**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.

# LUTKEXCHAUTUMN Exchange Studies (Autumn Semester)
**LUTKEXCHAUTUMN** Exchange Studies (Autumn 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 |
| | Suvi Tiainen, Responsible teacher |
| | |
| Degree programme type | Bachelor's Degree |
| Degree titles | Bachelor of Science (Technology) |
| Study field | Fields of education (Ministry of Education and Culture), Business, administration and law |
| Education classification | 632101 Bachelor of Science (Economics and Business Administration), Business Economics |

## 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.
At LUT students can easily combine technology and business studies under the same roof. 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) 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

# DEGREE STRUCTURE

| Part of the degree | Credits |
| --- | --- |
| **EXCHANGE STUDIES (AUTUMN SEMESTER)** <br> DRAFT | min 20 cr |
| **KEXCHAUTUMNLPR** LAPPEENRANTA, EXCHANGE STUDIES (AUTUMN SEMESTER) <br> DRAFT | min 0 cr |
| **KAKEXCHAUTUMN_LPR** BUSINESS ADMINISTRATION <br> DRAFT | min 0 cr |
| **A380A0320** Applied Consumer Behaviour <br> DRAFT | 6 cr |
| **A130A0620** Basics in MS Excel for Business Students <br> DRAFT | 3 cr |
| **A380A0131** Business Relationships in International Value Networks <br> DRAFT | 6 cr |
| **A240A0010** Introduction to Programmatic Business Analytics <br> DRAFT | 6 cr |
| **A320A0011** Introduction to International Entrepreneurship <br> DRAFT | 6 cr |
| **A380A7001** Introduction to International Business <br> DRAFT | 6 cr |
| **A130A0670** Mathematics for Economics <br> DRAFT | 6 cr |
| **A250A0620** Fundamentals of Accounting and Finance <br> DRAFT | 6 cr |
| **A380A7010** Principles of Management and Leadership <br> DRAFT | 6 cr |
| **KAKEXCHLITOAUTUMN_LPR** BUSINESS ADMINISTRATION ONLY FOR ENGINEERING AND SOCIAL SCIENCE STUDENTS <br> DRAFT | min 0 cr |
| **VA10A1500** Introduction to Entrepreneurship <br> DRAFT | 5 cr |
| **VA10A1700** Understanding and Managing a Business as a Dynamic Whole - Business Simulation Game <br> DRAFT | 5 cr |
| **LAKEXCHAUTUMN_LPR** COMPUTATIONAL ENGINEERING <br> DRAFT | min 0 cr |
| **SAKEXCHAUTUMN_LPR** ELECTRICAL ENGINEERING <br> DRAFT | min 0 cr |
| **BL10A0102** Basics of Electrical Engineering <br> DRAFT | 2 cr |
| **BL20A0710** Introduction to Electrical Power Systems <br> DRAFT | 5 cr |
| **BL30A0510** Introduction to Electrical Drives <br> DRAFT | 3 cr |
| **BL40A3010** Introduction to Electrochemical Energy Storage and Conversion Technologies <br> DRAFT | 4 cr |
| **BL40A0130** Measurement and Control Systems <br> DRAFT | 5 cr |
| **BL40A1732** Digital Electronics <br> DRAFT | 3 cr |

**BL40A5000** Principles of C-Programming `3 cr`
DRAFT

**ENKEXCHAUTUMN_LPR** ENERGY TECHNOLOGY `min 0 cr`
DRAFT

**BH20A0720** Engineering Thermodynamics `6 cr`
DRAFT

**BH10A1900** Fundamentals of Energy Technology `2 cr`
DRAFT

**BH61A0000** Fundamentals of Energy Economics `2 cr`
DRAFT

**BH40A0710** Measurements in Energy Technology `2 cr`
DRAFT

**YMKEXCHAUTUMN_LPR** ENVIRONMENTAL TECHNOLOGY `min 0 cr`
DRAFT

**BH60A7200** Circular.now `3 cr`
DRAFT

**BH60A6801** Sustainable.now `3-5 cr`
DRAFT

**LESKEXCHAUTUMN_LPR** LUT SCHOOL OF ENERGY SYSTEMS `min 0 cr`
DRAFT

**LES10A020** Engineering Physics `3 cr`
DRAFT

**LES10A200** Engineering Mathematics I `3 cr`
DRAFT

**LES10A210** Engineering Mathematics II `3 cr`
DRAFT

**LES10A410** Engineering Project Work `5-10 cr`
DRAFT

**KOKEXCHAUTUMN_LPR** MECHANICAL ENGINEERING `min 0 cr`
DRAFT

**BK10A6202** Mechatronics `5 cr`
DRAFT

**BK10A7300** Machine Elements and Principles `5 cr`
DRAFT

**BK10A6400** Basics of FE-Analysis `4 cr`
DRAFT

**TIKEXCHAUTUMN_LPR** SOFTWARE ENGINEERING `min 0 cr`
DRAFT

**CT30A3232** Basics of Linux `3 cr`
DRAFT

**CT60A5540** Computer networks and Internet `3 cr`
DRAFT

**CT70A9111** Software Development Skills: Front-End `1 cr`
DRAFT

**CT70A9140** Software Development Skills: Full-Stack `3 cr`
DRAFT

**CT70A9120** Software Development Skills: Mobile `3 cr`
DRAFT

**CT30A2910** Introduction to Web Programming `3 cr`
DRAFT

**CT70A9150** Introduction to DevOps `3 cr`
DRAFT

**KEKEXCHAUTUMN_LPR** CHEMICAL ENGINEERING ---------------------------------------------- min 0 cr
`DRAFT`

    **BJ01A5061** Entrepreneurship and Career Opportunities in Raw Materials Sector    3 cr
    `DRAFT`

**YTKEXCHAUTUMN_LPR** SOCIAL SCIENCES ------------------------------------------------------- min 0 cr
`DRAFT`

    **VT10A1400** Environmental Communication    5 cr
    `DRAFT`

    **VT10A1500** Political Communication, Social Movements and Activism    5 cr
    `DRAFT`

**KIEEXCHAUTUMN_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`

        **K200CP86** Finnish for Work 3    5 cr
        `DRAFT`

        **KM00CO04** Finnish Culture and Society    3 cr
        `DRAFT`

        **K200CU41** Suomi with Love 1    3 cr
        `DRAFT`

        **K200DE18** Suomi with Love 2    3 cr
        `DRAFT`

        **K200CS72** Independent study in Finnish    2 cr
        `DRAFT`

    ENGLISH (grouping module)

        **KE00BZ84** English for Professional Development (Business)    4 cr
        `DRAFT`

        **KE00BZ85** English for Professional Development (Technology)    4 cr
        `DRAFT`

        **KE00CG81** Business Writing    3 cr
        `DRAFT`

        **KE00BZ81** Academic Writing    3 cr
        **KE00CG33** Writing for Digital Media    4 cr
        `DRAFT`

        **KE00CQ38** Introduction to Copywriting    2 cr
        `DRAFT`

        **KE00CG79** Professional Reading    3 cr
        `DRAFT`

        **KE00CQ81** Effective Presentations    2 cr
        `DRAFT`

**KE00BZ82** Professional Meetings and Discussions                                                4 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

GERMAN (grouping module)

**KD00CH39** German 1                                                                             3 cr
DRAFT

**KD00CH40** German 2                                                                             3 cr
DRAFT

**KD00CH41** German 3                                                                             3 cr
DRAFT

**KD00CH42** German for Work 1                                                                    3 cr
DRAFT

**KD00CT54** German for Work 3                                                                    3 cr
DRAFT

**KD00BX51** Business German                                                                      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

SPANISH (grouping module)

**KP00CK94** Spanish 1                                                                            3 cr
DRAFT

**KP00CH26** Spanish 2                                                                            3 cr
DRAFT

**KP00CH27** Spanish 3                                                                            3 cr
DRAFT

**KP00BX61** Spanish for Working Life 1                                                           3 cr
DRAFT

**KP00BX62** Spanish for Working Life 2                                                           3 cr
DRAFT

CHINESE (grouping module)

INTERCULTURAL COMPETENCE AND COMMUNICATION (grouping module)

**KM00BX75** Each one teach one                                                                   3 cr
DRAFT

**KE00CF69** Intercultural Competence and Communication                                           5 cr
DRAFT

**KE00CH94** Diversity Management and Global Citizenship                                           5 cr
DRAFT

**KM00CO04** Finnish Culture and Society — 3 cr
`DRAFT`

**KEXCHAUTUMNLAHTI** LAHTI, EXCHANGE STUDIES (AUTUMN SEMESTER) — min 0 cr
`DRAFT`

**KAKEXCHAUTUMN_LAHTI** BUSINESS ADMINISTRATION — min 0 cr
`DRAFT`

**A130A0620** Basics in MS Excel for Business Students — 3 cr
`DRAFT`

**A380A0131** Business Relationships in International Value Networks — 6 cr
`DRAFT`

**KAKEXCHLITOAUTUMN_LAHTI** BUSINESS ADMINISTRATION ONLY FOR ENGINEERING AND SOCIAL SCIENCE STUDENTS — min 0 cr
`DRAFT`

**VA10A1500** Introduction to Entrepreneurship — 5 cr
`DRAFT`

**VA10A1700** Understanding and Managing a Business as a Dynamic Whole - Business Simulation Game — 5 cr
`DRAFT`

**LAKEXCHAUTUMN_LAHTI** COMPUTATIONAL ENGINEERING — min 0 cr
`DRAFT`

**TUKEXCHAUTUMN_LAHTI** INDUSTRIAL ENGINEERING AND MANAGEMENT — min 0 cr
`DRAFT`

**CS39A0120** User-centric engineering — 6 cr
`DRAFT`

**CS39A0070** Managing digital transformation — 6 cr
`DRAFT`

**CS39A0200** Current themes on IEM — 2 cr
`DRAFT`

**CS39A0210** Disability & Accessibility of technology, games and society — 6 cr
`DRAFT`

**CS39A0010** Basics of performance measurement — 6 cr
`DRAFT`

**CS39A0180** Creativity and problem solving — 6 cr
`DRAFT`

**CS30A0210** Product Lifecycle Management — 6 cr
`DRAFT`

**CS20A0090** Basic course in Supply Chain Management — 6 cr
`DRAFT`

**SAKEXCHAUTUMN_LAHTI** ELECTRICAL ENGINEERING — min 0 cr
`DRAFT`

**ENKEXCHAUTUMN_LAHTI** ENERGY TECHNOLOGY — min 0 cr
`DRAFT`

**BH20A0720** Engineering Thermodynamics — 6 cr
`DRAFT`

**BH10A1900** Fundamentals of Energy Technology — 2 cr
`DRAFT`

**BH61A0000** Fundamentals of Energy Economics — 2 cr
`DRAFT`

**BH40A0710** Measurements in Energy Technology — 2 cr
`DRAFT`

**YMKEXCHAUTUMN_LAHTI** ENVIRONMENTAL TECHNOLOGY — min 0 cr
`DRAFT`

**BH60A7200** Circular.now     3 cr
`DRAFT`

**BH60A6801** Sustainable.now     3-5 cr
`DRAFT`

**LESKEXCHAUTUMN_LAHTI** LUT SCHOOL OF ENERGY SYSTEMS     min 0 cr
`DRAFT`

    **LES10A020** Engineering Physics     3 cr
    `DRAFT`

    **LES10A200** Engineering Mathematics I     3 cr
    `DRAFT`

    **LES10A210** Engineering Mathematics II     3 cr
    `DRAFT`

    **LES10A290** Overview of China *     4 cr
    `THERE IS NO VERSION OF THE STUDY IN THE SELECTED CURRICULUM PERIOD`

    **LES10A410** Engineering Project Work     5-10 cr
    `DRAFT`

    **LES10A420** Overview of China *     3 cr
    `THERE IS NO VERSION OF THE STUDY IN THE SELECTED CURRICULUM PERIOD`

**KOKEXCHAUTUMN_LAHTI** MECHANICAL ENGINEERING     min 0 cr
`DRAFT`

**TIKEXCHAUTUMN_LAHTI** SOFTWARE ENGINEERING     min 0 cr
`DRAFT`

    **CT60A0250** Fundamentals of Programming for international programs     6 cr
    `DRAFT`

    **CT60A4500** Fundamentals of Software Testing (Lahti)     3 cr
    `DRAFT`

    **CT60A4050** Fundamentals of Software Engineering     6 cr
    `DRAFT`

    **CT60A5511** Software Quality Management     3 cr
    `DRAFT`

    **CT30A2910** Introduction to Web Programming     3 cr
    `DRAFT`

    **CT30A3232** Basics of Linux     3 cr
    `DRAFT`

    **CT70A9111** Software Development Skills: Front-End     1 cr
    `DRAFT`

    **CT70A9140** Software Development Skills: Full-Stack     3 cr
    `DRAFT`

    **CT70A9120** Software Development Skills: Mobile     3 cr
    `DRAFT`

    **CT70A9150** Introduction to DevOps     3 cr
    `DRAFT`

    **CT60A5540** Computer networks and Internet     3 cr
    `DRAFT`

**KEKEXCHAUTUMN_LAHTI** CHEMICAL ENGINEERING     min 0 cr
`DRAFT`

**YTKEXCHAUTUMN_LAHTI** SOCIAL SCIENCES     min 0 cr
`DRAFT`

**KIEEXCHAUTUMN_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

ENGLISH (grouping module)

**KE00BZ84** English for Professional Development (Business)                                 4 cr
DRAFT

**KE00BZ85** English for Professional Development (Technology)                               4 cr
DRAFT

**KE00CG81** Business Writing                                                                3 cr
DRAFT

**KE00BZ81** Academic Writing                                                                3 cr

**KE00CG33** Writing for Digital Media                                                       4 cr
DRAFT

**KE00CQ38** Introduction to Copywriting                                                     2 cr
DRAFT

**KE00CG79** Professional Reading                                                            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

GERMAN (grouping module)

**KD00CH39** German 1                                                                        3 cr
DRAFT

**KD00CH40** German 2                                                                        3 cr
DRAFT

**KD00CH41** German 3                                                                        3 cr
DRAFT

**KD00CH42** German for Work 1                                                               3 cr
DRAFT

**KD00CT54** German for Work 3                                                               3 cr
DRAFT

**KD00BX51** Business German                                                                 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

SPANISH (grouping module)

    KP00CK94 Spanish 1                            3 cr
    DRAFT

    KP00CH26 Spanish 2                            3 cr
    DRAFT

    KP00CH27 Spanish 3                            3 cr
    DRAFT

    KP00BX61 Spanish for Working Life 1            3 cr
    DRAFT

    KP00BX62 Spanish for Working Life 2            3 cr
    DRAFT

CHINESE (grouping module)

INTERCULTURAL COMPETENCE AND COMMUNICATION (grouping module)

    KM00BX75 Each one teach one              3 cr
    DRAFT

    KE00CF69 Intercultural Competence and Communication   5 cr
    DRAFT

    KE00CH94 Diversity Management and Global Citizenship   5 cr
    DRAFT

    KM00DA70 Multicultural Teamwork and Leadership     5 cr
    DRAFT

    KM00CO04 Finnish Culture and Society           3 cr
    DRAFT

\* Not included because it does not correspond to the selected responsible organisations or curriculum period

# FILTERED COURSES

## A380A0320 Applied Consumer Behaviour

A380A0320 Applied Consumer 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 | Jenni Sipilä, Responsible teacher |
| | Suvi Tiainen, Administrative person |
| | Claudio Piccolo, Responsible teacher |
| Study level | Intermediate studies |
| Study field | Fields of education (Ministry of Education and Culture), Business, administration and law |

### Prerequisites

**EN:** Basics of marketing (Markkinoinnin perusteet).
Recommended prerequisite course for students of SIB-programme: A130A0420 Research Methods in Business Studies.

**Learning outcomes**

**EN:** After taking the course, the students are able to:
· Search and synthesize academic literature and theoretical frameworks pertaining to consumer behavior.

· Develop research questions and hypotheses based on academic literature on consumer behavior.

· Identify the most suitable research methods to address specific research questions related to consumer behavior.

· Collect and analyze qualitative consumer data.

· Collect and analyze quantitative consumer data using the statistics software R.

· Interpret the results of a consumer research project and reflect on their academic and practical implications.

· Work effectively and systematically on a consumer research project.

· Understand and apply the principles of academic writing to their own research reports.

· Present the results of a research project effectively to a professional audience.

**Content**

**EN:** This course provides an overview of consumer behavior as a field of research and practical skills related to consumer data collection and analysis. During the course, students will learn different methods of collecting consumer data along with practical methods of analyzing this data and interpreting results. The key contents are:
The process of conducting a systematic literature review in the field of consumer behavior. Basics of critical reading and synthesis of academic literature. Key theoretical frameworks and their applications in the field of consumer behavior. The process of developing research questions and hypotheses pertaining to consumer behavior.

Basics of qualitative and quantitative research methods in the field of consumer behavior. The process of collecting and analyzing qualitative consumer data (interviews). The process of collecting and analyzing quantitative consumer data (experiments). Statistical analysis of consumer data with R.

Basics of academic writing and reporting of research results. The process of working on a consumer research project as a team. The process of preparing and conducting a presentation of a consumer research project to a professional audience.

**Additional information**

**EN:** The lectures and seminars require physical presence in Lappeenranta.
***

The course is related to UN's Sustainable Development Goals (SDG): 12 responsible consumption and production.

**Study materials**

**EN:** The reading and study materials will be distributed via Moodle.

| Completion method and assessment items | Recurrence | Credits |
|---|---|---|
| Method 1 | Recurrence 1: 1. period-2. 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 |

## 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.

***

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 |

# A240A0010 Introduction to Programmatic Business Analytics
A240A0010 Introduction to Programmatic Business Analytics

| | |
|---|---|
| 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 | Jan Stoklasa, Responsible teacher |
| | Shahid Bhat, Responsible teacher |
| Study level | Intermediate studies |
| Study field | Fields of education (Ministry of Education and Culture), Business, administration and law |

**Prerequisites**

**EN:** A130A0350 Kvantitatiiviset tutkimusmenetelmät (Quantitative Research Methods).

**Learning outcomes**

**EN:** The course introduces business students to the core concepts of algorithmization and programming, to give the students the needed background to start using procedural and object-oriented programming languages for business analytics purposes. Specifically, after completing the course, the student will:
1. Understand the big picture of how programmatic business analytics works from the start to the end, and understand the value of data analytics in facilitating evidence-based business decision-making.
2. Be able to structure problems and break them up into subparts, that can potentially be solved or approached through already available techniques and tools. Modularization and procedural thinking will be developed during the course.
3. Be able to apply basic algorithmic structures (loops, logical conditions, recursive algorithms, sorting algorithms, …) in general in problem solving tasks and in a chosen programming language.

As such the course aims to develop student competences and skills to be able to implement a simple, but complete data analysis process in a chosen programming language or in pseudocode for solution planning purposes. Specific examples from the business analytics context concerning, for example, data scraping, data cleaning and pre-processing, data analytics using statistical methods, data visualization and machine learning will be provided.

**Content**

**EN:** Basics of programming and algorithmic thinking and its implementation in programming languages used in practical business analytics - both procedural and object-oriented (e.g. Pseudocode, Matlab, Python, R, etc.) - and their application in business analytics problems. This involves a recap on basic statistics (e.g., linear regression) and an introduction to machine learning algorithms. The focus is heavily on

hands-on learning (i.e., actual problem structuring, modularization and basics of programming) and on examining business-related problems with real world data.

## Additional information

**EN:** Blended - on campus delivery combined with Datacamp learning platform
Other additional information

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

## Study materials

**EN:** Lecture slides and other presented material.

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

# A320A0011 Introduction to International Entrepreneurship
**A320A0011** Introduction to International Entrepreneurship

Abbreviation: IIE

| | |
|---|---|
| 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 | Ekaterina Albats, 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:** Recommended, but not required: A370A0001 Johtamisen ja yrittäjyyden perusteet; A370A0401 Case-Course of Business; A380A6050 Introduction to International Business and Planning; A130A0550 Introduction to Organizational Behavior

## Learning outcomes

**EN:** After completing the course, students will be able to:
1. describe the phenomenon of international entrepreneurship from theoretical and practical viewpoint

2. characterise entrepreneurial/startup culture

3. describe, evaluate and reproduce the process of international entrepreneurship (startup internationalisation process including opportunity recognition, innovation and value creation, value delivery and value capture/opportunity exploitation) in a variety of contexts

4. understand and assess challenges of international entrepreneurship in a variety of international contexts

5. evaluate, compare and select in a justified manner different internationalisation strategies for new ventures in a variety of contexts

6. demonstrate competences in using tools, primary and/or secondary data sources for strategic analysis and management of a new venture

7. able to create a business development plan and its presentation for a corporate audience with a focus on growth and internationalisation

8. discuss and self-reflect on the role of different personal skills and organisational capabilities in new venture creation and new venture management

9. collaborate in a cross-cultural team.

**Content**

**EN:** Are you considering an entrepreneurial career, work in a small, agile and rapidly growing firm or do you want to develop entrepreneurial and intrapreneurial skills? In all these cases, this course is for you! Despite the rising popularity of entrepreneurship, several challenges await every start-up already at the stages of product/service development, proof of concept and prototyping. Furthermore, multiple managerial issues constantly emerge - dealing with limited resources and fierce competition, a need to build external relations being a small firm, a need in a constant change and agility along with a mission to grow rapidly and internationally. Large firms, as employers, in turn, seek for curious candidates with intrapreneurial mindset - self-motivated, proactive, and action-oriented people who take the initiative to pursue an innovative and international product, service or project.
The course is designed in a way that every student gets a chance to understand the fundamentals of international entrepreneurship, gets a deep dive into the challenges of a start-up using a case study and to develop and test own skills in solving the case specific challenge. The students form teams to solve a complex new venture challenge of their choice. The course encourages a combination of theoretical and practical approaches to building a comprehensive understanding of international entrepreneurship. In addition to a group work on challenge solution, the course also has two individual assignments: a self-reflection assignment and an individual essay-based electronic exam.

**Additional information**

**EN:** Please note: the students who have taken A210A0702 New Venture Management cannot take this course. The course has three assignments: Individual self-reflection assignment (30 points), Group Assignment - Case Study (Presentation-10 points, Report-30 points), electronic individual exam (30 points).

Participation: the course assumes in-person, face-to-face participation as a B.Sc. level course. Participation on the group work presentation day and e-exam is mandatory.

*The course is related to UN's Sustainable Development Goals (SDG): 8 decent work and economic growth, 9 industry, innovation and infrastucture, 17 partnership for the goals*

**Study materials**

**EN:**

- Main Textbook: Hisrich, R., Peters, M. and Shepherd, D. (2023) Entrepreneurship 12th Edition. McGrawHill.
- Schmid, S. (2018). *Internationalization of Business*. Springer International Publishing.
- Lecture materials
- The additional reading materials from academic and business press articles (i.e., case and journal articles) will be distributed during the course.

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

# A380A7001 Introduction to International Business
**A380A7001 Introduction to International Business**

Abbreviation: IIB

| | |
|---|---|
| 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 | Igor Laine, Responsible teacher |
| | Juha Väätänen, Responsible teacher |
| | Suvi Tiainen, Administrative person |
| Study level | Intermediate studies |
| Study field | Fields of education (Ministry of Education and Culture), Business, administration and law |

## Equivalences to other studies

CS10A0262 International Business Essentials

## Learning outcomes

**EN:** After successful completion of the course, students should be able to:
1. understand the notion and key concepts of international business
2. describe and discuss major theories of international business
3. identify and evaluate strategy and competitiveness in international business
4. understand and justify major decisions in international business, including decisions on market selection and entry modes
5. discuss challenges of managing multinational enterprises

## Content

**EN:** International business theories. International competitiveness. Regional economic integration. International business strategy. Market selection and entry modes in international business. Managing multinational enterprise. International Entrepreneurship.

## Additional information

**EN:** Contact teaching at the Lappeenranta campus. In case of reaching the maximum number of spots in the course, priority will be given to students of LBS.
***

The course is related to UN's Sustainable Development Goals (SDG): 8 decent work and economic growth, 9 industry, innovation and infrastructure, 12 responsible consumption and production, 16 peace, justice and strong institutions, 17 partnership for the goals

## Study materials

**EN:** Cavusgil S.T., Knight G., Reisenberger J., 2024, International Business: The New Realities (6th edition), Harlow, UK: Pearson Education Ltd.
Hollensen S. 2020 Global Marketing (8th edition), Harlow, UK: Pearson Education Ltd.

Additional materials will be announced in class and in Moodle.

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

# A130A0670 Mathematics for Economics

**A130A0670 Mathematics 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 | Olli-Pekka Hämäläinen, 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 taking the course, the students should be able to:
- Estimate elemental probabilities

- Solve basic equations (polynomial, exponential, logarithmic)

- Analyze the behavior of elemental functions using equations and differential & integral calculus

- Perform basic matrix calculations and solve systems of linear equations using matrices

- Model and analyze cost, revenue and profit with functions

- Understand arithmetic and geometric series & their connection with loan and investment calculations as well as perform these calculations using different interest rates.

### Content

**EN:** Probability theory, equation solving, functions and function behavior analysis, differentiation, integration. Linear algebra, matrix calculations, Gaussian elimination. Functions in business (cost, revenue, profit), financial applications of differential and integral calculus. Arithmetic and geometric series, loan and investing calculations.

### Additional information

**EN:** Course is only available for students who are stydying in Bachelor's Programme in Sustainable International Business.
The course is related to UN's Sustainable Development Goals (SDG): Not relevant

### Study materials

**EN:** Lecture materials in Moodle.

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

| Method 2 | Recurrence 1: 1. period-2. period | 6 cr |
|---|---|---|
| Course Registration | | 0 cr |
| Midterm Exam 1 | | 0 cr |
| Midterm Exam 2 | | 6 cr |

## A250A0620 Fundamentals of Accounting and Finance

**A250A0620** Fundamentals of Accounting and Finance

| | |
|---|---|
| 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 | Henri Huovinen, 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:**
Upon completing this course, students will achieve the following learning outcomes:

- Establish a solid foundation in accounting and finance to support informed decision-making.
- Learn fundamental principles of financial and managerial accounting.
- Understand the financial statements and apply ratio analysis.
- Develop an understanding of cost accounting and its role in business operations.
- Gain a skillset in the valuation of major asset classes and their risk-return characteristics.
- Learn the principles of Modern Portfolio Theory and its applications in investment decisions.

### Content

**EN:** The course covers key areas of accounting and finance, including financial and managerial accounting principles, financial statement preparation and analysis, cost accounting and budgeting, corporate finance fundamentals, valuation of cash flows and financial assets, capital structure and payout policy, risk and return concepts, short-term finance and working capital management, and long-term financial decision-making.

### Additional information

**EN:** The course is related to UN's Sustainable Development Goals (SDG): 16 peace, justice and strong institutions

### Study materials

**EN:**
Lecture notes and the following recommended textbooks:

- Financial Accounting (11th Edition or newer) by Libby, Libby, and Hodge
- Managerial Accounting (17th Edition or newer) by Garrison, Noreen, and Brewer
- Principles of Corporate Finance (13th Edition or newer) by Brealey, Myers, and Allen

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

# A380A7010 Principles of Management and Leadership

A380A7010 Principles of Management and Leadership

| | |
|---|---|
| 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 | Kirsimarja Blomqvist, Responsible teacher |
| | Mariana Galvão Lyra, Responsible teacher |
| | Outi Behm, Responsible teacher |
| Study level | Basic studies |
| Study field | Fields of education (Ministry of Education and Culture), Business, administration and law |

## Learning outcomes

**EN:** The course empowers students with the skills to make meaningful changes in the world by leading and managing organizations. Students will learn
1. to demonstrate an understanding of management functions: planning, organizing, leading, and controlling, as well as leadership styles,
2. to describe and apply concepts, theories, and practices relevant to exercising management and leadership in modern organizations,
3. to demonstrate ethical, sustainable, and socially responsible decision-making and management practices,
4. collectively map organizational management and leadership challenges, and
5. co-create solutions to manage these challenges effectively and efficiently.

## Content

**EN:** The course focuses on planning, organizing, leading, and controlling, management theories, managerial roles, and leadership styles. The topics are discussed in a global context – global economy, free trade, sustainable business, and global south-north differences – requiring an ethical and sustainable approach to management and leadership. The course is highly interactive, connecting theory and practice through inviting industry guests as well as a team workshop carried out by an external lecturer.

## Additional information

**EN:** Priority is given to B.Sc. of Sustainable international business programme students.

The course is part of the UN's Sustainable Development Goals (SDG): 8,9 and 17.

## Study materials

**EN:**

- Kinicki, A., & Williams, B. K. (2024). Management: A practical introduction. McGraw-Hill.
- Lecture slides
- Additional materials: in class and Moodle

| Completion method and assessment items | Recurrence | Credits |
|---|---|---|
| **Method 1** | Recurrence 1: 2. period | 6 cr |
| Course completion | | 6 cr |

# BL10A0102 Basics of Electrical Engineering

**BL10A0102** Basics of Electrical Engineering

| | |
|---|---|
| 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 | LES, Electrical Engineering 100% |
| Responsible persons | Minna Loikkanen, Administrative person |
| | Pia Lindh, Responsible teacher |
| | Mehar Ullah, 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:** Upon completion of the course the student will be able to list the most essential electric supply methods, solve simple DC and AC systems and understands how transformer and generator works. Student should be able to determine the most important end-uses of electricity, explain electricity price formation, identify applications of electrical engineering and understand their operation principles.

## Content

**EN:** The "Basics of Electrical Engineering" course provides a comprehensive understanding of the key concepts, principles, and applications of electrical engineering. The course introduces the basic calculation of electricity with the help of, for example, Ohm's and Kirchhoff's laws. In addition, students become familiar with electromagnetic phenomena, such as electric and magnetic fields, and their interaction. In addition, the course introduces electricity production methods and examines electricity consumption in different sectors, such as industry, services and housing. Students also learn about different types of electric drives, such as different motor types and power electronics. The course also provides an overview of the operation of the Finnish electricity transmission network and the related electricity market. This gives students a holistic view of the basics of electrical engineering and their practical applications.
Use of AI applications:Artificial intelligence applications can be used according to general policies of LUT.

## Additional information

**EN:** The course is related to UN's Sustainable Development Goals (SDG): 7 affortable and clean energy, 13 climate action, 15 life and land.

## Study materials

**EN:** Course material, e.g. lecture material is in the Moodle learning environment.

| Completion method and assessment items | Recurrence | Credits |
|---|---|---|
| **Method 1** | Recurrence 1: 1. period | 2 cr |

| | | |
|---|---|---|
| ¤LUT/LAB: Course Completion | | 2 cr |
| Method 2 | Recurrence 1: 1. period | 2 cr |
| ¤LUT/LAB: Course Completion | | 2 cr |

# BL20A0710 Introduction to Electrical Power Systems
BL20A0710 Introduction to Electrical Power 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, Electrical Engineering 100% |
| Responsible persons | Minna Loikkanen, Administrative person |
| | Jukka Lassila, Responsible teacher |
| | Juha Haakana, Responsible teacher |
| Study level | Basic studies |
| Study field | Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction |

## Prerequisites

**EN:** BL10A0100 Basics of Electrical Engineering and BL30A0000 Electric circuits attended.

## Equivalences to other studies

BL20A0701 Introduction to Electric Power Systems

## Learning outcomes

**EN:** Upon completion of the course the student will be able to: 1. describe the essential operating principles of an electric power system, i.e., principles of power balance and voltage control management, 2. calculate the voltages, load currents, losses, symmetrical fault currents and costs in electric power systems, 3. describe the basic phenomena and calculation principles related to static and transient stability, 4. describe basics of electricity markets.

## Content

**EN:** Operation of electricity market. Interconnection of electric power systems. Components and their equivalent circuits in electric power systems. Calculation of transmission and distribution networks. An overview of high voltage and equipment technology. Electricity quality factors. Basics of electricity markets.
## Company co-operation

No company co-operation

## 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 assignments by own produced text. Students are not allowed to present AI-generated text as their own.

## Additional information

**EN:** Contact teaching
***

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

7 affordable and clean energy

**Study materials**

**EN:** E-book: Electric power systems by Weedy, Brian B.
Additional learning material (lecture slides) is based on the latest research and is distributed to students in Moodle.

| Completion method and assessment items | Recurrence | Credits |
|---|---|---|
| Method 1 | Recurrence 1: 1. period | 5 cr |
|   Course Assessment | | 5 cr |
|   Course Registration | | 0 cr |
| Method 2 | Recurrence 1: 1. period | 5 cr |
|   Course Assessment | | 5 cr |
|   Course Registration | | 0 cr |

# BL30A0510 Introduction to Electrical Drives
BL30A0510 Introduction to Electrical Drives

| | |
|---|---|
| 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 |
| | Lasse Laurila, Responsible teacher |
| Study level | Basic studies |
| Study field | Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction |

**Prerequisites**

**EN:** Recommended: BL 10A0102 Basics of Electrical Engineering, BL30A0000 Electric Circuits completed and BL30A0300 Electromagnetism attended.

**Recommended prerequisites**

BL30A0001 Electric Circuits

BL30A0300 Electromagnetism

BL10A0102 Basics of Electrical Engineering

**Equivalences to other studies**

BL30A0500 Introduction to Electrical Drives

**Learning outcomes**

**EN:** Upon completion of the course the student will be able to describe the principles of electric motors and frequency converters and recognize terms in the field of electric drives. The student can solve simple calculation problems in the field of electric drives.

**Content**

**EN:** Operation of electromechanical and electromagnetic devices, current vector, torque. Basic types and operation principles of rotating electrical machines: general rotating field machine, DC machine, asynchro-

nous machine, synchronous machine, reluctance machine. Energy efficient electric motor drives. Control principles: scalar, vector and direct torque control (DTC). Applications. Electrical energy storages.

**Additional information**

**EN:** The course is related to UN's Sustainable Development Goals (SDG): 7 affortable and clean energy, 13 climate action, 15 life and land

**Study materials**

**EN:** The study materials are based on research and distributed to students in Moodle. Including lecture and exercise materials. Recommended to follow also additional material listed in Moodle and lecture materials.

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

## BL40A3010 Introduction to Electrochemical Energy Storage and Conversion Technologies

BL40A3010 Introduction to Electrochemical Energy Storage and Conversion Technologies

| | |
|---|---|
| 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 |
| | Pertti Kauranen, Responsible teacher |
| Study level | Intermediate studies |
| Study field | Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction |

**Recommended prerequisites**

BJ01A1011 General and Inorganic Chemistry

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

## BL40A0130 Measurement and Control Systems

BL40A0130 Measurement and Control 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, Electrical Engineering 100% |
| Responsible persons | 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 |

## Prerequisites

**EN:** Basics of differential equations, basics of complex numbers.

## Learning outcomes

**EN:** A student will be able to:

- Assess the suitability of measurement equipment for a given application based on available information and estimate its measurement uncertainty.
- Select appropriate components for a measurement system and develop a measurement plan.
- Derive differential equation-based models for simple dynamic systems.
- Convert differential equations into state-space representations.
- Determine transfer functions from differential equations.
- Analyze the stability of dynamic systems using standard methods.
- Evaluate the dynamic behavior of first- and second-order systems and adjust their response using basic controllers.

## Content

**EN:** Basic terms describing the static and dynamic characteristics of measurement systems, Measurement accuracy, uncertainty, sensor principles, and digitization of measurement signals, Dynamic modeling of linear systems, including transfer functions and analysis in the Laplace domain, Core concepts of control engineering, including compensators and controllers, The relationship between time and frequency domains in system analysis, Analytical methods for controller tuning, State-space representations of dynamic systems, Application of MATLAB and Simulink for solving control problems.

## 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

## 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: 1. period-2. period, 1. period-2. period | 5 cr |
| Course Registration | | 0 cr |
| Course Assessment | | 5 cr |

# BL40A1732 Digital Electronics
**BL40A1732** Digital Electronics

| | |
|---|---|
| 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 |
| | Lauri Järvinen, Responsible teacher |
| | Mohammad Khan, Responsible teacher |
| | |
| Study level | Intermediate studies |
| Study field | Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction |

### Prerequisites

**EN:** Basic Electronics

### Equivalences to other studies

BL40A1730 Digital Design

### Learning outcomes

**EN:** By the end of this course, students will be able to:
· Explain the fundamental concepts of digital number representation and Boolean algebra.

· Design and analyze combinational logic circuits consisting of basic components like gates, multiplexers, and decoders.

· Explain the principles of sequential logic consisting of flip-flops and counters.

· Explain the basics of processor operating principles, architecture,

· Explain embedded systems, including common peripherals and memory types.

· Describe programmable logic devices and their applications.


· Design, simulate, and implement simple digital systems.

### Content

**EN:** Digital representations and number systems. Logic circuit implementation, gates, sequential logic. Memory and processor architecture basics. Embedded systems with microcontrollers and I/O interfaces. Programmable logic devices.


### Additional information

**EN:**

- Course is related to the UN Sustainable Development Goals (SDG): 7 affordable and clean energy
- Use of AI applications should be according to the university regulations.

### Study materials

**EN:** The learning material is based on the latest research and is distributed to students in Moodle

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

# BL40A5000 Principles of C-Programming

**BL40A5000 Principles of C-Programming**

| | |
| --- | --- |
| 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 |
| | Mehar Ullah, Responsible teacher |
| Study level | Basic studies |
| Study field | Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction |

**Prerequisites**

**EN:** No any prerequisite required for this course

**Equivalences to other studies**

LES10A110 Principles of C-programming

**Learning outcomes**

**EN:** Student who successfully complete the course will demonstrate the following outcomes:
1. Applies basic concepts, such as flow control, loops, understands concepts of procedural and object-oriented programming;
2. Understands basic commands, data types/structures, and libraries;
3. Structures the program to make it efficient, understandable, maintainable, and extendable;
4. Understands memory management principles such as static or dynamic allocation;
5. Understands fundamentals of computer architecture and is familiar with von Neumann architecture.
6. Understands disassembly listings of C programs and can debug programs execution using the listing and step by step tracing in a debug/simulated environment.
7. Understands operations occurring in linking process and can read and modify existing link scripts for gcc linker.

8. Understands file handling (opening, reading, writing and closing files)

**Content**

**EN:** Introduction to C-programming , syntax, variables, data types, data structures, flow control, loops, functions, pointers and memory management, file input/output, string operations, memory management, good programming practices, make, gcc, core principles of computer architecture and RISC-V assembler, file handling

**Additional information**

**EN:**

- The course is related to UN's Sustainable Development Goals (SDG): 7 affordable and clean energy, 9 industry, innovation and infrastructure, 11 sustainable cities and communities
- There might be slight changes in course contents during the course according to the requirements
- Course will be in person at Lappeenranta campus and if needed will be streamed to the other campuses.
- AI tools can only be used according to the university rules (https://elut.lut.fi/en/completing-studies/rules-and-regulations/ai-based-tools-policies)

**Study materials**

**EN:** Lecture slides, video materials in Moodle, book "Modern C for Absolute Beginners second edition by Slobodan Dmitrovic"

**Literature**

Lecture slides will be used in Moodle and also we will use some videos to explain different topics. The book used in this course is "Modern C for Absolute Beginners second edition by Slobodan Dmitrovic" and is available on the LUT.primo "https://lut.primo.exlibrisgroup.com/view/action/uresolver.do?operation=resolveService&package_service_id=4138188870006254&institutionId=6254&customerId=6245&VE=true".

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

# BH20A0720 Engineering Thermodynamics
BH20A0720 Engineering Thermodynamics

| | |
|---|---|
| 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 |
| | Srujal Shah, 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 are familiar with basic concepts in energy technology, such as temperature, state properties, systems and processes, control volume analysis, different forms of energy and fundamental laws of thermodynamics. Students are able to use different charts and tables to find thermodynamic properties of different substances. After completing the course students can formulate the equation for the conservation of energy for an open control volume. Students are able to calculate heat, work and entropy change in ideal gas compression. Students understand the working principle of a heat engine and importance of Carnot-efficiency as a limit for the theoretical maximum efficiency of any heat engine. Students can apply fundamental laws and equations of thermodynamics for studying different processes (especially related to energy and environmental technology). Students are able to calculate basic heating and air-conditioning processes. Students understand working principle of heat pump and refrigeration systems and can calculate operational values of such processes. Students understand working principle of different energy conversion processes and can solve simple internal combustion engine, gas turbine and steam power processes.

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:** Basic concepts: state, process, system. Thermodynamical properties, ideal and real gas laws. The first law of thermodynamics, concepts, energy, work, heat, internal energy. Expansion and compression work for isothermal, isentropic and polytropic processes. The second law of thermodynamics, Carnot-process, heat engines, isentropic efficiency. Thermoeconomics, exergy. Ideal gas mixtures, heating, ventilation and air-conditioning processes, refrigeration and heat pump systems, energy conversion processes: internal combustion engine, steam power plant, gas turbine process. Course includes Power-to-X themes.

**Additional information**

**EN:** Note
Parallel to Course BH20A0750 Engineering Thermodynamics (in Finnish), common exams, mid-term exams and exercises, separate lectures.

The course is related to UN's Sustainable Development Goals (SDG): 7 Affordable and Clean Energy, 9 Industry, Innovation and Infrastructure, 11 Sustainable Cities and Communities, 13 Climate Action

**Study materials**

**EN:** Online material on Moodle, 'Thermodynamic tables' handout, enthalpy and entropy chart for steam. The relevant parts of Moran, M.J. ; Shapiro, H.N.: Fundamentals of Engineering Thermodynamics, 5th ed. 2004 or later.

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

# BH61A0000 Fundamentals of Energy Economics
**BH61A0000** Energiatalouden johdantokurssi

| | |
|---|---|
| Curriculum period | 2025-2026 |
| Validity period | since 1 Aug 2025 |
| Credits | 2 cr |
| Languages | English, Finnish |
| 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 student will be able to: 1. apply alternative investment calculation methods in energy investments, 2. calculate the energy contents of fuels in different energy units, 3. de-

scribe the fundamentals of energy production methods and the applicable fuel options, 4. describe the grounds for the fuel price determination, and 5. identify the grounds for the security of energy supply.

**Content**

**EN:** Finnish energy economics. Principles of investment calculation methods. Main energy units and heat value of fuels. Energy chain of fuels. Principles and efficiencies of energy production methods. Fuel prices and the effect of emission trading. Maintenance and delivery reliability.

**Additional information**

**EN:** The implementation in Finnish is lectured in Lappeenranta and it is meant for all the other students but B.Sc. DD.
The implementation in English is lectured in Lahti and is meant for the students of the B.Sc. DD programmes taught in English only.
The course is related to UN's Sustainable Development Goals (SDG): affordable and clean energy, decent work and economic growth, industry, innovation and infrastucture, sustainable cities and communities, climate action

**Study materials**

**EN:** The learning material is based on the latest research and is distributed to students in Moodle.

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

# BH40A0710 Measurements in Energy Technology
BH40A0710 Measurements in Energy Technology

| | |
|---|---|
| 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 | LES, Energy Technology 100% |
| Responsible persons | Minna Loikkanen, Administrative person |
| | Pekka Punnonen, Responsible teacher |
| | Maria Olkku, Responsible teacher |
| Study level | Intermediate 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. recognize temperature, pressure, mass and volume flow, flow velocity and air humidity measurements devices in related to energy technology processes, 2. performance practical calculation needed in measurements,
and 6. understand basics of uncertainty of measurements.
Completion of the course supports the development of the following generic competences for working life: mathematics and natural sciences, practical application of theories

## Content

**EN:** Examples of measurements in Energy Technology. Physical quantities and units. Least squares method (LSM). Temperature and pressure measurements. Flow and velocity measurements. Shaft power measurement and air humidity measurements. Flow visualization. Introduction to uncertainty of measurements.

## 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:** Venkateshan S.P. (2022). Mechanical Measurements.
Stephanie Bell (1999). A Beginner's Guide To Uncertainity of Measurement. National Physics Laboratory.

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

# 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 |

# LES10A020 Engineering Physics

**LES10A020 Engineering 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 | LUT School of Energy Systems 100% |
| Responsible persons | Annukka Ilves, Administrative person |
| | Minna Loikkanen, Administrative person |
| | Mikko Äijälä, Responsible teacher |
| | Paula Immonen, Responsible teacher |
| | Ayesha Sadiqa, 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:** High school level of Physics and Mathematics

**Learning outcomes**

**EN:** After successfully completing the course, students are able to:

**1.** approach physics problems in a systematic way, connecting physics phenomena to theory, using the SI system and evaluating accuracy.

**2.** solve simple qualitative and quantitative physics problems related to course contents.

**3.** communicate and collaborate with peers, verbalise physics knowledge in English, use educational technologies, and develop confidence as a university student.

### Content

**EN:**
1. **Electricity and magnetism:** electrostatics, direct-current circuits, basics of magnetism, electromagnetic induction
2. **Thermal physics:** thermodynamic systems and quantities, thermal expansion and heat transfer, phase changes and ideal gas law, laws of thermodynamics, heat engines.
3. **Oscillations and waves:** periodic and circular motion, harmonic oscillation, harmonic waves, mechanical and electromagnetic waves.

### Additional information

**EN:** 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, and 17 partnership for the goals.

### Study materials

**EN:** Course textbooks (online), lecture notes, videos, online exercises.

### Literature

Urone, P. P., & Hinrichs, R. (2012). College Physics (OpenStax).

Moebs, W., Ling, S. J., & Sanny, J. (2016). University Physics Volume 1. Rice University.

Ling, S. J., Sanny, J., Moebs, W., Friedman, G., Druger, S. D., Kolakowska, A., ... & Wheelock, K. (2016). University Physics Volume 2.

Halliday, D., Resnick, R., & Walker, J. (2013). Fundamentals of physics. John Wiley & Sons.

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

# LES10A200 Engineering Mathematics I

**LES10A200** Engineering Mathematics I

Abbreviation: EMI

| | |
|---|---|
| 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 | LUT School of Energy Systems 100% |
| Responsible persons | Barkat Bhayo, Responsible teacher |
| | Annukka Ilves, Administrative person |
| | Minna Loikkanen, Administrative person |
| Study level | Basic studies |

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

## Prerequisites

**EN:** Basic knowledge of fundamental mathematics

## Equivalences to other studies

LES10A010 Engineering Mathematics 1

## Learning outcomes

**EN:** After completing this course, students will learn calculations and the utilization of formulas and identities to simplify mathematical expressions and solve equations. Moreover, they will grasp the concepts of limits and derivatives, enabling them to evaluate questions related to these topics by applying the rules of limits and derivatives, and understanding their applications in engineering problems. Additionally, students will acquire the ability to evaluate various types of integrals and measure the area and volume of geometrically shaped bodies, and applications in Engineering (electrical, energy & environmental, and mechanical). Furthermore, they will develop a basic understanding of modeling and solving initial value problems.

## Content

**EN: Function theory:** definition of difference types of functions, inverse function, composite function, and their inverse, usage of functions in engineering problems
**Trigonometric functions:** Definitions, identities of trigonometric functions, modelling waves, current waveforms, sinusoidal voltage signals.

**Limit:** definition of limit, continuity and discontinuity, limit of composite functions.

**Differentiation:** slope, Newton Quotient, definition of limit, rules of differentiation, Chain rule, higher order derivative, rate of change, monotonicity, maximum and minimum, extrema, application problems in engineering, L'Hôpital's rule.

**Integration:** definition and rules of integration, initial values problems, change of variables, Riemann sums and definite integral, applications of integration (mean and average of a function, area under the curve, area bounded by region, arc length, volume of solid), techniques of integration.

## Additional information

**EN:** This course replaces LES10A010 Engineering Mathematics 1 together with LES10A210 Engineering Mathematics II.

Moreover, 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, and 17 partnership for the goals.

## Study materials

**EN:** Lecture material and other material are given during the course.

## Literature

Robert A. Adams: Calculus - A Complete Course (any edition)

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

# LES10A210 Engineering Mathematics II
**LES10A210** Engineering Mathematics II

Abbreviation: LES10A210 EMII

| | |
|---|---|
| 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 | LUT School of Energy Systems 100% |
| Responsible persons | Barkat Bhayo, Responsible teacher |
| | Annukka Ilves, Administrative person |
| | Minna Loikkanen, Administrative person |
| | Juho Ratava, 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 fundamental mathematics

## Equivalences to other studies

LES10A010 Engineering Mathematics 1

## Learning outcomes

**EN:** After completing this course, students will achieve the knowledge of parametrizing curves and solving related problems. Moreover, they will gain conceptual understanding of matrices and their operations, along with applications. Students will be able to interpret engineering problems using vectors and find solutions by applying vector properties and operations. They will also attain knowledge of complex numbers, their mappings, and applications of analytic and harmonic functions in engineering (electrical, energy & environmental, and mechanical).

## Content

**EN: Curves:** Curves and their types, parametric equations, length of curve, area of surface of revolution. **Coordinates:** Polar coordinates, cylindrical and spherical coordinates, and their applications

**Matrices :** Definition and operations on matrices, pixel, applications to transformation, determinant, Cramer's rule, inverse of matrix, solving system of linear equations, Gaussian elimination, eigenvalues, characteristic equation.

**Vectors:** Definition, dot product, cross product, work, are of parallelogram, volume of parallelepiped, coplanar vectors, vector equation of line, distance from a point to line or plane, applications in engineering.

**Complex analysis**: Definition, operations of complex numbers, polar form, Euler's formula, complex mappings, functions of complex variables, analytic function, harmonic function, applications in engineering, Möbius transformation, conformal mappings, and their applications in engineering.

## Additional information

**EN:** This course replaces LES10A010 Engineering Mathematics 1 together with LES10A200 Engineering Mathematics I. The course is related to UN's Sustainable Development Goals (SDG): 4 quality education, 5 gender equality, 10 reduced inequalities

## Study materials

**EN:** Lecture notes and course material will be provided during the course.
Optionally Robert A. Adams: Calculus - A Complete Course, and/or Erwin Kreyszig: Advanced Engineering Mathematics.

## Literature

Robert A. Adams: Calculus - A Complete Course
Erwin Kreyszig: Advanced Engineering Mathematics

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

# BK10A6202 Mechatronics
**BK10A6202 Mechatronics**

| | |
|---|---|
| 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 | LES, Mechanical Engineering 100% |
| Responsible persons | Annukka Ilves, Administrative person |
| | Heikki Handroos, Responsible teacher |
| | Ming Li, Contact-info |
| Study level | Intermediate studies |
| Study field | Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction |

**Equivalences to other studies**

BK60A0200 Mechatronics

**Equivalences (free text field)**

**EN:** BK10A6200 Mechatronics 5 ECTS cr

**Learning outcomes**

**EN:** After successfully completing the course, students are able to:
· summarize the structures, properties, advantages and drawbacks associated with different mechatronic transmissions.
· select an appropriate control, sensor and data transmission system for various kinds of mechatronic machines
· dimension, compare and select appropriate components for a mechatronic system<
· develop a PLC-based control for a mechatronic machine

**Content**

**EN:** Typical designs of mechatronic systems in various industrial machines and processes. Structures, operating principles and selection criteria of mechatronic components. Dimensioning hydraulic, pneumatic and electrical transmissions by using mathematical equations. Selection criteria for sensors and control systems. Accuracy of measurement and sensing systems. Intelligent materials in actuators.

**Study materials**

**EN:** Lecture notes in the Moodle

| Completion method and assessment items | Recurrence | Credits |
| --- | --- | --- |
| Method 1 | Recurrence 1: 1. period-2. period | 5 cr |
| ¤LAB/LUT: Course Assessment | | 5 cr |
| ¤LAB/LUT: Course Registration | | 0 cr |
| Method 2 | Recurrence 1: 1. period-2. period | 5 cr |
| ¤LAB/LUT: Course Registration | | 0 cr |
| ¤LAB/LUT: Midterm Exam 1 | | 0 cr |
| ¤LAB/LUT: Midterm Exam 2 | | 5 cr |
| Method 3 | Recurrence 1: 1. period-2. period | 5 cr |
| ¤LAB/LUT: Course Assessment | | 5 cr |
| ¤LAB/LUT: Course Registration | | 0 cr |
| Method 4 | Recurrence 1: 1. period-2. period | 5 cr |
| ¤LAB/LUT: Course Registration | | 0 cr |
| ¤LAB/LUT: Midterm Exam 1 | | 0 cr |
| ¤LAB/LUT: Midterm Exam 2 | | 5 cr |

# BK10A7300 Machine Elements and Principles
BK10A7300 Machine Elements and Principles

| | |
| --- | --- |
| 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 |
| | Changyang Li, Responsible teacher |
| Study level | Intermediate studies |
| Study field | Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction |

**Compulsory prerequisites**

BK10A6300 Engineering Design

BK80A4000 Engineering Mechanics I

BK80A4010 Engineering Mechanics II

or

BK10A5800 Engineering Mechanics 1

BK80A4010 Engineering Mechanics II

BK10A6300 Engineering Design

or

BK80A4000 Engineering Mechanics I

BK10A6000 Engineering Mechanics 2

BK10A6300 Engineering Design

or

BK10A5800 Engineering Mechanics 1

BK10A6000 Engineering Mechanics 2

BK10A6300 Engineering Design

**Equivalences to other studies**

BK65A0203 Engineering Design

**Learning outcomes**

**EN:** Students who complete the course will demonstrate the following outcomes by project work and written report:
- how to work target-oriented in a machine design team

- how to design or select machine elements for improved performance

In addition, a student understands the basic skills and knowledge required in real-world machine element design. Key learning outcomes are

- Understanding the relations between distance, time, velocity, and acceleration

- Applying vector mechanics to solve kinematic problems

- Creating schematic drawings of real-world mechanisms

- Determining the degrees of freedom (mobility) of a mechanism

- Using graphical and analytic methods to study the motion of planar mechanisms

- Using computer software to study the motion of a mechanism

- Designing cam and gear mechanisms

- Distinguishing the machine elements of machinery

- Understanding the impact of lubrication on machine elements

**Content**

**EN:** This course builds upon students' preliminary engineering mechanics and design knowledge. The aim is to help students understand the interactions between machine elements and how they affect the performance of mechanical systems. The course covers advanced concepts of the theory of machines and mechanisms and lubrication. The focus is on practices and procedures that will give students the expertise to

apply kinematics analysis in designing mechanisms and understand how to synthesize the linkages in such mechanisms. The lubrication of machine elements is an essential aspect of the course as it governs the performance of mechanical components. The technical considerations primarily relate to the interaction between machine elements. We aim to demonstrate engineering procedures that involve selecting, specifying, designing, and sizing mechanisms to achieve specific motion objectives.

**Additional information**

**EN:** This course is related to all UN's Sustainable Development Goals (SDG): 7 and 11.

**Study materials**

**EN:** 1. Uicker Jr., John J and Pennock, Gordon R and Shigley, Joseph E, (2017). Theory of Machines and Mechanisms. (5th ed.) Cambridge University Press
2. Schmid, Steven R, Hamrock, Bernard J and Jacobson, Bo O, (2013). Fundamentals of Machine Elements (3rd ed.). CRC Press

**Literature**

Uicker Jr., John J and Pennock, Gordon R and Shigley, Joseph E, (2017). Theory of Machines and Mechanisms. (5th ed.) Cambridge University Press

Schmid, Steven R, Hamrock, Bernard J and Jacobson, Bo O, (2013). Fundamentals of Machine Elements (3rd ed.). CRC Press

Norton, RL, (2020). Design of Machinery: An Introduction to the Synthesis and Analysis of Mechanisms and Machines. (6th ed.) McGraw-Hill Education,

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

# BK10A6400 Basics of FE-Analysis
BK10A6400 Basics of FE-Analysis

| | |
|---|---|
| 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, Mechanical Engineering 100% |
| Responsible persons | Marko Matikainen, Responsible teacher |
| | Annukka Ilves, Administrative person |
| | Antti Ahola, Responsible teacher |
| | Changyang Li, Responsible teacher |
| Study level | Intermediate studies |
| Study field | Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction |

**Prerequisites**

**EN:** BK10A6000 Engineering Mechanics 2 completed

**Equivalences to other studies**

BK80A2800 FE-analysis, Elementary Course

**Learning outcomes**

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

- Understand the mathematical and physical foundations of the displacement-based Finite Element (FE) method.
- Analyze statically loaded mechanical structures using both MATLAB and commercial FE analysis software.
- Solve eigenvalue problems of mechanical structures using MATLAB and commercial FE analysis software.
- Utilize Large Language Models (LLMs) and other AI-based tools to develop and code a basic FE solver in MATLAB.
- Assess the robustness, accuracy, and efficiency of FE solutions.

**Content**

**EN:** The objective of the lectures is to impart a fundamental understanding of the elemental stiffness matrices for rod, beam, and solid structures, the assembly of the global stiffness matrix, the imposing of boundary conditions and loads, and the solution strategies for both static and linearised dynamic problems analysed using the finite element method. The exercises will introduce FE analysis using commercial FE software.

**Additional information**

**EN:** ***
The course is related to UN's Sustainable Development Goals (SDG): 9 Industry, Innovation and Infrastructure, 11 Sustainable Cities and Communities, 12 Responsible consumption and Production, 13 Climate Action, 17 Partnerships for the Goals

**Study materials**

**EN:** Lectures notes in the Moodle.

**Literature**

Cook, Robert D., Finite element modeling for stress analysis

Hughes, Thomas J.R., Finite Element Method: Linear Static And Dynamic Finite Element Analysis

Hakala M.K., Lujuusopin elementtimenetelmä.

| Completion method and assessment items | Recurrence | Credits |
|---|---|---|
| Method 1 | Recurrence 1: 1. period-2. period | 4 cr |
| ¤LAB/LUT: Course Registration | | 0 cr |
| ¤LAB/LUT: Course Assessment | | 4 cr |
| Method 2 | Recurrence 1: 1. period-2. period | 4 cr |
| ¤LAB/LUT: Course Registration | | 0 cr |
| ¤LAB/LUT: Course Assessment | | 4 cr |

# CT30A3232 Basics of Linux
**CT30A3232 Basics of Linux**

| | |
|---|---|
| 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 |
| | Jouni Ikonen, Responsible teacher |
| Study level | Basic studies |
| Study field | Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs) |

**Prerequisites**

**EN:** Basic computer use skills

**Learning outcomes**

**EN:** Upon completion of the course the student has the transferable skills for workstation use in later courses in computer science. Students are able log in to a Linux machine using both graphical and text based UI, know the basics of Ubuntu operating system, understand the benefits of command line use in Linux, navigate in the file system and manipulate files and their access rights. Additionally the student will know how to use command line I/O redirection, form searches and regular expressions, create shell scripts and use networking programs.

**Content**

**EN:** Installation of a Linux operating system. Virtualisation software. Graphical desktop environments in Linux. Terminal and basic command line use. Command line based text editors, command line programs and program installation. Command line I/O and file system management. Regular expressions, shell scripting, command line network programs and file transfer.

**Additional information**

**EN:** Note
Can't be included in the same degree as CT30A3230 Työaseman käytön perusteet.

Exam examination available only in LUT University campuses.

AI applications may be to understand the material, but the answers to the assignments to be submitted must be achieved through independent work.

The course is related to UN's Sustainable Development Goals (SDG): 9 industry, innovation and infrastructure, 10 reduced inequalities, 11 sustainable cities and communities, 12 responsible consumption and production, 17 partnership for the goals

**Study materials**

**EN:** Just Enough Linux - Learning about Linux one command at a time / Malcolm Maclean (online)
Linux Fundamentals / Paul Cobbaut (online)

Advanced Bash-Scripting Guide / Mendel Cooper (online)

Getting to know Terminal: Linux and command line management, Lappeenrannan teknillinen yliopisto 2015, Annika Ikonen, Timo Hynninen ja Erno Vanhala

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

| | | |
|---|---|---|
| Course  Completion | ------------------------------------------------------------- | 3 cr |
| **Method 2** | Recurrence 1: 1. period-2. period | 3 cr |
| Course  Completion | ------------------------------------------------------------- | 3 cr |

# CT60A5540 Computer networks and Internet
**CT60A5540** Computer networks and Internet

| | |
|---|---|
| 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 |
| | Jouni Ikonen, Responsible teacher |
| | |
| Study level | Intermediate studies |
| Study field | Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs) |

## Prerequisites

**EN:** computer usage skills

## Learning outcomes

**EN:** At the end of the course students will be able to
1. Understands how data transfer is done in internet and knows what kind of components are involved and what are their tasks.

2. Explain why layered network model is needed.

3. Understands how each layer of tcp/ip model works.

## Content

**EN:** In today's connected world everybody should understand in some level how data is transferred in networks and more so in case of people building services used over Internet. Course familiarizes student with knowledge of how Internet works, what kind of components are involved and what kind of protocols are involved. Topics include network topologies, network reference model, Data link layer (multiplexing, Ethernet, WLAN), network layer(switching, internet protocol), transport layer (tcp, udp), application layer (dns, http).

## Additional information

**EN:** You may use AI applications to understand the material, but the answers to the assignments to be submitted must be achieved through independent work.

The course is related to UN's Sustainable Development Goals (SDG): 8 decent work and economic growth, 9 industry, innovation and infrastructure, 10 reduced inequalities, 11 sustainable cities and communities.

## Study materials

**EN:** Computer Networking: A Top-Down Approach, 8th Edn 2022  James F. Kurose and Keith W. Ross

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

# 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 |

# 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 |

# CT30A2910 Introduction to Web Programming
**CT30A2910** Introduction to Web Programming

| | |
|---|---|
| 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 |
| | Erno Vanhala, Responsible teacher |

| Study level | Intermediate studies |
|---|---|
| Study field | Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs) |

**Tweet text**

**EN:** The basic course of web development

**Compulsory prerequisites**

**CT60A0203** Fundamentals of Programming

or

**CT60A0250** Fundamentals of Programming for international programs

**Recommended prerequisites**

**CT60A2412** Object-Oriented Programming

**CT30A3232** Basics of Linux

**Learning outcomes**

**EN:** At the end of the course student is able to: 1) Understand the programming concepts of the web, 2) Knows how to use HTML and CSS to build responsive web pages, 3) Create simple applications with JavaScript to run inside browsers and 4) Familiarize oneself with responsive design and utilization of external APIs

**Content**

**EN:** Web standards: HTTP, HTML, CSS and JavaScript. The browser environment with its Document object model (DOM). Building web sites with commonly used tools.

**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:** Lecture slides and videos.
Other material announced in the lectures.

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

# BJ01A5061 Entrepreneurship and Career Opportunities in Raw Materials Sector

**BJ01A5061 Entrepreneurship and Career Opportunities in Raw Materials Sector**

| | |
|---|---|
| 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, Chemical Engineering 100% |
| Responsible persons | Maria Mamelkina, 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:**

- Recognize entrepreneurship and career opportunities in raw material sector.
- Understand the primary sector of the raw materials value chain (geology, mining, mineral processing, metallurgy, and the environment).
- Apply design thinking tools to enhance the creativity and innovation capacity of engineers.
- Develop skills and competences to improve the mindset of entrepreneurship.

## Content

**EN:** Most of industrial sectors are facing a new era that requires companies to transform their operations, create new business models and foster a digital culture. In this context, the industry is facing a changing talent landscape, necessitating of new skillsets in their workforce. Companies need to ensure that their staffs are properly constituted to support this transformation process.

During the course, entrepreneurship skills as well as innovative thinking for engineers will be trained using the examples from raw material sector. Case studies will bring the understanding of skills and competences of the future workforce and current trends of the industrial revolution.

## Additional information

**EN:** This course can be included in elective studies.

The course is related to UN's Sustainable Development Goals (SDG): 4 quality education, 11 sustainable cities and communities, 12 responsible consumption and production.

## Study materials

**EN:** Lecture notes, articles related to the topics.

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

# CS39A0120 User-centric engineering
**CS39A0120** User-centric engineering

| | |
|---|---|
| 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 Pekkarinen, 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 can:
- demonstrate understanding of the meaning and the role of the user from the idea phase to the implementation phase and use

- identify the diversity of users, various user contexts and related accessibility and inclusion issues

- explain and apply the basics of socio-technical thinking and human-technology interaction

- identify various user involvement methods

### Content

**EN:** user perspectives, user involvement, accessibility and inclusion, socio-technical thinking, human-technology interaction, case examples. Company cooperation: A guest lecture.

### Additional information

**EN:** For the students of BSc in IEM. 100 places in total.
Online lectures. Two face-to-face tutorials with teachers (in groups) on the case exercise. Online seminar.

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

3 good health and well-being, 5 gender equality, 8 decent work and economic growth, 9 industry, innovation and infrastructure, 10 reduced inequalities, 11 sustainable cities and communities, 12 responsible consumption and production, 16 peace, justice and strong institutions, 17 partnership for the goals

## Study materials

**EN:** collection of articles, videos

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

# CS39A0070 Managing digital transformation
**CS39A0070 Managing digital transformation**

| | |
|---|---|
| Curriculum period | 2025-2026 |
| Validity period | 1 Sep 2025-14 Dec 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 | Mira Holopainen, Responsible teacher |
| | Armi Rissanen, Administrative person |
| | Juhani Ukko, Responsible teacher |
| | Minna Saunila, Responsible teacher |
| | |
| 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 will be able to:
-understand what is digital transformation and how its affect companies operations and value creation.

- understand the relationship between strategy and digital transformation

- understand the impact of digital solutions on business processes and human operations.

- define how to strategically approach digital transformation; for example what kind of capabilities, strategic readiness and strategic approaches are needed.

## Content

**EN:** Background and basics of digital transformation. Digitalization as part of a company's strategy. Adoption of digitalization in the organization and evaluating the effects of digitalization.

## 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
17 partnership for the goals

## Study materials

**EN:** Materials will be announced later in Moodle.

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

## CS39A0200 Current themes on IEM
**CS39A0200 Current themes on IEM**

| | |
|---|---|
| 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 | LENS, Industrial Engineering and Management 100% |
| Responsible persons | Tero Rantala, Responsible teacher |
| | 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 most recent themes in the field of IEM that are affecting organizations´ business and operation environments. The course will have changing content and themes that are referring to both practical and theoretical insights from the field of IEM.

### Content

**EN:** The course focus on providing visiting lectures from both practical and academic experts. The themes and topics of the provided lectures demonstrate the recent management and development practices, challenges, and opportunities of industrial organizations.
Core content: Industrial engineering and management, Organizational development, Business development, Leadership, Digital transformation, Sustainable development

### Additional information

**EN:** B.Sc. 2-3
The course is related to UN's Sustainable Development Goals (SDGs):

- industry, innovation and infrastructure

- responsible consumption and production

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

## CS39A0210 Disability & Accessibility of technology, games and society
**CS39A0210 Disability & Accessibility of technology, games and society**

Abbreviation: Disability & Access

| | |
|---|---|
| Curriculum period | 2025-2026 |

| | |
|---|---|
| Validity period | 4 Aug 2025-21 Nov 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 |
| | Lobna Hassan, Responsible teacher |
| Study level | Basic studies |
| Study field | Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction |

## Learning outcomes

**EN:** 1. Draw on disability studies and introduce the students to what disability is (visual, auditory, motor, mobility, and cognitive disability as well as neurodiversity) and how it impacts the life of each disability group,
2. Develop the students' capacities in how to work with people with disabilities,

3. Introduce the students to some of the common approaches to accessibility and universal design and

4. Develop the student's capacity to critically reflect on society and social practices when it comes to inclusion and disability.

## Content

**EN:** NOTE: IMPORTANT NOTE! for medical reasons, the course will most likely be taught online through zoom lecture for Fall 2025
PLEASE ALSO NOTE: attendance for this course is mandatory and you will be dropped from the course if you miss 4 sessions

There are approximately 1 billion individual living with a disability, globally. This is a conservative estimate, and the number is increasing due aging, wars, natural disasters, and so on. The word "disability" is not light and many people, with and without disability, do not relate to it. Yet, how many of us have perfect abilities? Or perfect senses? Do we always have all our abilities and senses or are we all sometimes disabled, for example when we temporarily have a broken arm? How about neurodiversity and emotional disabilities, for example depression or ADHD, how do they impact the people who have it in society? Disability differs between people in terms of severity, impact, effects, and how long it lasts. It is important to understand it since it is something that many of us experience to different degrees. It is also important to know how to interact with people with disability, accommodate them when needed, and how we can foster inclusion wherever we are.

When it comes to technology, it has become a part of everything in our society: online banking, work, socialization, entertainment, healthcare, and so on. Yet, technology is not always accessible to people with disabilities. For example, touch screens on phones are difficult to use for many people with motor disabilities, not all offices are wheelchair accessible, someone with low vision can have trouble with their company's information systems if these systems are inaccessible and a deaf person will find it very hard to participate in zoom calls and remote learning. Yet, people with disabilities are citizens, employees, entrepreneurs, caregivers, and care-receivers. It is important to ensure their equal inclusion in any place that they are and to provide them with equity and access.

This is the function of accessibility, universal design, design for all. These are all similar terms that refer to the same idea of designing technology to be usable with the least effort. Accessibility is a moral obligation and an opportunity for us to challenge our design practices and come up with even better and more usable solutions.

## Additional information

**EN:** This course is related to UN's SDG goals 3 good health and wellbeing, 10 reduced inequalities 10 reduced inequalities, 11 sustainable cities and communities, 12 responsible consumption and production, and 16 peace, justice, and strong institutions

| Completion method and assessment items | Recurrence | Credits |
|---|---|---|
| **Method 1** | Recurrence 1: 1. period-2. period | 6 cr |
| Course completion | | 6 cr |

# CS39A0010 Basics of performance measurement
**CS39A0010** Basics of performance measurement

| | |
|---|---|
| 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 | Tero Rantala, 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:** After completing the course, the student understands the role of performance management and measurement as part of the organizations´ operations management and business development. The student will understand the concepts of both performance management and measurement and can apply them in industrial context. In addition to theoretical understanding about the performance measurement and management, the student will understand the basics of modern performance measurement systems and how industrial digital transformation and contemporary sustainability challenges affect them.

## Content

**EN:** The course focuses on the role of performance management and measurement in digitalizing business environment. The course provides students basic understanding about the different performance measurement systems.
Core content: Performance management practices, performance measurement, performance measurement systems, performance analysis.

## Additional information

**EN:** Will be provided for the students of BSc in IEM Lahti programme.
The course is related to UN's Sustainable Development Goals (SDG):

- industry, innovation and infrastructure

- responsible consumption and production

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

# CS39A0180 Creativity and problem solving

| | |
|---|---|
| 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 | Intermediate studies |
| Study field | Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction |

## Learning outcomes

**EN:** General LOs
To identify the role and place of creativity and problem solving in innovation process or business.

To develop and enhance creative thinking abilities, allowing students to approach problems and challenges with innovative solutions.

### Specific LOs

To equip students with a diverse toolkit of problem solving techniques and strategies applicable to various real world situations.

To identify problems that require inventive solutions, to decompose and analyze complex problems across various fields.

To collaborate and solve complex problems as a team, emphasizing the value of diverse perspectives.

## Content

**EN:** Introduction: inventing and innovating, what is the role and value of creativity in modern business and social institutions. Landscape of ideation methods. The concept of Intellectual property.

Topic 1. Thinking inertia. What, why and how to control it
Topic 2. Root Cause Analysis
Topic 3. Contradiction analysis
Topic 4. Ideal Final Result
Topic 5. Biomimetics
Topic 6. Design thinking
Topic 7. Trends of Technical system evolution

Visit to a company in Lahti region with possible inventive design challenge.

## Additional information

**EN:** Course opened in 2023-24 for the students of BSc in IEM Lahti programme.
Workload breakdown: 6 ECTS = 156 hours of your time:
Lectures ~ 56 hours

Group work ~ 60 hours

Individual work ~ 40 hours

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

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

# CS30A0210 Product Lifecycle Management
**CS30A0210** Product Lifecycle 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 | Armi Rissanen, Administrative person |
| | Ilkka Donoghue, Responsible teacher |
| Study level | Intermediate studies |
| Study field | Fields of education (Ministry of Education and Culture), Engineering, manufacturing and construction |

## Learning outcomes

**EN:** The student can apply the following:
- Product Lifecycle Management (PLM) business concept and its role in business (strategy, business models and enterprise architecture)

- Can recognise the different lifecycle stages and understands their role in the management of the product

- PLM and transformational impact to business processes, data architecture and IT architecture

- Can define a Product Structure from different views and understands the objects that are use to create the product. (e.g. requirements, items)

- Can apply change & release management to manage the product's lifecycle

- The difference between EDM, PDM and PLM concepts and other key IT systems

- The basics of configuration management rules and how they are used to structure and manage products

- Understands the role of a PLM manager and Product Manager

## Content

**EN:** Different views on product and lifecycle management.
PLM Strategy and Concept, PLM part of the Enterprise Architecture

Product architectures, information modelling and modularity.

Product release and change management.

Product Requirement-Functional-Logical-Physical information management.

PLM systems and their functionalities: managing generic products, individual products, items and documents.

Configuration process and configurators.

PLM benefits and implementation.

PLM for sustainability and circularity

PLM Maturity Models for assessment

**Study materials**

**EN:** Lecture materials, articles and parts of relevant books

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

# CS20A0090 Basic course in Supply Chain Management
**CS20A0090** Basic course in Supply Chain 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 | Müge Tetik, 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:** Basic knowledge in industrial management. Basic knowledge in statistical mathematics. Basic skills in spreadsheets.

**Learning outcomes**

**EN:** Upon completing this course, the participants will be able to integrate concepts regarding supply chain management in different production environments, analyze the state of warehouses and design operating methods for warehouse management. Moreover, the participants will have the basic understanding of evaluating the cost effects of logistical decisions.

**Content**

**EN:** The basic concept and scope of supply chain management in a company, basic methods of inventory control and analysis, basics of production control, material management in procurement and distribution, role of demand forecasting in supply chain management, supply chain management problems, supply chain performance measurement and financial impact assessment.

**Additional information**

**EN:** For the students of BSc in IEM programme. Online teaching. Taught in English.
Use of any artificial intelligence applications for any purposes are not allowed.

***

The course is related to UN's Sustainable Development Goals (SDG): decent work and economic growth, responsible consumption and production, industry, innovation and infrastructure, partnership for the goals

**Study materials**

**EN:** Lecture materials; slides, activities, articles, books such as Introduction to Materials Management by Arnold et al. (2020)

## Literature

Introduction to Materials Management

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

# CT60A0250 Fundamentals of Programming for international programs
**CT60A0250** Fundamentals of Programming for international programs

| | |
|---|---|
| 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 |
| | Jouni Järvinen, Responsible teacher |
| | Janne Parkkila, Responsible teacher |
| Study level | Basic studies |
| Study field | Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs) |

## Learning outcomes

**EN:** In this course, students learn essential programming concepts independently according to the listed topics in the Content section.

Each week include exercise tasks that students solve independently. The tasks must be done according to coding style and descriptions given on the lectures.
The second period of the course features a project work, which is a larger programming task utilizing the skills covered in this course. The project work must be done independently.

The course concludes with an exam where students are required to program tasks independently. The tasks are demanding, and passing the course requires acquiring a moderate level of programming skills.

## Content

**EN:** The topics of the course include but are not limited to:

- Week 1: Data types, variables, inputting and outputting
- Week 2: More on strings and printing
- Week 3: Conditional statements and Boolean logic
- Week 4: Loops in programming
- Week 5: Functions
- Week 6: Classes, lists & matrices
- Week 7: Dealing with text files
- Week 8: Handling errors and exceptions + **project work** starts
- Week 9: Modules
- Week 10: Data, Dictionaries, CSV, JSON & own modules
- Week 11: Tuples, sets & NumPy. Installing external libraries using pip

- Week 12: Data from internet, web user interfaces, video games
- Week 13: Recursive functions and algorithm design & analysis
- Week 14: Instructions for exam

**Additional information**

**EN:**

- Only for students of Bachelor's programmes in English.
- Overlaps with course CT60A0203 Ohjelmoinnin perusteet (and earlier versions). These courses can not be included in the same degree in LUT.
- The course is related to UN's Sustainable Development Goals (SDG): 8 decent work and economic growth, 9 industry, innovation and infrastructure, 12 responsible consumption and production.

**Study materials**

**EN:** Lecture slides and videos available in Moodle. Weekly exercises are submitted to CodeGrade. EXAM examination

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

# CT60A4500 Fundamentals of Software Testing (Lahti)
CT60A4500 Fundamentals of Software Testing (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 |
| | Azeem Akbar, Responsible teacher |
| Study level | Intermediate studies |
| Study field | Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs) |

**Tweet text**

**EN:** The fundamental course on software testing

**Prerequisites**

**EN:** Basic knowledge and skills in programming and in software engineering, e.g. courses like CT60A0201 Introduction to programming, CT60A2411 Object-oriented programming and CT60A4002 Software Engineering.

**Compulsory prerequisites**

**CT60A2412** Object-Oriented Programming

**Recommended prerequisites**

**CT60A4002** Software Engineering

**Equivalences to other studies**

CT60A4160 Fundamentals of Software Testing

**Learning outcomes**

**EN:** At the end of the course students will be able to
1. explain the basic terms and concepts in software testing

2. do software testing in unit, integration, and system levels

3. use basic testing tools in testing and automate testing tasks

4. work in a testing team as a junior software tester.

**Content**

**EN:** Software testing techniques, levels, automation, tools, working as a tester in a software testing team.

**Additional information**

**EN:** Full digi***The course is related to UN's Sustainable Development Goals (SDG):9 industry, innovation and infrastructure, 10 reduced inequalities

**Study materials**

**EN:** Ohjelmistotestauksen käsikirja, Jussi Pekka Kasurinen, Docendo Oy, 2013. Purchasing the book is not necessary to complete the course, other materials announced at the lectures.

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

# CT60A4050 Fundamentals of Software Engineering
**CT60A4050** Fundamentals of Software Engineering

| | |
| --- | --- |
| 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) |

**Equivalences to other studies**

CT60A4002 Software Engineering

**Learning outcomes**

**EN:** After the course, the student
1. is able to describe the different areas of software engineering using the basic concepts of the industry

2. has the capability to act in different roles in the various phases of the software engineering process

3. is able to apply different software engineering methods and tools

**Content**

**EN:** Introduction, the role of software engineering in different organizations, software engineering process, requirement engineering, modelling, UML, architectures, process improvement, project management, GDPR, ethics.

**Additional information**

**EN:** The English version of this course will be lectured at Lahti campus, the Finnish version at the Lappeenranta campus.
***

The course is related to UN's Sustainable Development Goals (SDG): 8 decent work and economic growth, 9 industry, innovation and infrastructure, 12 responsible consumption and production.

**Study materials**

**EN:** Materials announced in the lectures.
Basic reference is Ian Sommerville, Software Engineering, 10th edition, Pearson International, 2015.

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

# CT60A5511 Software Quality Management

**CT60A5511** Software Quality Management

Abbreviation: CT00CT38

| | |
| --- | --- |
| 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 |
| | Azeem Akbar, Responsible teacher |
| Study level | Intermediate studies |
| Study field | Fields of education (Ministry of Education and Culture), Information and Communication Technologies (ICTs) |

**Prerequisites**

**EN:** CT60A4160 Ohjelmistotestauksen periaatteet, CT60A0202 Ohjelmoinnin ja data-analytiikan perusteet

**Learning outcomes**

**EN:** By completing the course the student knows the most common quality assurance (QA) models, measurements and tools applied in the software processes. The student has the capability of doing QA tasks independently, or design and implement quality control tools to measure quality as a part of larger process organization. Student knows how quality assurance is done and how the QA and software development are associated.

## Content

**EN:** Software quality-related models and measurements. Software quality and quality control-related tools and the common documents. Software quality assurance as an organizational activity, improvement of software quality. Quality-related standards and certifications, Quality assurance and quality control in practice.

## Additional information

**EN:** Continuous enrollment. The course deliverables have to be submitted for grading within 50 days from starting the course.

## Study materials

**EN:** Galin, Daniel. Software quality assurance: from theory to implementation. Pearson Education India, 2004. Kasurinen, Jussi Pekka. Ohjelmistotestauksen käsikirja. Jyväskylä: Docendo, 2013.Other material provided by the course website.

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

# VA10A1500 Introduction to Entrepreneurship
**VA10A1500** Johdatus yrittäjyyteen

| | |
|---|---|
| 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 | LBS, Business Administration 100% |
| Responsible persons | Satu Vesin, Responsible teacher |
| | Markku Ikävalko, 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

## Prerequisites

**EN:** The course includes a compulsory preliminary assignment that has to be completed successfully by a pre-defined date.

## Learning outcomes

**EN:** During the course, the student will learn to understand the significance of an entrepreneurial team, and will form an understanding of entrepreneurship as a creative activity that happens in the form of business.
After completing the course, the student will be able to:
- define business-related principles, possibilities and challenges

- plan business initiating from customer needs, value creation, testing and agility
- interpret business-related substance areas where competence is needed

## Content

**EN:** The decision to become an entrepreneur:
- an introduction to entrepreneurship
Creating viable business ideas:
- creating business opportunities
- preliminary research
- industry analysis
- business plan
From an idea to an entrepreneurial firm:
- building a team
- analysing start-up strengths and weaknesses from the funding perspective
- ethical and legal issues when starting a company
- writing a business plan and constructing a story
- attracting funding
Managing an entrepreneurial firm and creating growth:
- marketing
- Understanding VC (Venture Capital) operation
- IPRs (Intellectual Property Rights)
- The challenges of growth and managing growth
- growth strategies
- operation forms

## Additional information

**EN:** Note
Only for students of technology and social sciences.

Please note that the students of LUT Master's programme in Entrepreneurship can NOT include this course in their Minor nor degree.

The latest information about the course is updated and published on the course platform at www.lito.fi.

1. The course will run from 2 October to 1 December 2025 (Weeks 40–49). There is a pre-assignment in week 38.

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 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:** Barringer, B. ; Ireland. D. (2012). Entrepreneurship: Successfully Launching New Ventures, 4th Edition. Prentice Hall. **Later editions can also be used, but please note that the page numbers for the later versions vary.**

| Completion method and assessment items | Recurrence | Credits |
|---|---|---|
| **Method 1** | Recurrence 1: 1. period-2. 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 deci-

sion-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 | 5 cr |
| | Recurrence 2: 4. period, 3. period | |
| | Recurrence 3: 4. period | |
| 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 |

# K200CP86 Finnish for Work 3
**K200CP86** Finnish for Work 3

Abbreviation: K200CP86

| | |
|---|---|
| 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

**Learning outcomes**

**EN:** Proficiency level B1 The students will be able to - communicate in informal and formal discussions at work - communicate in customer service and complaint situations - compose work-related e-mail messages.

**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 |

# 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 |

# 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 |

# K200DE18 Suomi with Love 2
**K200DE18** Suomi with Love 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 | LAB, language 100% |
| Responsible persons | |
| Study level | Basic studies |
| Study field | Fields of education (Ministry of Education and Culture), Humanities |

# 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 |

## 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 |

# 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 |

# KE00CQ81 Effective Presentations
KE00CQ81 Effective Presentations

Abbreviation: KE00CQ81

| | |
|---|---|
| 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 | 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

**Learning outcomes**

**EN:** Proficiency level: B2 Students are able to - plan, prepare and execute a persuasive and engaging presentation - use intonation and stress to amplify their message - use various delivery techniques such as pacing, chunking and repetition - design and use visual materials effectively in their presentation.

**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 |

# KE00BZ82 Professional Meetings and Discussions
**KE00BZ82** Professional Meetings and Discussions

Abbreviation: KE00BZ82

| | |
|---|---|
| Curriculum period | 2025-2026 |
| Validity period | since 1 Aug 2025 |
| Credits | 4 cr |
| Languages | English |
| Grading scale | Pass-Fail |
| University | Lappeenranta-Lahti University of Technology LUT |
| Responsible organisation | LAB, language 100% |
| Responsible person | Mohammad Etedali, 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:**

**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 |

# 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 |

# 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 |

# KD00CH42 German for Work 1
**KD00CH42** Työelämän saksaa 1

Abbreviation: KD00CH42

| | |
|---|---|
| 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 speech and texts related to occupations, work and job search - are able to tell about themselves and their skills - are able communicate in basic situations related to job search CEFR 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 |

## 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 |

## KD00BX51 Business German
**KD00BX51** Wirtschaftsdeutsch

Abbreviation: KD00BX51

| | |
|---|---|
| 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: B1 The student is able to tell in German about a company, its activities and corporate finances

**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 |

# 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 |

## 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 |

# 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 |

# 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 |

# 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 |

# KE00CH94 Diversity Management and Global Citizenship
KE00CH94 Diversity Management and Global Citizenship

Abbreviation: KE00CH94

| | |
|---|---|
| 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

**Learning outcomes**

**EN:** The student is able to: - understand different concepts of diversity and inclusion in the workplace and their impact on organizations - understand cultural differences in management and leadership - recognize the benefits of managing diversity in organizations - lead diverse individuals and teams - understand global impacts of their own actions and the importance of a global mindset in today's world.

**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 |