundamentals of project management, beginning with project definition through the post-project review. There will be an emphasis placed on applying project management concepts and techniques to software development projects. The following topics will be covered in the course:

1. Introduction to Software Project Management
2. Project Methodologies and Processes
3. Measurable Organizational Value and the Business Case
4. Project Managers, Teams, and Stakeholders
5. Project Scope, Structure, and Scheduling
6. Project Infrastructure, Resources, and Costs
7. Managing Project Quality
8. Managing Project Risks
9. Project Execution, Completion, and Control

Additional information

EN: Note mode of study is blended learning

Study materials

EN: To be announced in Moodle

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	3 cr
Course Completion		3 cr

VA10A1000 Basics of Management and Organisations

VA10A1000 Johtamisen ja organisaatioiden perusteet

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English, Finnish
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	Education other than LUT University 100%
Coordinating organisation	University of Vaasa 100%
Responsible persons	Suvi Tiainen, Administrative person
	⚠ [information missing], Responsible teacher
	⚠ [information missing], Responsible teacher
	⚠ [information missing], Responsible teacher
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Business, administration and law

Tweet text

EN: LITO course

Learning outcomes

EN: Upon successful completion of the course, the student will be able to:
· name the key concepts and theories in the areas of organisation, management and leadership

· name the key concepts and evaluate the functions of human resource management

· understand the major tools of strategic management

· understand business in the network of global interactions

· apply theory in practical leadership and management situations.

Content

EN:

- Management and leadership
- The development of leadership thinking and leadership theory
- The key concepts of management leading culture, innovation and change

- Organisations and organisational behaviour
- Organisational structure
- Organisational culture
- Organisational life
- Human resource management
- Human resource management
- Leading individuals, teams and groups
- Motivation and coaching
- Strategic thinking and strategic tools
- The development of strategic thinking and strategy
- Strategic tools
- Strategic management in a global environment

Additional information

EN: Note
Only for technology and social science students. The latest information about the course is updated and published on the course platform at www.lito.fi.

Please note that the completion of the course takes place on the DigiCampus learning platform. Login instructions to the platform will be provided to the students who have registered for the course via email.

Late enrollments are not accepted.

The LITO courses are organised in co-operation with multiple universities. To enable registering credits when the course is completed, it is necessary to transfer data about the student from their home university to the university that is responsible for organizing the course. The data to be transferred consists of: name, gender, nationality, e-mail address, personal identification number and the home university. Data that is classified as secret is not transferred. Without data transfer it is not possible to have the course credits registered.

The course will run from 2 February 2026 to 6 April 2026 (Weeks 6-15) + exam resits.

Study materials

EN: Robbins, Stephen P. – Judge, Timothy A. – Campbell, Timothy T. (2017) Organizational Behavior. **OR**
Robbins, Stephen P. – Judge, Timothy A. (2021) *Essentials of Organizational Behavior*. Global edition. Pearson.

The course instructors may ask students to read additional literature (e.g. articles). Details of additional readings are given at the beginning of the course.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	5 cr
Course Completion		5 cr

VA10A1100 Basics of Marketing and Sales

VA10A1100 Markkinoinnin ja myynnin perusteet

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English, Finnish
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	Education other than LUT University 100%
Coordinating organisation	University of Oulu 100%
Responsible persons	Suvi Tiainen, Administrative person
	⚠ [information missing], Responsible teacher
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Business, administration and law

Tweet text

EN: LITO course

Prerequisites

EN: The course includes a compulsory preliminary assignment that has to be completed successfully by a pre-defined date.

Learning outcomes

EN: Upon completion of the course, students will be able to:
· describe the role of marketing in an organisation and identify the significance of customer orientation in both the development of the organisation and personal actions

· apply the key concepts of marketing (e.g. customer-perceived value, the value creation process, the brand, the marketing mix and segmentation) in decision-making and evaluate decisions

· describe the diverse emphases of business-to-business marketing and consumer marketing, and the key characteristics of both logics

· identify and utilise key marketing communication channels in the fickle business environment

· understand sales processes in their entirety, the different parts of them in both consumer and business-to-business sales.

In addition to core marketing skills, the course develops working life skills, such as

· problem-solving and project management skills

· critical thinking / information assessment skills

· the analysis and application of information

· the utilisation digital platforms

· written and oral expression.

Content

EN: · Key marketing concepts, definitions and phenomena now and before
· Understanding these concepts in diverse contexts: The differences between consumer logic and business-to-business logic

· Customer-centred thinking and value creation

· Customer-oriented strategy in a changing business environment

· Key concepts and phenomena in consumer marketing

· Business-to-business marketing and organisational buying behaviour

· Marketing communication channels and content

· Sales processes in consumer and business-to-business contexts, as well as personal sales and interaction skills at different phases of sales processes

Additional information

EN: Only for students of technology and social sciences. The latest information about the course is updated and published on the course platform at www.lito.fi.
Please note that the completion of the course takes place on the DigiCampus learning platform. Login instructions to the platform will be provided via email to the students who have registered for the course.

The course will run from early March to early May 2026 (Weeks 10–19. There will be a pre-assignment in Week 9.

The LITO courses are organised in co-operation with multiple universities. To enable registering credits when the course is completed, it is necessary to transfer data about the student from their home university to the university that is responsible for organizing the course. The data to be transferred consists of: name, gender, nationality, e-mail address, personal identification number and the home university. Data that is classified as secret is not transferred. Without data transfer it is not possible to have the course credits registered.

Study materials

EN: The teachers will specify the literature at the beginning of the course.
The course material, literature and assignments are in English. However, students may submit their assignments either in Finnish or English.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 4. period	5 cr
Course Completion		5 cr

VA10A1400 Economics and the Business Environment

VA10A1400 Liiketoimintaympäristön taloustiede

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English, Finnish
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	Education other than LUT University 100%
Coordinating organisation	University of Jyväskylä 100%

Responsible persons	Suvi Tiainen, Administrative person ⚠ [information missing], Responsible teacher ⚠ [information missing], Responsible teacher
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Business, administration and law

Tweet text

EN: LITO-course

Prerequisites

EN: Preliminary assignment.

Learning outcomes

EN: Upon successful completion of the course, students will be able to:
· define basic economic concepts

· understand economic thinking and apply economic theory in the analysis of a business environment and market economies.

The course also develops problem-solving and analysing skills, and critical thinking, as well as developing the skills required to apply theoretical knowledge.

Content

EN: The course provides students with basic skills in analysing the business environment and provides an overview of its evolution from an economic perspective. Proactive identification of both opportunities in the business environment and threats to the business environment is increasingly important for successful businesses in the global economy.
During the course, the students will familiarise themselves with:

- the decision-making processes in companies and among consumers, and how the markets function (microeconomics)
- economic growth, business cycles, labour markets, inflation, monetary policy and economic policy (macroeconomics)
- the role of the public sector and the focal public policy instruments in market economies (public economics)
- international trade, financial markets, European integration and multinational companies (international economy).

Additional information

EN: Only for students of technology. The latest information about the course is updated and published on the course platform at www.lito.fi.
Late enrolments are not accepted.

Please note that the completion of the course takes place on the DigiCampus learning platform. Login instructions to the platform will be provided to the students who have registered for the course via email.

The course site opens in Week 9. The online course runs from 23 February to 5 April 2026 (Weeks 9–14). The exam can be taken between 13 April and 19 April 2026 (Week 16). Exam resits will be in Weeks 18 and 21.

Study materials

EN: The electronic coursebook is openly accessible in both English and in Finnish online:
The CORE Team: The Economy. Available at: http://www.core-econ.org.
CORE-työryhmä, Talous. Saatavilla sähköisesti: https://www.core-econ.org/project/core-talous/

The instructors may assign additional literature during the course.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 4. period	5 cr
Course Completion		5 cr

VA10A1600 Introduction to Corporate Social Responsibility

VA10A1600 Introduction to Corporate Social Responsibility

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	Education other than LUT University 100%
Coordinating organisation	Hanken School of Economics 100%
Responsible persons	⚠ [information missing], Responsible teacher Suvi Tiainen, Administrative person
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Business, administration and law

Tweet text

EN: LITO course

Learning outcomes

EN: Upon completion of the course, the students will be able to:
· define and apply key concepts and perspectives regarding CSR

· identify relevant issues and analyse the challenges related to corporate responsibility in selected industries

· describe the role of CSR in business and in relation to wider international political and economic issues

· describe the different aspects through which organizational practices can be CSR-oriented

· apply key concepts of CSR in their daily work.

In addition, the students will be able to analyse CSR literature, organise their work independently and work in a virtual environment.

Content

EN: · Central concepts in CSR
o CSR and sustainable development

o Definitions of CSR

o Why CSR matters – the business case

o Stakeholder salience

· Working with stakeholders

o Political CSR

o Cross-sector partnerships and CSR

o Multi-stakeholder initiatives and CSR

o CSR and human rights

· CSR in company operations

o Human resource management (HRM) and CSR

o CSR and supply chain

o CSR and sustainable consumption

o CSR – minimum wage and living wage

· Examples of CSR

o CSR and communication

o CSR and corruption

o CSR and leadership

o CSR and responsible investment

CSR and social entrepreneurship

Additional information

EN: Only for students of technology social sciences. The latest information about the course is updated and published on the course platform at www.lito.fi.
Please note that late enrollments are not accepted.

Preliminary schedule:

19.1. – 6.3.2025 (weeks 4–11)

Please note that the completion of the course takes place on the DigiCampus learning platform. Login instructions to the platform will be provided to the students who have registered for the course via email.

The LITO courses are organized in co-operation with multiple universities. To enable registering credits when the course is completed, it is necessary to transfer data about the student from their home university to the university that is responsible for organizing the course. The data to be transferred consists of: name, gender, nationality, e-mail address, personal identification number and the home university. Data that is classified as secret is not transferred. Without data transfer it is not possible to have the course credits registered.

Study materials

EN: The link to primary reading materials will be provided on the learning platform.

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 3. period-4. period	5 cr
Course Completion		5 cr

VA10A1700 Understanding and Managing a Business as a Dynamic Whole - Business Simulation Game

VA10A1700 Liiketoimintaosaamisen kokonaisdynamiikka ja sen ohjaaminen - yrityssimulaatio

Curriculum period	2025-2026
Validity period	since 1 Aug 2025

Credits	5 cr
Languages	English, Finnish
Grading scale	Pass-Fail
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	Education other than LUT University 100%
Coordinating organisation	University of Turku 100%
Responsible persons	Suvi Tiainen, Administrative person
	⚠ [information missing], Responsible teacher
Study level	Intermediate studies
Study field	Fields of education (Ministry of Education and Culture), Business, administration and law

Tweet text

EN: LITO course

Prerequisites

EN: The course serves as a capstone, bridging together the other modules in the LITO entity. The course provides an overall picture of business dynamics and explains how the different fields of business studies are related to it. Various tools and services outside the LITO learning platform may be used in the analyses during the course.
It is recommended that before taking this course, the student has taken at least the following LITO courses: 'Introduction to Accounting and Financial Management' and 'Basics of Management and Organisations'. Alternatively, the student must possess sufficient previous knowledge in these fields in order to be able to analyse a business as a whole.

Recommended prerequisites

VA10A1000 Basics of Management and Organisations

VA10A1200 Introduction to Accounting and Financial Management

Learning outcomes

EN: After completing the course, students will be able to:
· describe how different areas in business studies are connected in the entity of enterprise functions and in making a profit

· apply various methods of collaboration in a virtual team and to become aware of the key regularities in the collaborative business environment

· apply different business analysis tools in planning and managing a business and understand the essential role of strategy in the process.

A central part of the course is the optimisation of a business as a whole with respect to both various business functions and goals; students will understand why it is not practical to optimise single functions separately and why the management needs to have a holistic perspective of the company that simultaneously takes into account social, ecological and financial responsibility.

Content

EN: · The foundation for this course is a decentralised and collaborative business simulation exercise in which students work in teams and collaborate with other teams. Besides engaging in real-time decision-making during the simulation days, the students will complete assignments that relate to various business sciences and analyse the actions taken in the simulation outside the simulation days.
· Participation takes place in small virtual groups, the members of which come from different universities.

· The thematic core for the simulation is the entity formed by the different functions of a company and the responsible agency of the company in a network of enterprises. The relevant themes include several areas of cross-company functions (purchasing, project management, distribution and customer relationships) and the reporting related to these topics. The course emphasises the entity of business operations from the perspective of responsible management.

· During the course, students are introduced to the dynamics of business networks where the students' company is part of a network of competitors, suppliers and customers.

· The theoretical material and the exercises distributed on the course are related to the thematic core for the simulation and for other LITO learning themes.

Additional information

EN: The first course period runs from late September to late November 2026 (Weeks 40–47). There is a pre-assignment in Week 40.
The second course period runs from late January to mid March 2026 (Weeks 4–11). There is a pre-assignment in Week 4.

The third course period runs from mid March to mid May 2026 (Weeks 12–19). There is a pre-assignment in Week 12.

Please note that the completion of the course takes place on the DigiCampus learning platform. Login instructions to the platform will be provided via email.

The LITO courses are organised in co-operation with multiple universities. To enable registering credits when the course is completed, it is necessary to transfer data about the student from their home university to the university that is responsible for organizing the course. The data to be transferred consists of: name, gender, nationality, e-mail address, personal identification number and the home university. Data that is classified as secret is not transferred. Without data transfer it is not possible to have the course credits registered.

Study materials

EN: The literature includes: simulation game instructions, a description of the simulation environment, learning videos, a course hand-out and a selection of other articles (to be announced).

Completion method and assessment items	Recurrence	Credits
Method 1	Recurrence 1: 1. period-2. period Recurrence 2: 4. period, 3. period Recurrence 3: 4. period	5 cr
Course Completion		5 cr

K200CE69 Finnish 1

K200CE69 Finnish 1

Abbreviation: K200CE69

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	Finnish
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Sanna Paunonen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: The student is able to - identify and use the course vocabulary and phrases for common everyday situations - tell about oneself and understand basic questions - read and write simple sentences related to the course topics.

Additional information

EN:

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

K200CE70 Finnish 2

K200CE70 Finnish 2

Abbreviation: K200CE70

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	Finnish
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Sanna Paunonen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: The student is able to - communicate in most common everyday situations - understand slowly and clearly spoken Finnish when the topic and the vocabulary are familiar - understand and write a simple message or text - use the basic vocabulary and some grammatical structures of Finnish.

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

K200CH62 Finnish 3

K200CH62 Finnish 3

Abbreviation: K200CH62

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	Finnish
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Tarja Saarnisto, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

K200CH63 Finnish 4

K200CH63 Finnish 4

Abbreviation: K200CH63

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	Finnish
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Tarja Saarnisto, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

K200CL50 Finnish for Work 1

K200CL50 Finnish for Work 1

Abbreviation: K200CL50

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	Finnish
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Pirjo Rantonen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		5 cr
¤LAB/LUT: Course Completion		5 cr

K200CG35 Finnish for Work 2

K200CG35 Finnish for Work 2

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English, Finnish
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Pirjo Rantonen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		5 cr
¤LAB/LUT: Course Completion		5 cr

K200CU41 Suomi with Love 1

K200CU41 Suomi with Love 1

Abbreviation: K200CU41

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Sanna Paunonen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: The student is able to - identify and use the course vocabulary and phrases for common everyday situations - tell about oneself and understand basic questions - read and write simple sentences related to the course topics. Proficiency level: A1

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

K200CS72 Independent study in Finnish

K200CS72 Independent study in Finnish

Abbreviation: K200CS72

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	2 cr
Languages	English, Finnish
Grading scale	Pass-Fail

University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Sanna Paunonen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: Proficiency level B1 The students will be able to - read a text in his/her field in order to understand its main idea - use the most important Finnish concepts in his/her field both in speech and in simple texts - knows enough vocabulary in his/her field to be able to follow a lesson or lecture in Finnish and understand its main points - make use of tools to explain new concepts - can plan language learning independently and assess his/her own progress.

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		2 cr
¤LAB/LUT: Course Completion		2 cr

K200CQ88 Finnish Conversation 2

K200CQ88 Finnish Conversation 2

Abbreviation: K200CQ88

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	Finnish
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Tarja Saarnisto, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: The student is able to - tell about themselves, their interests, and express opinions on various topics - act in more versatile authentic spoken situations in Finnish - follow conversations, start them, and take part in maintaining them - understand and use various vocabulary and grammatical structures in speech. Proficiency level A2

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		5 cr
¤LAB/LUT: Course Completion		5 cr

K200CP87 Finnish Conversation 1

K200CP87 Finnish Conversation 1

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	Finnish
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Tarja Saarnisto, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KE00BZ84 English for Professional Development (Business)

KE00BZ84 English for Professional Development (Business)

Abbreviation: KE00BZ84

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	4 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Tessa Laba, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: Proficiency level: B2 Students are able to communicate clearly and effectively in different generic and field-specific work place situations both orally and in writing; find, evaluate and use information effectively and function collaboratively in international working environments.

Additional information

EN:

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		4 cr
¤LAB/LUT: Course Completion		4 cr

KE00BZ85 English for Professional Development (Technology)

KE00BZ85 English for Professional Development (Technology)

Abbreviation: KE00BZ85

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	4 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible persons	Hwei-Ming Boey, Responsible teacher Olesya Kullberg, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: Proficiency level: B2 Students are able to communicate clearly and effectively in different generic and field-specific work place situations both orally and in writing; find, evaluate and use information effectively and function collaboratively in international working environments

Additional information

EN:

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		4 cr
¤LAB/LUT: Course Completion		4 cr

KE00BZ83 English for Professional Development (ESTIEM)

KE00BZ83 English for Professional Development (ESTIEM)

Abbreviation: KE00BZ83

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	4 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Ritva Kosonen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: Proficiency level: B2 Students are able to communicate clearly and effectively in different generic and field-specific work place situations both orally and in writing; find, evaluate and use information effectively and function collaboratively in international working environments.

Additional information

EN:

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		4 cr
¤LAB/LUT: Course Completion		4 cr

KE00CG81 Business Writing

KE00CG81 Business Writing

Abbreviation: KE00CG81

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Tessa Laba, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: Proficiency level: B2 The student is able to: - interpret business transaction documents - use field-specific business terminology and style of writing - prepare clear and accurate business messages in correct English - prepare explicit and effective texts for use within and outside the organization, and to meet the communicative needs.

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KE00BZ81 Academic Writing

KE00BZ81 Academic Writing

Abbreviation: KE00BZ81

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	Pass-Fail
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Anneli Rinnevalli, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: Proficiency level: B2-C1 Students are able ·to identify the characteristics of academic writing ·to demonstrate their proficiency in applying academic writing conventions, both generic and discipline-specific, to their writing ·to demonstrate their ability to critical thinking and analysis ·to demonstrate ability in collaborative situations ·to produce a 6-page academic paper in pairs or in groups of three

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KE00CG33 Writing for Digital Media

KE00CG33 Writing for Digital Media

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	4 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Hamid Guedra, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		4 cr
¤LAB/LUT: Course Completion		4 cr

KE00CQ38 Introduction to Copywriting

KE00CQ38 Introduction to Copywriting

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	2 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Vesa Koskela, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		2 cr
¤LAB/LUT: Course Completion		2 cr

KE00CG79 Professional Reading

KE00CG79 Professional Reading

Abbreviation: KE00CG79

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Matti Mäkelä, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: Proficiency level: B2 Students are able to - comprehend, analyze and summarize authentic professional texts in English - learn and master strategies for expanding professional vocabulary - use strategies for effective reading.

Additional information

EN:

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KE00CG82 Online Presentations

KE00CG82 Online Presentations

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Riitta Gröhn, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KE00BX35 English Pronunciation

KE00BX35 English Pronunciation

Abbreviation: KE00BX35

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	1 cr
Languages	English
Grading scale	Pass-Fail
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Samu Lattu, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: Students understand various English dialects and know about their special features. Students are able to pronounce English clearly

Additional information

EN:

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		1 cr
¤LAB/LUT: Course Completion		1 cr

KE00CC64 English Prep Course

KE00CC64 English Prep Course

Curriculum period	2025-2026
Validity period	since 1 Aug 2025

Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible persons	Anneli Rinnevalli, Responsible teacher Sari Turppo, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Additional information

EN: Note. The course is not accepted in LUT university's degrees' compulsory language studies. It can however be included in free elective studies.

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KE00DG83 English and AI: Terminology, Ethics and Writing

KE00DG83 English and AI: Terminology, Ethics and Writing

Abbreviation: KE00DG83

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	1 cr
Languages	English
Grading scale	Pass-Fail
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Hamid Guedra, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Learning outcomes

EN: You are able to:

- define and use key terms of AI in English
- identify AI risks and key points of AI ethics in English
- use AI tools responsibly for professional writing in English

Completion method and assessment items	Recurrence	Credits
Method 1		1 cr

¤LAB/LUT: Course Completion 1 cr

KE00DB63 Copywriter´s Portfolio

KE00DB63 Copywriter´s Portfolio

Abbreviation: KE00DB63

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	2 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Vesa Koskela, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: The student is able to: · Write practical copy based on a professional brief · Apply copywriting practices learned previously · Produce a coherent and professional looking copywriter’s portfolio

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		2 cr
¤LAB/LUT: Course Completion		2 cr

KE00CX55 Responsible Communication

KE00CX55 Responsible Communication

Abbreviation: KE00CX55

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	1 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Sanna Kyyhkynen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: The student is able to · identify the role of communication in promoting social responsibility and sustainable development · critically analyze communication messages for ethical implications · apply responsible communication strategies for creating effective product descriptions.

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		1 cr
¤LAB/LUT: Course Completion		1 cr

KM00BX75 Each one teach one

KM00BX75 Each one teach one

Abbreviation: KM00BX75

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	Pass-Fail
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Tuija Marila, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: Proficiency level: any between A1-C2 Students learn a language of their choice together with a native speaker.

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KD00CH39 German 1

KD00CH39 Saksa 1

Abbreviation: KD00CH39

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	German
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Pirjo Rantonen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: The students will - understand slow and clear speech related to course topics - are able to communicate orally and in writing in simple everyday situations, such as introductions, telling about oneself and reacting e.g. in dining situations - are able to use the most frequent basic structures CEFR level A1

Additional information

EN:

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KD00CH40 German 2

KD00CH40 Saksa 2

Abbreviation: KD00CH40

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	German
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Pirjo Rantonen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: The students will - understand slow and clear speech related to course topics - are able to communicate orally and in writing in simple everyday situations, such as telling about the family, free time and health - are able to use the most frequent basic structures. CEFR level A1

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KD00CH41 German 3

KD00CH41 Saksa 3

Abbreviation: KD00CH41

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	German
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Pirjo Rantonen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: The students will - understand clear speech related to course topics - are able to communicate orally and in writing in simple everyday situations, such as telling about the home, work and past events - are able to use the most frequent basic structures CEFR level A1

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KD00CH43 German for Work 2

KD00CH43 Työelämän saksaa 2

Abbreviation: KD00CH43

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	German
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Tiina Pernanen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KD00CT54 German for Work 3

KD00CT54 Työelämän saksaa 3

Abbreviation: KD00CT54

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	German
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Pirjo Rantonen, Responsible teacher
Study level	Other studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: The student is able to communicate in oral interaction situations at the workplace related to e.g. company visits. The student is able to compose work-related emails. The student knows the key features of German working life.

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KD00CZ29 Spoken German Skills

KD00CZ29 Saksan suullinen kielitaito

Abbreviation: KD00CZ29

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	German
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Pirjo Rantonen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: Proficiency level A2 The students will - be able to tell about concrete topics - be able to react fairly spontaneously in a conversation and request clarification - be able to express their opinion - improve their pronunciation.

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KF00CH30 French 1

KF00CH30 Ranska 1

Abbreviation: KF00CH30

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	French
Grading scale	General scale, 0-5

University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Sari Pärssinen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: After completing the course, the student - is able to use the basic structures and vocabulary necessary for work and study life introductory situations - can present oneself and tell about oneself orally and in writing. - knows the basic rules of pronunciation - knows the basic differences between formal and informal communication - is able to ask questions and express preferences. - knows the basic structures: verbs' present tense, articles, prepositions of place, prepositions à ja de, personal pronouns, structure expressing ownership, prohibition, questions, numbers 0-69. Proficiency level: A1

Additional information

EN:

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KF00CH31 French 2

KF00CH31 Ranska 2

Abbreviation: KF00CH31

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	French
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Sari Pärssinen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: After completing the course, the student - is able to use the basic structures and vocabulary necessary in work and study life situations, and to tell about his/her use of time and daily routines. - Communicate in travel situations, - tell about working / study day routines - tell time, announce plans - communicate by phone and email. - knows the basic structures: articles, question words, demonstrative adjectives and pro-

nouns, prepositions à, de, en, present tense, reflexive verbs, near future, numbers 70-1000. Proficiency level: A1

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KF00CH32 French 3

KF00CH32 Ranska 3

Abbreviation: KF00CH32

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	French
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Sari Pärssinen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: After completing the course, the student - is able to use the basic structures and vocabulary needed in work and study life situations - can tell about eating habits and order in a restaurant - is able to tell about past events, describe the appearance of people and things and compare things, - knows the difference between the formal and informal communication - knows the structures: articles, adjectives, comparison of adjectives, prepositions, personal pronouns, present, passé composé, partitive, quantitative expressions, numerals 1000 -, ordinal numbers Proficiency level: A1

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KF00CG43 French for Work 1

KF00CG43 Työelämän ranskaa 1

Abbreviation: KF00CG43

Curriculum period	2025-2026

Validity period	since 1 Aug 2025
Credits	3 cr
Languages	French
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Sari Pärssinen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: After the course the student - is able to use the structures and the vocabulary needed in working interaction situations - tell about the jobs and about the working environment - is able to present the basic activities of an enterprise and describe the activities of an organization - can write formal messages - can write a CV - knows how to tell about the future and past events - knows the structures: the pronouns, the present, the imperfect tense and the future form. Proficiency level: A2

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KF00CG44 French for Work 2

KF00CG44 Työelämän ranskaa 2

Abbreviation: KF00CG44

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	French
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Sari Pärssinen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: After completing the course, the student - is able to use the structures and vocabulary necessary in the most important communication situations of working life, mainly written. - is able to present optionally e.g.

company / organization and products, give an elevator speech, tell about entrepreneurship, write a memo. - is able to use subjunctive and conditional Proficiency level: A2

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KF00CL06 Le monde francophone

KF00CL06 Le monde francophone

Abbreviation: KF00CL06

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	French
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Ritva Kosonen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: After the course, the student - knows the countries the belong to the Francofonia or the French-speaking world and has familiarized with some of them - can tell about the tourism, the economics and the culture of different French speaking countries - knows the forms and the use of the subjunctive mood - can tell about the past events by using the imperfect and the perfect tenses.

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		5 cr
¤LAB/LUT: Course Completion		5 cr

KP00CK94 Spanish 1

KP00CK94 Espanja 1

Abbreviation: KP00CK94

Curriculum period	2025-2026
Validity period	since 1 Aug 2025

Credits	3 cr
Languages	Spanish
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Jonna Holkeri, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: After the course the student is able to - use the structures and the vocabulary needed while presenting oneself in working and studying situations - can present himself and tell about himself in spoken and written way - knows the basic rules of pronunciation - knows the basic differences of the formal and the informal communication - is able to ask questions and tell opinions. - knows the basic structures: the Present Tense, the articles, the prepositions, the personal pronouns, the structures that indicates the possession, the negation, the interrogative sentence, the numbers 0-100 Proficiency level: A1

Additional information

EN:

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KP00CH26 Spanish 2

KP00CH26 Espanja 2

Abbreviation: KP00CH26

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	Spanish
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Jonna Holkeri, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: After the course the student - is able to use the structures and the vocabulary needed in working, studying and leisure everyday situations - tell about his/her daily routines (about the family, describing persons, the hobbies, going to the restaurant and shopping, writing an e-mail message) - knows the basic structures: articles, questions words, demonstrative adjectives and pronouns, prepositions, the Present Tense, The Perfect Tense, The near Future, the numbers 100-1000 Proficiency level: A1

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KP00CH27 Spanish 3

KP00CH27 Espanja 3

Abbreviation: KP00CH27

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	Spanish
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Jonna Holkeri, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: After the course the student - is able to use tell about the living, to describe the appearance of persons and things, to compare things - can tell about the past events - knows the structures: adjectives, the comparison, the direct and indirect object pronouns, the reflexive verbs, the gerund, the numbers 1000 -, the ordinary numbers Proficiency level: A1

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KP00CP90 Spanish 6

KP00CP90 Espanja 6

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	Spanish
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Jonna Holkeri, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KP00BX61 Spanish for Working Life 1

KP00BX61 Työelämän espanjaa 1

Abbreviation: KP00BX61

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	Finnish
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Jonna Holkeri, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: After the course the student - is able to use the structures and the vocabulary needed in working interaction situations - tell about the jobs and about the working environment and present the basic activities of an enterprise - can write formal messages - can write a CV - knows how to tell about the future and past events - knows the structures: the pronouns, the present tense, the imperfect tenses, the future, the polite requests (the imperative) Proficiency level: A2

Additional information

EN:

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KP00BX62 Spanish for Working Life 2

KP00BX62 Työelämän espanjaa 2

Abbreviation: KP00BX62

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	Finnish
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Jonna Holkeri, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: After compliting the course, student - is able to communicate mainly written in Spanish in basic business situations and understand the business culture of the Spanish speaking countries. - is able to tell according to choise about, business culture, business communication, meetings, banking, applying for a job in the Spanish speaking world. - is able to use conditional, subjunctive and future. Proficiency level: A2

Additional information

EN:

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KC00DB86 Chinese 1

KC00DB86 Chinese 1

Abbreviation: KC00DB86

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	2 cr
Languages	Chinese
Grading scale	Pass-Fail
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Ritva Kosonen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: The student is able to use - Chinese pinyin pronunciation - simple sentences

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		2 cr
¤LAB/LUT: Course Completion		2 cr

KC00DB87 Chinese 2

KC00DB87 Chinese 2

Abbreviation: KC00DB87

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	Chinese
Grading scale	Pass-Fail
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Ritva Kosonen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: The student is able - to use basic grammar - have daily conversations

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KC00DB88 Chinese 3

KC00DB88 Chinese 3

Abbreviation: KC00DB88

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	4 cr
Languages	Chinese
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Ritva Kosonen, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: The student is able to use Chinese in practical situations, e.g. in airport, train station, hospital and restaurant.

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		4 cr
¤LAB/LUT: Course Completion		4 cr

KR00CL24 Swedish for Beginners

KR00CL24 Swedish for Beginners

Abbreviation: KR00CL24

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT

Responsible organisation	LAB, language 100%
Responsible person	Sirja Fränti, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: The student is able to - identify and use everyday expressions and basic phrases - communicate in simple and routine situations - read and write simple sentences related to the course topics

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr
¤LAB/LUT: Course Completion		3 cr

KM00CO04 Finnish Culture and Society

KM00CO04 Finnish Culture and Society

Abbreviation: KM00CO04

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	3 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Jaana Häkli, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: The student is able to - work and live in Finland or with the Finns without major cultural conflicts. - use the basic information on Finnish history, society, design, welfare state, identity and nature etc. to understand values, customs and habits in Finland. - get deeper cultural experiences in Finland through functional and experiential activities and visits related to Finnish culture.

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		3 cr

¤LAB/LUT: Course Completion 3 cr

KE00CF69 Intercultural Competence and Communication

KE00CF69 Intercultural Competence and Communication

Abbreviation: KE00CF69

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Derek Mitchell, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Learning outcomes

EN: The student is able to: - understand own cultural background and its effect on behaviour and communication. - develop intercultural competence and intercultural communication skills to be able to act effectively in global organizations and cross-cultural environments. - recognize cross-cultural differences and work with them. - understand culture adaptation and adjustment for exchange purposes. - understand the basic concepts of global citizenship and diversity.

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		5 cr
¤LAB/LUT: Course Completion		5 cr

KM00DA70 Multicultural Teamwork and Leadership

KM00DA70 Multicultural Teamwork and Leadership

Abbreviation: KM00DA70

Curriculum period	2025-2026
Validity period	since 1 Aug 2025
Credits	5 cr
Languages	English
Grading scale	General scale, 0-5
University	Lappeenranta-Lahti University of Technology LUT
Responsible organisation	LAB, language 100%
Responsible person	Jaana Häkli, Responsible teacher
Study level	Basic studies
Study field	Fields of education (Ministry of Education and Culture), Humanities

Prerequisites

EN: Details available in Completion methods under the header Teaching

Additional information

EN: First time in academic year 25-26.

Study materials

EN: Details available in Completion methods under the header Teaching

Completion method and assessment items	Recurrence	Credits
Method 1		5 cr
¤LAB/LUT: Course Completion		5 cr