VENTSPILS UNIVERSITY OF APPLIED SCIENCES

EDUCATION FOR TOMORROW

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GENERAL INFORMATION

Name and Address:

Ventspils University of Applied Sciences
Inženieru iela 101, Ventspils, LV-3601, Latvia
Erasmus Code: LV VENTSPI 01

Description:

Autonomous state university of applied sciences and scientific institution. Basic activities involve scientific research and university studies.

Academic authorities:

Rector – PhD. Kārlis Krēsliņš
Acting Vice Rector for Studies – Una Libkovska
Dean of Faculty of Information Technologies – Dr. phys. Vairis Caune
Dean of Faculty of Economics and Management – PhD. Liene Resele
Dean of Faculty of Translation Studies – Artūrs Viļums
Erasmus+ Coordinator – Līga Koloda

Academic calendar:

For Erasmus+ students the AUTUMN study period lasts from **01.09.2020 to 31.01.2021** and the SPRING study period lasts from **08.02.2021 to 27.06.2021**.

List of Bachelor and Master Study programmes:

- Bachelor study programme "Languages and Intercultural Communication" (3 years)
- Bachelor study programme "Business Administration" (3 years)
- Bachelor study programme "Translation" (4 years)
- Bachelor study programme "Computer Science" (3 years)
- Bachelor study programme "Electronics Engineering" (4 years)

Admission requirements and application procedure for Erasmus+ studies:

Nomination and Application procedure:
Exchange students should first get approval from their home university for their planned exchange.

Partner universities ought to send their Erasmus+ nominees with the necessary information:

- name and surname (as in passport);
- email address;
- field of study;
- study level (BA, MA, PhD) and the year the student is currently rolled in (2nd, 3rd, 4th etc.);
- nomination period (Autumn, Spring or the whole year);
- date of birth.

to the following email: erasmus@venta.lv

After receiving the home university's confirmation, students can apply by filling in the online Application form: https://application.venta.lv/erasmus

Student's online application must include these documents in English:

- Transcript of records (from home university, in English);
- Nomination letter from home university (if nomination is not sent by email before);
- Learning agreement (signed by the student and the sending university);
- Copy of passport or ID.

Institutional credit framework:

The University of Applied Sciences employs a system of credit points (CP). CP correspond to ECTS in the following manner – **1 credit point** is equal to **1.5 ECTS.**

Application procedures:

https://venta.lv/en/join-us/

FACULTY OF ECONOMICS AND MANAGEMENT

Faculty of Economics and Management (FEM) study programmes have been developed to meet the requirements of the labour market both in Latvia and elsewhere in Europe. To maintain high quality studies, the university attracts the best scholars from Latvia and abroad (Switzerland, Belgium, Italy, Finland, Belarus, etc.). To prepare the students for practical work in entrepreneurship and business administration as thoroughly as possible, a significant part of the study process at FEM takes place beyond the classroom – in practical study sessions, various group assignments, and business games. Students can gain practical business experience through the external infrastructure: Ventspils High Technology Park (VHTP), Ventspils Business Support Centre, Ventspils University of Applied Sciences scientific institution "Ventspils International Radio Astronomy Centre", etc.

FACULTY OF INFORMATION TECHNOLOGIES

The faculty possesses computer and electronics laboratories with cutting-edge equipment. Labour market-oriented study programmes prepare qualified professionals. Guest lecturers from Lithuania, Belarus, Germany, etc. enrich the study process in the programmes. During their studies, students can develop independent projects, as well as become a part of the leading scientific institutions in Latvia – "Ventspils International Radio Astronomy Centre" and "Smart Technology Research Centre".

FACULTY OF TRANSLATION STUDIES

The study programmes of the Faculty of Translation Studies (FTS) are contemporary, dynamic and versatile, an important feature is work environment-based studies and the use of up-to-date translation technologies. The academic staff consists of highly qualified language experts, experienced lecturers and practising translators and interpreters.

The professional study programmes of FTS provide the opportunity to obtain a bachelor's or master's degree, both interpreters and translator's qualification in several working languages of the European Union. Thus, after studies in the Bachelor study programme "Translation", it is possible to acquire both the qualification of an interpreter (oral) land translation (written).
During the studies, special equipment can be used to develop oral and written translation skills, i.e., linguistics room, interpreting booths, written translation software, etc.

STUDY PLANS - Autumn Semester (2020/2021)

Autumn semester in "Business Administration"

Courses for AUTUMN semester of academic year 2020/2021 of academic Bachelor study programme "Business Administration" *

Year 1

Course title	Course code	ECTS
Mathematics I	Mate1019	3
Microeconomics	Ekon1011	4.5
Statistics	Ekon1014	3
Psychology	Psih3001	3
Aspects of Intercultural Communication I	SDSK1009	3
The English Language: Communication Aspects	Citi1031	6
Introduction into Theories of Public Relations	Soci1003	6
E-Management	VadZ1010	3
Intercultural Aspects of the Latvian language	-	1.5

Year 2

Course title	Course code	ECTS
Accounting	VadZ2021	6
Entrepreneurship	VadZ2020	4.5
EU Politics, Economy and Constitution	SDSK1013	3
Financial Mathematics	Ekon2006	3
Project Management	VadZ2018	3
Office Management	VadZ3021	3
Sustainability of Society and "Green" Thinking	SDSK3004	3
Business Modelling	VadZ1042	3
E-Management	VadZ1010**	3

** The course did not take place in 2019/2020 autumn semester

Year 3

Course title	Course code	ECTS
Strategic Management	VadZ3035	4.5
Information and Business Processes	VadZ3036	6
Management Theories	VadZ5001	3
Academic Writing	Citi3026	3

Media Communication in a Multicultural Environment	KomZ3002	6
Research Methods	Citi5001	3
Organizational Behavior	Jauns	3

*The courses are subject to change

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Autumn semester in “Languages and Intercultural Communication”

Courses for AUTUMN semester of academic year 2020/2021 of academic Bachelor study programme “Languages and Intercultural Communication” *

Year 1

Course title	Course code	ECTS
Introduction into studies	SDSK1009	6
Russian as the First Foreign Language I	Citi1013	6
Introduction into Theories of Public Relations	Soci1003	6
Aspects of Latvian in Intercultural Communication I	Citi1014	6
The English Language: Communication Aspects	Citi1031	6

Year 2

Course title	Course code	ECTS
Cultural Studies	MākZ1001	6
Language Contrasts in Cultural Perspectives	SDSK1010	3
Fundamentals of Spanish I	Valo2008	6
Methodology of Applied Research in Enterprises and Institutions	Citi2020	3
EU Politics and Economy	SDSK1013	3

Year 3

Course title	Course code	ECTS
Sustainability of Society and “Green” Thinking	SDSK3004	3
Academic Writing	Citi3016	3
Media Communication in a Multicultural Environment	KomZ3001	6
Office Management	VadZ3021	3
Project Management	VadZ2018	3

*The courses are subject to change

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Autumn semester in “Translation”

Courses for AUTUMN semester of academic year 2020/2021 of professional Bachelor study programme “Translation” *

Year 1

Course title	Course code	ECTS
Introduction into studies	Citi1012	6
Introduction into Theories of Public Relations	Soci1003	6
The English Language: Communication Aspects	Citi1031	6
Aspect of Latvian in Intercultural Communication	Citi1039	6
Introduction in Linguistics	Valo1028	3
English Phonetics, EN	Valo1008	3
General Communication in English I	Valo1009	3
Lexicostylistic English Text Analysis: Theory and Application, EN	Valo1012	3
English Normative Grammar I: The Theory of Morphology and its Application	Valo1011	6
Fundamentals of Written Translation I, EN-RU	Valo1070	6
Modern Russian I (RU)	Valo1014	3
Modern German I (DE)	Valo1015	3
Communication in German	Valo1047	9
German Morphology (DE)	Valo1003	9
German Orthography (DE)	Valo1002	3
German in Business Communication I (no previous German knowledge is needed)	Valo2029	6

*The courses are subject to change

Year 2

Course title	Course code	ECTS
English Written Practice I (Written Communication in English I)	Valo2006	1.5
Business English I: Management and Labour Market in the EU, EN	SDSK2007	3

Contrastive Linguistics EN-RU	Valo2054	3
Area Studies I: United Kingdom, EN	SDSK2006	3
Business Russian (RU)	Valo2039	3
Business German (DE)	Valo2038	3
Contemporary German II (B1)	Valo2057	6
Written Translation III: Macroeconomics and Entrepreneurship in EU Member States, EN-RU	Citi2043	6
Fundamentals of French I / Fundamentals of Spanish I	Valo2007/ Valo2008	6
Introduction into Computer-Aided Translation (EN)]	SDSK2016	3

Year 3

Course title	**Course code**	**ECTS**
Ethnolinguistics and Translation Aspects	Valo3037	1.5
English Stylistics	Valo2013	3
Introduction to terminology I, RU	Valo3038	3
Written Translation: Marketing and Advertising DE-RU	Valo3039	3
Fundamentals of Domain-Specific Text Translation, DE-RU	Valo2056	3
Written Translation V: Environmental Issues, EN-RU	VidZ3002	3
Problems of Translating Culture-Specific Items, EN-RU-EN	Valo3040	3
Consecutive Interpreting I: Theory and Application, EN-RU	Valo3041	6
Corpora in Translation	Jauns	1.5
Business French I	Valo3025	3
Business Spanish I	Valo3026	3
Contrastive Linguistics	Valo2005	3
Interpersonal Psychology	Psih1001	3

*The courses are subject to change

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Autumn semester in "Computer Science"

Courses for AUTUMN semester of academic year 2020/2021 of academic Bachelor study programme "Computer Science" *

Year 1

Course title	Course code	ECTS
Mathematical Analysis I	Mate1001	6
Linear Algebra and Analytical Geometry I	Mate1003	3
Mathematical Logic	Mate1005	3
Basics of Computer Science	DziT1001	6
English I	Citi1005	3
Fundamentals of the Latvian Language I	-	3
Physics I	Fizi1002	3
Computer Systems Hardware and Architecture	DziT1003	3
Labour Safety and Ergonomics	SDSK2001	3

Year 2

Course title	Course code	ECTS
Differential Equations (must have obtained: Mathematical Analysis I, Mathematical Analysis II)	Mate2005	3
Theory of Algorithms (must have obtained: Mathematics, Foundations of Computer Science and Linear Algebra and Analytical Geometry)	Mate2002	3
Probability Theory and Mathematical Statistics	Mate2001	3
Object Oriented Programming (must have obtained: C or C++ programming language)	DziT2006	6
Business Basics	VadZ3001	3
Electronics	ETel2008	6
Local Area Networks Designing and Administration	DziT2007	6

*The courses are subject to change

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Autumn semester in “Electronics Engineering”

Courses for AUTUMN semester of academic year 2020/2021 of academic Bachelor study programme “Electronics Engineering” *

Year 1

Course title	Course code	ECTS
Mathematical Analysis I	Mate1001	6
Linear Algebra and Analytical Geometry I	Mate1003	3
Mechanics	Meha1001	4.5
Digital Electronics (Combination of Basics of Digital Electronics and Digital Logics and Computer Architecture)	ETel3010	6
Labour Safety and Ergonomics	SDSK2001	3
English for Engineers I (obligatory for all ERASMUS students unless some certificate (TOEFL or similar) is provided)	Valo3763	3

Year 2

Course title	Course code	ECTS
Optics and Optoelectronics	Fizi2002	4.5
Circuit Theory II (must have obtained: Higher Mathematics, Electromagnetism, Circuit Theory I)	ETel2009	6
Programming basics for microcontrollers I (must have obtained: Basics of Digital Electronics, Programming, Digital electronics and Computer Architecture, only for Erasmus students with prior knowledge)	ETel3011	3
Analog Devices (must have obtained: Electricity and Magnetism, Semiconductor Devices)	ETel2005	6
Programming in C II (must have obtained: Programming I, only for Erasmus students with prior knowledge)	DatZ2006	3

Year 3

Course title	Course code	ECTS
Numerical Methods (must have obtained: Higher Mathematics)	Mate3001	3
Business Basics	VadZ3001	3

Data transmission technology and devices (must have obtained: Mathematical Analysis, Analogue Devices, Signal Theory and Signal Processing, Antenna Theory, Digital Electronics and Computer Architecture)	ETeh3001	6

*The courses are subject to change

Courses for AUTUMN semester of academic year 2020/2021 of professional Master study programme "Electronics" *

Year 1

Course title	**Course code**	**ECTS**
Antenna Engineering	ETel1005	6
RF and Microwave System Design	ETel1006	6
Automatic Control Systems	ETel1009	6

*The courses are subject to change

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STUDY PLANS - Spring semester (2020/2021)

Spring semester in “Business Administration”

Courses for SPRING semester of academic year 2020/2021 of academic Bachelor study programme “Business Administration” *

Year 1

Course title	Course code	ECTS
Mathematics II	Mate1018	3
Econometrics	Ekon1010	6
Decision Making	VadZ2008	3
Macroeconomics	Ekon1015	4.5
International Business Law	JurZ2005	3
The English Language: Communication Aspects II	KomZ1004	6
Business Ethics	Filz3001	3
Aspects of Intercultural Communication II	SDSK1014	3

Year 2

Course title	Course code	ECTS
Management Accounting	VadZ2024	6
Financial Economics	Ekon2017	4.5
Marketing	VadZ2025	6
Human Resources in Multicultural Environment	VadZ2026	6
International Reporting Standards	Ekon2018	3

Year 3

Course title	Course code	ECTS
Economics and Informatics	DatZ3004	6
Diplomatic Protocol	Citi3004	6
Civil Protection	Citi2039	1.5

*The courses are subject to change

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Spring semester in “Languages and Intercultural Communication”

Courses for SPRING semester of academic year 2020/2021 of academic Bachelor study programme “Languages and Intercultural Communication” *

Year 1

Course title	Course code	ECTS
Aspects of Intercultural Communication II	SDSK1014	3
Economic and Political Aspects of Entrepreneurship	SDSK1020	3
Russian as the First Foreign Language II	Valo1054	6
Language as a Means of Business Communication II	SDSK1022	3
Public Speaking and Presentation Skills	Citi2046	3
Aspect of Latvian in Intercultural Communication II	Valo1053	6
The English Language: Communication Aspects II	KomZ1004	6
Introduction into Computer Sciences	DziT1014	3
French / Spanish as the Second Foreign Language I	Valo1055/ Valo1056	6

Year 2

Course title	Course code	ECTS
Human Resources in Multicultural Environment	VadZ2026	6
French as the Second Foreign Language III	Valo2043	6
Spanish as the Second Foreign Language III	Valo3033	6
German in Business Communication II	Valo2044	6
Russian in Business Communication II	Valo2045	6
International Business Law	Jurz2005	3
Business Ethics	Filz3001	3
Decision Making	VadZ2008	3

Year 3

Course title	Course code	ECTS
Diplomatic Protocol	Citi3004	6

Civil Protection	Citi2039	1.5

*The courses are subject to change

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Spring semester in “Translation”

Courses for SPRING semester of academic year 2020/2021 of professional Bachelor study programme “Translation” *

Year 1

Course title	**Course code**	**ECTS**
Development Tendencies of Contemporary Russian II, RU	Valo2050	3
Introduction into Linguistics, EN	Valo1028	3
Economic and Political Aspect of Entrepreneurship, EN	SDSK1020	3
General Communication II: English Rhetoric (Spoken communication)	SDKS1019/ 2057	3
Linguostylistic Analysis of Text in English II	Valo1034	3
English Normative Grammar II: The Theory of Syntax and its Application	Valo1029	3
Contemporary German II (A2)	Valo2051	6
Norms of Orthography in Translation, RU	Valo2052	3
Written Translation II: Informative and Publicistic Texts, EN-RU	Valo2053	6
Lexicostylistic Analysis of Text in English II	Valo1034	3
Contemporary Russian II: Situational Models	Valo1031	3
Modern German II: Situational Models	Valo1042	3
Production of Writing (in German)	Valo1049	3
Independent studies	Citi1022	3
Linguistic aspects of text analysis, DE	Valo1044	3
German Syntax	Valo1020	3
Regional and Cultural Studies I: Germany	Valo1060	6

*The courses are subject to change

Year 2

Course title	Course code	ECTS
English Written Practice II	Valo2019	1.5
Translation Theory	Citi2018	3
Business English II: Business and Finance in EU	SDSK2013	3

American Studies	Valo2014	3
Spanish II	Valo2018	6
Basic Business French II	Valo2016	6
Stylistics of the German Language	Valo2011	3

Year 3

Course title	**Course code**	**ECTS**
Stylistics of the Russian Language, RU	Valo3014	3
Stylistics of the German Language II	Valo3024	3
Research Methods and Independent Studies	SDSK3008	3
Business French II	Valo3022	3
Business Spanish II	Valo3023	3

*The courses are subject to change

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Spring semester in "Computer Science"

Courses for SPRING semester of academic year 2020/2021 of academic Bachelor study programme "Computer Science" *

Year 1

Course title	Course code	ECTS
Mathematical Analysis II (must have obtained: Mathematical Analysis I)	Mate1010	3
Linear Algebra and Analytical Geometry II (must have obtained: Linear Algebra and Analytic Geometry I)	Mate1011	3
Discrete Mathematics	Mate1012	3
Programming	DziT1009	6
English II	Citi1016	3
Physics II (must have obtained: Physics I, Linear Algebra and Analytic Geometry, Calculus)	Fizi1003	3

Year 2

Course title	Course code	ECTS
Data Structures and Algorithms (must have obtained: C++)	DziT2005	3
Optimization Methods (must have obtained: at least one programming language)	Mate2006	3
JAVA Programming (must have obtained: Object Oriented Programming)	DziT2014	6
Information Systems Analysis and Design	DziT2015	6
Fundamentals of Economics	Ekon2011	3
Network Operating Systems (must have obtained: Linux OS proficiency, Local Area Networks)	DziT2016	3
Modeling of Chaotic Processes (must have obtained: Differential Equations)	DziT3006	3
Civil Protection	Citi2039	1.5
Sustainability of Society and "Green" Thinking	Jauns	1.5

Year 3

Course title	Course code	ECTS
Information Systems Security (must have obtained: basic knowledge of Computer Networking and System Administration, Fundamentals of Logical Operations)	DziT2017	3
Computer Design	DatZ1001	3
AB Suite Programming Environment	DziT3017	6
Web Page Programming	DatZ3005	6

*The courses are subject to change

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Spring semester in “Electronics Engineering”

Courses for SPRING semester of academic year 2020/2021 of academic Bachelor study programme “Electronics Engineering” *

Year 1

Course title	Course code	ECTS
Mathematical Analysis II (must have obtained: Mathematical Analysis I)	Mate1002	6
Linear Algebra and Analytical Geometry II (must have obtained: Linear Algebra and Analytic Geometry I)	Mate1004	3
Electricity and Magnetism (must have obtained: Linear Algebra and Analytic Geometry, Calculus)	Fizi1001	6
Semiconductor Electronics	ETel1002	4.5
Circuit Theory I	ETel1013	3
Programming in C I	DatZ1007	3
English for Electronics II (obligatory for all ERASMUS students unless certificate (TOEFL or similar) is provided)	DatZ3009	3

Year 2

Course title	Course code	ECTS
Signal Theory and Signal Processing II (must have obtained the first part of the course)	DziT3002	3
Object Oriented Programming	DziT2006	6
Computer Aided PCB Design	ETel2012	3
Electronics Manufacturing Technology. Electronic Circuit Design	ETel2007	3
Modelling of Chaotic Processes in Electronic Systems	DziT3005	3
Introduction to Electrodynamics and Antenna Theory	ETel3009	6

Year 3

Course title	Course code	ECTS

Digital Signal Processors (must have obtained: Calculus, Linear Algebra, Circuit Theory, Signal Theory and Analysis, Programming)	DziT3003	4.5
Standards and Technical Norms	ETel1003	3

*The courses are subject to change

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COURSE DESCRIPTIONS

Business Correspondence

(Lietišķā sarakste)

Author	
LAIS course code	
Form of evaluation	Test
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	
The number of lectures	
The number of practical classes	
Prerequisites	N/A
Part of the study programme	General education study courses

Study course objective

The study course objective is to provide knowledge of business document types, its execution and role in enterprise governance.

Study results

Having acquired the study course, a student:

- Is capable of executing relevant documents independently
- Is able to administer different types of documents.

Organization mode of students` individual work

The independent work of students includess:

- Output of individual document portfolio.

Evaluation of study results

The end result is made of:

- Test 90%
- Portfolio 10%

Study course outline

No.	Title of the topic
1.	Structuring content of text.
2.	Language and style.
3.	E-mail.
4.	Daily business documents (references and responses, quotations, estimates and offers, orders and their execution, bill issue and settlement of accounts, payment request letter, credit and clarification on status, typical business transaction – correspondence and documentation).
5.	Creative persuasive documents (complaints, their consideration, courtesy letter, notifications and proposals, declarations, announcements and informative materials,

No.	Title of the topic
	circular letter, sales and offer letters of goods, promotional material, personnel, meeting documentation, general administrative correspondence).
6.	Classified business correspondence (representations, international trade, activity of banks, transport, insurance).

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International Business and International Organizations

(Starptautiskā uzņēmējdarbība un starptautiskās organizācijas)

Author	Dr. paed., MBA Vita Balama
LAIS course code	
Form of evaluation	Exam
Academic credit points (ECTS credit points)	6 ECTS
The total number of contact lessons	16
The number of lectures	16
The number of practical classes	0
Prerequisites	N/A
Part of the study programme	General education study courses

Study course objective

-

Study results

-

Organization mode of students` individual work

-

Evaluation of study results

The end result is made of:

- Attendance (10%)
- research work on chosen theme: preparation of the report in written form (10%)
- public defense of it (20%)
- the exam (70%)

Study course outline

No.	Title of the topic
1.	The nature of international business
2.	Cultural influences
3.	The international economic environment
4.	Competition, privatisation and deregulation
5.	The international political and legal environments
6.	The multinational company
7.	Direct foreign investment
8.	International technology transfer
9.	International logistics and distribution
10.	Organisation of international business
11.	International operations management
12.	International financial management
13.	International marketing
14.	International human resources management

No.	Title of the topic
15.	Strategies for internatioanl business
16.	Planning and control of international operations

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Language Contrasts in Cultural Perspectives

(Valodu sastatījums kultūraspektā)

Author	doc. Dr. philol. Guntars Dreijers
LAIS course code	SDSK1010
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	Upper-intermediate – advanced level of English
Part of the study programme	General education study courses

Study course objective

The study course objective is to link language and culture. Linguistic practices are also seen as cultural practices because both influence each other. Students will learn to distinguish among various aspects of linguoculture and to relate them to their own languages and cultures.

Study results

Having acquired the study course, a student:

Organization mode of students' individual work

The independent work of students include:

Evaluation of study results

The end result is made of:

- Active and regular participation in classes
- Participation in discussions
- Timely done home assignments
- Successfully passed examination covering both theoretical and practical aspects

Study course outline

No.	Title of the topic
1.	Contact Linguistics
2.	Semiotics of Culture; Linguistic Practices in Cultural Artefacts
3.	Lexis; contrastive aspects of lexis; Methodological Apparatus of Doing Contrastive Analysis/ Phraseology/ Idioms
4.	Realia; Translatability; Transferrability of Cultures; Language and Cultural Identity
5.	Language of Politics; Language of Humour; Euphemisms across Cultures; Language of Labelling - Stereotypes
6.	Intralingual Varieties; Ethnolinguistics, Dialects, Accents
7.	Language Choice and Sociolinguistic Patterns across Cultures

No.	Title of the topic
8.	Linguocultural Capital of Advertising
9.	Texts as Artefacts
10.	Linguoculture of myths and legends
11.	Intertextuality

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Decision Making

(Lēmumu pieņemšana)

Author	Ph.D. Kārlis Krēsliņš
LAIS course code	VadZ2008
Form of evaluation	Test
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	16
The number of practical classes	
Prerequisites	N/A
Part of the study programme	General education study courses

Study course objective
The study course objective is to introduce students with theoretical and practical aspects of decision making in politics, economics and business.

Study results
Having acquired the study course, a student:

- Is capable of performing the decision making process
- Is able to apply different decision making methods
- Is able to use different decision making models

Organization mode of students` individual work
The independent work of students includess:

- Practical tasks.

Evaluation of study results
The end result is made of:

- Test (100%).

Study course outline

No.	Title of the topic
1.	Classification of decisions
2.	Decision-making process (definition of problem, desired results, generation of possible alternatives, expected results).
3.	Decision and action, evaluation of effects.Decision-making levels and styles.
4.	Use of models in decision making process.

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Diplomatic Protocol

(Diplomātiskais protokols)

Author	Dr. paed. doc. Vita Balama, Dr. philol. doc. Guntars Dreijers
LAIS course code	Citi3004
Form of evaluation	Exam
Academic credit points (ECTS credit points)	6 ECTS
The total number of contact lessons	32
The number of lectures	16
The number of practical classes	16
Prerequisites	
Part of the study programme	General education study courses

Study course objective
The study course objective is to introduce with latest worldwide tendencies of culture diplomacy and political diplomacy.

Study results
Having acquired the study course, a student:

- Is able to read analytical articles about the current tendencies of culture diplomacy and political diplomacy in the world,
- Is able to notice and recognize as well as analyse the basic modules of culture diplomacy, applied etiquette, political diplomacy both theoretically and practically,
- Has gained knowledge on culture diplomatic modules of international ehavior and relationship.

Organization mode of students' individual work
The independent work of students include:

- reading analytical articles on the tendencies of culture diplomacy and political diplomacy,
- preparation of the debates on certain diplomatic themes in culture and politics diplomacy,
- preparation the report on actual issues of culture diplomacy and/or political diplomacy,
- analysis of video materials about the practical cases of political and cultural diplomacy.

Evaluation of study results
The end result is made of:

- Active participation in the lectures
- Hometasks prepared on time

- Successfully passed final exam

Study course outline

No.	Title of the topic
12.	Clarify the following terms of international diplomacy - affirmative action, equal opportunities, natural rights, negative rights, positive rights, privacy (Guntars Dreijers)
13.	Practical cases of political diplomacy (Guntars Dreijers)
14.	Beginnings of the political diplomacy: Aristotle, Plato, also Sun Tzu, Clausewitz, Machiavelli (Guntars Dreijers)
15.	International Organizations (Guntars Dreijers)
16.	Debates (Guntars Dreijers)
17.	Defence of the report (Guntars Dreijers)
18.	The Role of Etiquette in Social Life
19.	Greeting, Introduction, Business cards
20.	Presents / Gifts, Flowers
21.	Etiquette for Everyday Activities
22.	Dress Code
23.	Invitation
24.	Etiquette at the Table; Types of Meals
25.	Smoking Etiquette
26.	Family and Ceremonious Events
27.	Sad Events Etiquette
28.	Business Communication Culture
29.	Intercultural Communication
30.	Organization of Conference

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Project Management

(Projektu vadīšana)

Author	
LAIS course code	
Form of evaluation	Exam
Academic credit points (ECTS credit points)	6 ECTS
The total number of contact lessons	13
The number of lectures	
The number of practical classes	
Prerequisites	N/A
Part of the study programme	General education study courses

Study course objective

The study course objective is to provide knowledge about theoretical aspects of project management, with special focus on adopting practical skills in project writing.

Study results

Having acquired the study course, a student:

- Is acquainted with theoretical aspects of project management
- Has tested their skills in using theory with practical examples
- Is able to draft project individually for different needs of enterprises

Organization mode of students` individual assignments

The independent work of students includess:

- Individually drafted project
- analysis of real projects

Evaluation of study results

The end result is made of:

- 10% – attendance, work during lectures
- 40% – individual work (2-3 students) – output, handing in and presentation of project
- 50% – examination

Study course outline

No.	Title of the topic
1.	Concept of project and its management, project management history.
2.	Component parts, methods, ways and means of project management.
3.	Project life-cycle.
4.	Project activities.

No.	Title of the topic
5.	Project idea and its inception.
6.	Ethical aspects of project management.
7.	Step by step planning of project.
8.	Accomplishment of project plan.
9.	Monitoring and control of project.
10.	Project communication.
11.	Project team.
12.	Closing of project.
13.	Selection and documentation of project.

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Language as a Means of Business Communication

(Valoda kā lietišķās saziņas līdzeklis)

Author	Lecturer Indra Grietēna
LAIS course code	
Form of evaluation	Final test
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	Knowledge of English at upper-intermediate level-practical courses of English
Part of the study programme	General education study courses

Study course objective

The study course objective is:

1. To give students a comprehensive view of communication, its scope and importance in business.
2. To provide opportunities for practicing the language of a range of specific and general business situations.
3. To develop language and communication skills most needed by business people in business environment.
4. To help students to actively share knowledge of the business world to improve their marketability (networking).

Study results

Having acquired the study course, a student:

1. Is able to develop interpersonal skills that contribute to effective and satisfying personal, social and professional relationships.
2. Has completed an accurate, complete CV/ resume and cover letter.
3. Has conducted excellent interviews and complete follow-up employment correspondence.
4. Is able to write effective and concise notes, memos and e-mails.
5. Has made and answered telephone calls on business matters.

Organization mode of students' individual work

The independent work of students includes:

1. Students prepare individually at home a variety of tasks related to the current course theme.
2. Students prepare individually at home business writing assignments.

3. Students prepare individually or in small groups role-plays/ business situations with their subsequent delivery in the class.

Evaluation of study results
The end result is made of:

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E-management

(E-pārvaldība)

Author	Dr. sc. ing., assistant professor Raita Rollande
LAIS course code	VadZ1010
Form of evaluation	Exam
Academic credit points (ECTS credit points)	6 ECTS
The total number of contact lessons	13
The number of lectures	
The number of practical classes	
Prerequisites	N/A
Part of the study programme	General education study courses

Study course objective

The study course objective is to introduce students with theoretical aspects of e-government and to provide practical skills in the use of e-government solutions.

Study results

Having acquired the study course, a student:

- Is capable of understanding the concept of e-government.
- Is able to understand the use of e-government.
- Is able to choose e-government solutions.
- Is able to practically work with e-government systems.

Organization mode of students' individual work

The independent work of students includess:

- Practical works. Students complete works given by lecturer
- Preparation for exam

Evaluation of study results

The end result is made of:

- Practical assignments (40%)
- Exam (60%)

Study course outline

No.	Title of the topic
1.	Introduction of E-government. E-government, e-democracy. Aims of e-government. E-government – a wiser management. Key trends of e-government
2.	E-government solutions of organizations
3.	E-services
4.	E-government
5.	ICT application software in e-governance

No.	Title of the topic
6.	Perspective of ICT governance. Problems of e-government
7.	Use of record keeping – templates in e-governance
8.	Creation of presentations, distant presentation
9.	Project management
10.	Accounting systems of e-governance
11.	Customer relationship management (CRM)
12.	Cooperation and communication programs. Cooperation program “Groove”
13.	Document management. Solutions of document management

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Politics and Economics of EU

(Eiropas Savienības politika un ekonomika)

Author	Assistant prof. Diāna Potjomkina
LAIS course code	
Form of evaluation	Examination
Academic credit points (ECTS credit points)	6 ECTS
The total number of contact lessons	32
The number of lectures	32
The number of practical classes	0
Prerequisites	
Part of the study programme	General education study courses

Study course objective
The study course objective is to become familiar with EU's structures political and economic principles, have a good knowledge about EU's perspective in economic sustainability and competitiveness.

Study results
Having acquired the study course, a student:

- Understand political principles of EU's framework and have a good knowledge about process of accepting political decisions.
- Understand economic principles of EU's framework and have a good knowledge about process of accepting economic decisions.
- Have a good knowledge about main economic indicators, are able to estimate economic problems and to find variations solutions.
- Have a good knowledge about EU's global competitiveness perspective.

Organization mode of students' individual work
The independent work of students include:

- Course paper

Evaluation of study results
The end result is made of:

- Examination

Study course outline

No.	Title of the topic
1.	Political principles of EU's framework. The Treaty of Lisbon.
2.	Economic policy principles of EU. Euro area. Activity of ECB.
3.	Social policy of EU. Migration and demography.
4.	Foreign policy of EU.

No.	Title of the topic
5.	Extension of EU.
6.	Global competitiveness of EU.

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Language as a Means of Business Communication II

(Valoda kā lietišķās saziņas līdzeklis II)

Author	Lecturer Indra Grietēna
LAIS course code	
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	7
The number of lectures	
The number of practical classes	
Prerequisites	Language as a Means of Business Communication I
Part of the study programme	General education study courses

Study course objective
The study course objective is:
- To give students a comprehensive view of communication, its scope and importance in business.
- To provide opportunities for practicing the language of a range of specific and general business situations.
- To develop language and communication skills most needed by business people in business environment.
- To help students to actively share knowledge of the business world to improve their marketability (networking).

Study results
Having acquired the study course, a student:
1. Is capable of developing interpersonal skills that contribute to effective and satisfying personal, social and professional relationships
2. Is able to plan successfully for and participate in business meetings
3. Is able to use an appropriate format and business writing style and apply conventions to Standard English
4. Is capable of preparing informal and formal reports
5. Is able to define the key skills employed by effective presenters
6. Is able to deal with cultural differences in non-verbal communication

Organization mode of students` individual assignments
The independent work of students includess:
- Students prepare individually at home a variety of tasks related to the current course theme.
- Students prepare individually at home business writing assignments.
- Students prepare individually or in small groups role-plays/ business situations with their subsequent delivery in the class.

Evaluation of study results

The end result is made of:

- Punctuality and regular attendance (75% of the total number of classes) in classes is of prime importance for successful completion of this course.
- Active participation in class activities.
- Successfully passed (60%) midterm tests.
- Portfolio of business writing assignments.
- Successfully passed (60%) final exam at the end of Term II.

Study course outline

No.	Title of the topic
1.	Conducting Business Meetings. Exchanging Opinions. Taking Minutes of Meetings.
2.	Negotiating a Deal.
3.	Effective Public Presentation.
4.	Writing Reports.
5.	Conventions of Business Correspondence.
6.	Non-verbal Communication.
7.	Using Social Networks.

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Public Speaking and Presentation Skills

(Publiskā runa un prezentāciju prasmes)

Author	Lecturer Indra Grietēna
LAIS course code	
Form of evaluation	Exam
Academic credit points (ECTS credit points)	6 ECTS
The total number of contact lessons	
The number of lectures	
The number of practical classes	
Prerequisites	N/A
Part of the study programme	General education study courses

Study course objective

Study results

Organization mode of students' individual work

Evaluation of study results

Study course outline

No.	Title of the topic
1.	
2.	

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Economic and Political Aspects of Entrepreneurship

(Uzņēmējdarbības ekonomiskie un politiskie aspekti)

Author	Dr. paed., MBA Vita Balama
LAIS course code	
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	
The number of lectures	
The number of practical classes	
Prerequisites	N/A
Part of the study programme	General education study courses

Study course objective
The study course objective is

Study results
Having acquired the study course, a student:

Organization mode of students' individual work
The independent work of students includess:

Evaluation of study results
The end result is made of:

Study course outline

No.	Title of the topic
1.	The contemporary world of entrepreneurship: a. Entrepreneurship b. Opportunities c. Industry analysis d. Cognitive foundations of entrepreneurship
2.	Assembling resources: a. Acquiring essential information b. Human resources – the team c. Financial resources
3.	Business plan: a. The benefits of clear-cut goals b. Components of a business plan c. Business plan presentation
4.	Launching a new venture: a. The legal environment

No.	Title of the topic
	b. Marketing c. Planning for competitive advantage d. Intellectual property
5.	Running the business: a. Essential skills for entrepreneurs b. Building the new venture’s human resources
6.	Strategies for entrepreneurs: a. Exit strategies: i. Sale or transfer to insiders ii. Sale to outsiders iii. The value of a business iv. Taking a company public b. Negotiation: i. Its basic structure ii. Tactics of negotiation

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English Phonetics

(Angļu valodas fonētika, EN)

Author	Maruta Koha, Lecturer, mag.paed
LAIS course code	Valo1008
Form of evaluation	Term test (pass/fail)
Academic credit points (ECTS credit points)	2 ECTS
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	Secondary school English
Part of the study programme	General education study courses

Study course objective

The study course objective is to form, perfect and, where necessary, correct the students' English pronunciation skills. With various theoretical and practical tasks and exercises, to support the students in acquiring permanent receptive and productive speech skills.

Study results

Having acquired the study course, a student:

- Students have acquired the relevant notions and terms in English and are able to comprehend theoretical/learning materials, provided to them in English, on the various aspects of English pronunciation, and English phonetics in general.
- Students have acquired the phonemic signs of English consonants and vowels (transcription), know and are able to use the International Phonemic Alphabet in order to transcribe the pronunciation of sounds/words.
- Students have acquired/improved speaking skills with a correct word or sentence stress, speech rhythm, functionally suitable intonation, as well as relevant positional changes of phonemes in fluent speech.
- Students have a reduced/minimised influence of their native language (Latvian, Russian) upon their speech performance in English.

Organization mode of students' individual work

The independent work of students include:

- Home tasks: reading on theoretical issues from recommended sources, handouts, learning materials on the Moodle, practical pronunciation exercises, including better pronunciation imitation exercises, phonemic transcription of words/sentences, preparing extracts of texts for good pronunciation performance (read or spoken);
- Work with pronunciation dictionaries, such as Longman Pronunciation Dictionary;

- Individual End-of-Term Assignment: to prepare reading (for recording or in-person delivery) a fragment of a text, following the relevant recommendations as to correct word- or sentence stress, rhythm, intonation etc.

Evaluation of study results
The end result is made of:
- Regular work on home assignments;
- Active participation in classes (at least 70% from the total number of classes);
- All the tests during the course taken, achieved a pass-mark of at least 60%;
- Well-prepared and delivered the individual speaking assignment.

Study course outline

No.	Title of the topic
7.	Phonetics as a branch of linguistics studying the phonemic means of a language. Production of speech. Phoneme and allophone. Use of the International Phonemic Alphabet. The signs adopted for consonants and vowels. Phonemic transcription.
8.	Organs of speech, their function in production of speech. Main principles of the classification of English consonants and vowels.
9.	Articulation of English consonants and vowels, with the focus on the sounds significantly different from Latvian/Russian. Voiced/ voiceless consonants, their influence upon the length of vowels in pronunciation. Aspiration of consonants. A brief insight into some varieties of E. pronunciation.
10.	The syllable. Word stress/accent. Patterns of word-stress in compound words, multi-syllable words, words with the so-called separable prefix and variable stress words. Stress in words with specific suffixes.
11.	Sentence stress. Basic and contrastive (logical) stress, its role and perception in speech. Changes of certain phonemes in speech context: strong and weak forms
12.	Speech rhythm as characteristic to the English language, speech units/rhythm groups in the sentence.
13.	Speech intonation: length, pitch and tone, as a means of expressing various emotional meanings in communication.
14.	Preparing an individually-chosen fragment of text for expressive speech/reading delivery in class.

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Mathematics I

(Matemātika I)

Author	Prof. Dr. habil.phys Juris Roberts Kalniņš
LAIS course code	Mate1019
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	16
The number of practical classes	
Prerequisites	N/A
Part of the study programme	General education study courses

Study course objective

The study course objective is to make students familiar with the basic concepts, principles, and methods of mathematics which will be valuable in economics and business administration courses.

Study results

Having acquired the study course, a student:

- Is able to Understand the basics of mathematics used in economics and business.

Organization mode of students' individual work

The independent work of students includess:

- regular attendance of lectures.
- completion of homework assignments in time.
- Studies of course material
- consultations with lecturer.

Evaluation of study results

The end result is made of:

- Homework assignments – 20%;
- Class tests – 30%;
- Exam – 50%.

Study course outline

No.	Title of the topic
1.	Sets, functions, relations, graphs, graph tools
2.	The concept of limit. Sequences, series
3.	Continuity of function. Slope. The meaning of derivative
4.	Differentiation formulas. Compound functions
5.	Differential. Elasticity

No.	Title of the topic
6.	Higher order derivatives. Geometric interpretations. Examples
7.	Taylor's formula. Maxima and minima
8.	Analysing of functions using derivatives
9.	Antiderivative, indefinite integrals
10.	Integral sum. Definite integral, geometric meaning. Integration by parts
11.	Partial differentiation. Economic applications
12.	Gradient and hessian
13.	Unconstrained optimization
14.	Optimization with constraints. Lagrange multiplier method

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Microeconomics

(Mikroekonomika)

Author	Professor Ivars Brīvers, Dr.oec.
LAIS course code	Ekon1011
Form of evaluation	Exam
Academic credit points (ECTS credit points)	4.5 ECTS
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	Mathematics and Basic economics
Part of the study programme	General education study courses

Study course objective

The study course objective is to provide students with a general understanding of economic categories, main theoretical concepts on which are based the processes in real economies in a micro level.

Study results

Having acquired the study course, a student:

- Is able to explain basic economic concepts and issues and formulate the subject of the economy. Understand the historical causes of the division of economic theory in microeconomics and macroeconomics, and its actuality in the modern world. Able to explain the subjects of microeconomics and macroeconomics
- Based on game theory knowledge, is able to assess the objective conditions that affect individual decision-making in the community
- Is able to explain the benefits of labor division and trade as a whole, and critically evaluate the benefits of it in a broader perspective
- Is able to explain how the market price is formed, and how external factors affect the price changes
- Is able to assess consumer’s behavior in the market as a basis for demand
- Is able to assess producer’s behavior in the market as a basis for supply
- Is able to distinguish between different types of market competition and the market mechanism differences in each of them

Organization mode of students’ individual work

The independent work of students includess:

- Regular attendance of lectures
- Completion of assignments on time
- Studies of course material
- Consultations with lecturer

Evaluation of study results

The end result is made of:

- Results of independent work during the semester (40%)
- Evaluations of tests (40%)
- Results of the exam in writing (20%).

Study course outline

No.	Title of the topic
1.	Introduction to Macroeconomics
2.	Individual and social preferences. Game theory
3.	Introduction in microeconomics
4.	Demand, supply and market equilibrium
5.	Elasticity of demand and supply
6.	Consumer’s rational behavior
7.	Producer’s behavior
8.	Imperfect competition

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Statistics

(Statistika)

Author	Prof., Dr. habil. phys. Juris Roberts Kalniņš
LAIS course code	Ekon1014
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	16
The number of practical classes	
Prerequisites	Mathematics I and Mathematics II
Part of the study programme	General education study courses

Study course objective

The study course objective is to give students the understanding of basic concepts of probability discrete and continuous. To introduce students to statistical methods.

Study results

Having acquired the study course, a student:

- Is capable of understanding the basics of probability theory and statistics
- Is able to use statistical methods in economics and business

Organization mode of students' individual work

The independent work of students includdess:

- regular attendance of lectures
- completion of homework assignments in time
- studies of course material, consultations with lecturer

Evaluation of study results

- Homework assignments – 20%
- Class tests – 30%
- Exam – 50%.

Study course outline

No.	Title of the topic
1.	Basic concepts. Intuitive considerations. Examples. Random variables. Sample space and events. Union and intersection of two events. Discrete random variables. Counting of probability

No.	Title of the topic
2.	Axioms of probability. Conditional probabilities. Bayes theorem. Probability mass function. Cumulative distribution function
3.	Expectation and dispersion. Chebyshev’s inequality. Uniform distribution. Binomial distribution. Poisson distribution. (Excel)
4.	Continuous random variables. Probability density function
5.	Cumulative distribution functions. Charasteristics of probability distribution. Normal distribution. Exponential probability distribution. Logonormal distribution. Law of large numbers
6.	Pairs of random variables. Joint probability density functions
7.	Mathematical statistics. Descriptive statistics and inferential statistics. Population and sample. Representative sampling
8.	Descriptive ststistics. Mean. median, mode, variance and standard deviation. Grouped and ungrouped data. Percentiles, interquartile, range, skewness, kurtosis
9.	Calculation of indexes. Gini coefficient
10.	Statistical inference. Central limit theorem. Confidence intervals
11.	Hypothesis testing
12.	P-value approach. Two sample statistics
13.	Correlation

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(Interpersonal) Psychology

(Psiholoģija)

Author	Assistant Prof. Dr. Guntars Dreijers
LAIS course code	Psih3001
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	English level B1/B2
Part of the study programme	General education study courses

Study course objective

The study course objective is to provide students with basic concepts that help to understand oneself and other people, behavior, mind, psyche better in the private, social, and business contexts, particularly in multinational, global, and international environments.

Study results

Having acquired the study course, a student:

- Have gained insights into behaviour-mind-psyche patterns for interpersonal interactive efficiency both in private and professional lives,
- Are able to analyze models of interaction,
- Have gained basic knowledge of human psychology, and its terminology in English, and how certain theories apply to everyday private and business life.

Organization mode of students' individual work

The independent work of students include:

- preparation of individual work, presentations, reports on the following topics - investigating a personality; archetypes; genius, talent, madness,
- reading and analyzing the text "The seven tales of talent management",
- organization of structured debates about the topic "Friend or colleague in a workplace",
- making a report on workplace psychological culture - counselling, feedback; choose a company and describe how developed a psychological culture is.

Evaluation of study results

The end result is made of:

- The final exam –80%
- Individual work – 20%

Students will be provided oral feedback on how they have performed after presenting the results of individual work, and theoretical issues will be assessed in a final written exam. Active participation and thoroughly prepared individual work might add a point to the result of the final exam

Study course outline

No.	Title of the topic
1.	Personality, behaviour
2.	Abnormal psychology
3.	Relationships
4.	Emotions, EI
5.	Creativity, Thinking
6.	Stress, Burnout
7.	Defence Mechanisms
8.	Groups, Teams, Leadership
9.	Interpersonal communication in a workplace
10.	Social perception

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Aspects of Intercultural Communication I

(Starpkultūru komunikācijas aspekti I)

Author	Dr.paed., MBA, assist.prof. Vita Balama
LAIS course code	SDSK1009
Form of evaluation	Test
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	10
The number of practical classes	6
Prerequisites	Intermediate knowledge of English- minimum B2 level (course language of instruction is English)
Part of the study programme	General education study courses

Study course objective

The study course objective is to provide insight into problems of intercultural communication, develop intercultural communication skills (openness, tolerance, adaptability).

Study results

Having acquired the study course, a student:

- is able to present knowledge of intercultural communication,
- has ability to critically analyze data related to this field.

Organization mode of students' individual work

The independent work of students include:

- a regular learning of the course by using lecture materials, study literature, internet resources,
- course paper development on chosen research topic,
- presentation of the research topic,
- preparations for the test.

Evaluation of study results

The end result is made of:

- Course paper 30%
- Research topic presentation 30%
- Test 40%

Study course outline

No.	Title of the topic
1.	Intercultural communication, its place in classification of sciences, problems, methods.
2.	Concept of culture in anthropology, ethnology, sociology, semiology. Culture and civilization.
3.	Concepts of identity and otherness. We and others.
4.	Stereotypes and emblems.
5.	Typology of culture.
6.	Forms of intercultural communication: assimilation, acculturation, integration.
7.	Areas of intercultural communication: economy, culture, everyday life.
8.	Culture shock.
9.	Acquisition of intercultural competence.
10.	Cultural issues and different national identities.

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The English Language: Communication Aspects

(Angļu valoda: komunikācijas prasmes)

Author	
LAIS course code	Citi1031
Form of evaluation	Tests
Academic credit points (ECTS credit points)	6 ECTS
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	
Part of the study programme	General education study courses

Study course objective

The study course objective is:

- To extend the essential English vocabulary on different themes
- To enrich the student' s knowledge of English by appropriate phraseology, idioms, synonyms and antonyms
- To improve listening and speaking skills

Study results

This course encourages and motivates students to communicate orally in English with confidence. Relaxed and positive atmosphere in lectures makes lectures more productive and more motivating place to learn. The positive atmosphere enables students to overcome typical barriers in communication.

Organization mode of students' individual work

The independent work of students includes:

- Vocabulary and written exercises
- Communication exercises
- Group work and tasks
- Role playing
- Individual and group presentation
- Discussion, brainstorming and debates
- Reading and listening comprehension

Conversation techniques

Evaluation of study results

The end result is made of:

Study course outline

No.	Title of the topic
1.	
2.	

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Introduction into Theories of Public Relations

(Ievads sabiedrisko attiecību teorijā)

Author	
LAIS course code	Soci1003
Form of evaluation	Test
Academic credit points (ECTS credit points)	6 ECTS
The total number of contact lessons	16
The number of lectures	
The number of practical classes	
Prerequisites	
Part of the study programme	General education study courses

Study course objective

The study course objective is to provide students with discretion of theory and practice of Public Relations in enterprise. Based on theory and examples in practice to create understanding about place and role of Public Relations in enterprise, to reflect opportunities of action of Public Relations.

Study results

Having acquired the study course, a student:

- Is able to orient themselves in fields of activity of Public Relations, channels and forms
- Is able to to build corporate image of enterprises

Organization mode of students' individual work

The independent work of students includes:

Individual practical work during studies – press releases, interviews, website analyse of enterprise.

Evaluation of study results

The end result is made of:

- 50% test
- 30% practical assignments in total
- 20% work during lectures

Study course outline

No.	Title of the topic
1.	Entity, functions, models and history of Public Relations.
2.	Public relation activities target defining depending on organization type. Public Relation tasks.
3.	Main types of public relation activities and corporate image of enterprise.

No.	Title of the topic
4.	Public relations as relations with the media. Journalism as communication process and product. New mass media.
5.	Press releases and announcements to the press. Interview. Press conference.
6.	Internal and external communication.
7.	Efforts of public relations. Exhibitions, presentations and organization of events.
8.	Output of public relation programs. Quality criteria.
9.	Public relations in marketing communications.
10.	Reputation of enterprise.
11.	Place and role of public relations in enterprise and society.

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Accounting

(Grāmatvedība)

Author	Justine Sofija Jaunzeme
LAIS course code	VadZ2021
Form of evaluation	Exam
Academic credit points (ECTS credit points)	6 ECTS
The total number of contact lessons	15
The number of lectures	15
The number of practical classes	
Prerequisites	N/A
Part of the study programme	General education study courses

Study course objective

The study course objective is to provide students with an opportunity to learn the basics of accounting, in order to acquire a foundation necessary for continuing on with studies of International Financial Reporting Standards.

Study results

Having acquired the study course, a student:

- Has gained knowledge: student will be able to 1) define the purpose of financial reporting, 2) to term and to describe the elements of financial statements and the basic principles of financial reporting, 3) to characterize main accounting registers, 4) to describe the contents of financial statements.
- Has obtained skills: student will be able to 1) account for business transactions which constitute financing, investment, supply, production, sales, payroll and tax cycles, 2) to calculate the cost of inventories according to weighted-average cost method and the method "First-in, first-out", 3) to do accounting period – end adjusting entries, 4) to do accounting period – end closing entries, 5) to prepare balance sheet, profit and loss, statement of changes in equity, cash flow statement, and simplified notes to the financial statements.
- Has developed competencies: student will be able to 1) classify business transactions according to financial statement elements – assets, liabilities, owners' equity, income and expenses, 2) to substantiate the chosen depreciation (amortization) method for non-current assets and the inventory costing method selected, 3) to argue in favour of the need for accounting period-end adjusting entries, 4) to select information for disclosure in the notes to the financial statements, 5) to apply the knowledge gained in further studies as well as on the job of an accountant or an audit assistant.

Organization mode of students' individual work

The independent work of students includess:

- the preparation of companies' cash flow statements and notes to the financial statements.

Evaluation of study results

The end result is made of:

- Individual assignment composes 50% of the final semester grade,
- final exam – 50% of the final grade for the semester.

Study course outline

No.	Title of the topic
1.	Introduction to accounting. Accounting records and systems. Basic principles and concepts of financial accounting.
2.	Founding of a company. Accounting for financing transactions
3.	Accounting for investment transactions
4.	Amortization and depreciation of long-term assets
5.	Procurement and revenue cycles at trading company
6.	Procurement, manufacturing and revenue cycles at manufacturing company. Direct and full costing of inventory
7.	Period costs
8.	Debtors and creditors
9.	Foreign currency transactions
10.	Accounting for financial instruments
11.	Year-end adjusting and closing entries
12.	Preparation of balance sheet and profit and loss
13.	Preparation of cash flow statements
14.	Preparation of notes to the financial statements
15.	Introduction to accounting softwares

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Entrepreneurship

(Uzņēmējdarbība)

Author	(degree, position, first name, last name)
LAIS course code	VadZ2020
Form of evaluation	Exam
Academic credit points (ECTS credit points)	4.5 ECTS
The total number of contact lessons	16
The number of lectures	16
The number of practical classes	
Prerequisites	N/A
Part of the study programme	General education study courses

Study course objective

The study course objective consists of three main parts:

- To acquire students with latest theories in entrepreneurship, which can be applied when starting and developing business;
- To develop business thinking and to foster students' ability to identify business opportunities as well as skills;
- To develop business consultancy skills.

Study results

Having acquired the study course, a student:

- Has gained fundamental knowledge necessary in entrepreneurship and business management.
- Is able to identify business opportunities
- Has developed knowledge and skills as business opportunities to evaluate resources needed for the business.
- Has also obtained knowledge on how the business organization is functioning – knowledge is essential both for starting own business as well as for developing career path in international companies and organizations, becoming senior executives in large companies, including finance sector, as well as in NGOs or HEIs.

Organization mode of students' individual work

-

Evaluation of study results

-

Study course outline

No.	Title of the topic
1.	Creativity
2.	Skills for group work
3.	Starting business
4.	Factors which foster competitiveness of companies
5.	Successful business models
6.	Creative marketing
7.	Entering international markets
8.	Learning from success stories and mistakes

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EU Politics and Economy

(Eiropas Savienības politika un ekonomika)

Author	
LAIS course code	
Form of evaluation	Exam
Academic credit points (ECTS credit points)	6 ECTS
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	
Part of the study programme	General education study courses

Study course objective
The study course objective is to become familiar with EU's structures political and economic principles, have a good knowledge about EU's perspective in economic sustainability and competitiveness.

Study results
Having acquired the study course, a student:

- Understands political principles of EU's framework and has good knowledge about process of accepting political decisions.
- Understands economic principles of EU's framework and has good knowledge about process of accepting economic decisions.
- Has good knowledge about main economic indicators, is able to estimate economic problems and to find variations solutions.
- Has good knowledge about EU's global competitiveness perspective.

Organization mode of students' individual work
The independent work of students includes:
Course paper

Evaluation of study results
The end result is made of:
Examination

Study course outline

No.	Title of the topic
12.	Political principles of EU's framework. The Treaty of Lisbon.
13.	Economic policy principles of EU. Euro area. Activity of ECB.
14.	Social policy of EU. Migration and demography.
15.	Extension of EU.

No.	Title of the topic
16.	Global competitiveness of EU.

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Financial Mathematics

(Finanšu matemātika)

Author	Justīne Sofija Jaunzeme
LAIS course code	Ekon2006
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	Mathematics I and II, Entrepreneurship
Part of the study programme	General education study courses

Study course objective

The study course objective is:

- To provide students with an opportunity of learning the basic principles of financial mathematics as well as practical calculations in financial mathematics, by comparing different financial systems found worldwide,
- To acquiant students with the concepts and calculations of simple and compound interest and discount,
- To present the concepts of time value of money, cash flows, their present and future values and to teach students practical valuation of cash flows,
- To teach students the main financing and investment modes found in the Western financial system;
- To teach about chief criteria for evaluation of investment alternatives present in the Western financial system,
- To introduce students to the basics of Islamic finance and to compare Islamic finance with the Western financial system.

Study results

Having acquired the study course, a student:

- Has gained knowledge: student will be able to 1) describe rates of simple and compound interest and discount, 2) describe financing and investment modes that are typical of Western financial systems and the criteria for alternative investment evaluation, 3) characterise the main financial contracts of Islamic financial systems and to compare Islamic and Western financial systems.
- Has obtained skills: student will be able to 1) perform calculations of simple and compound interest and discount, 2) calculate present and future values of cash flows, 3) determine cost of equity and weighted – average cost of capital by applying the Capital Asset Pricing Model, 4) to determine the measures for investment evaluation (IRR, MIRR, NPV, "duration," "volatility" and others), 5) to apply the functions of program "Microsoft Excel" in the financial calculations.

- Has developed competences: student will be able to1) interpret the measures for investment evaluation, 2) to compare alternative investment projects according to various criteria, 3) to interpret the financial indicators published in financial press and other mass media, 4) to apply the knowledge acquired for further master's studies as well as on the job of a finance specialist or an accountant.

Organization mode of students' individual work
-

Evaluation of study results
The end result is made of:

- Results of practical assignments during the semester (50%)
- Results of the exam in writing (50%)

Study course outline

No.	Title of the topic
1.	Simple and compound interest and discount
2.	Cash flows, their future and present values
3.	Cost of equity capital and weighted – average cost of capital. Capital Asset Pricing Model
4.	The evaluation of alternative investment projects
5.	Cost of equity capital and weighted – average cost of capital. Capital Asset Pricing Model
6.	The evaluation of alternative investment projects
7.	Hedging and measure of its effectiveness
8.	Simple and compound interest and discount

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Project Management

(Projektu vadīšana)

Author	Lecturer, MBA Dace Štefenberga
LAIS course code	VadZ2018
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	13
The number of lectures	13
The number of practical classes	
Prerequisites	Basic knowledge in theory of business management
Part of the study programme	General education study courses

Study course objective

The study course objective is to provide knowledge about theoretical aspects of project management, transform theoretical knowledge in practical skills.

Study results

Having acquired the study course, a student:

- Is acquainted with theoretical aspects of project management,
- Has tested their skills in using theory with practical examples,
- Is able to draft project individually for different needs of enterprises.

Evaluation of study results

The end result is made of:

- 40 % – individual or group work: project development, submission and presentation
- 60% – exam

Study course outline

No.	Title of the topic
1.	Concept of projects and its management, project management history
2.	Component parts, methods, ways and means of project management
3.	Project life-cycle
4.	Project activities
5.	Project idea and its inception
6.	Ethical aspects of project management
7.	Step by step planning of project
8.	Accomplishment of project plan
9.	Monitoring and control of project
10.	Project communication

No.	Title of the topic
11.	Project team
12.	Closing of project
13.	Selection and documentation of project

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Office Management

(Lietvedība)

Author	Lecturer, MBA Dace Štefenberga
LAIS course code	VadZ3021
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	10
The number of lectures	10
The number of practical classes	
Prerequisites	Basic knowledge in Entrepreneurship and Management Theory
Part of the study programme	General education study courses

Study course objective

The study course objective is to acquire basic knowledge in records management, to learn how to prepare correctly documents, to understand records management system in an organization.

Study results

Having acquired the study course, a student:

- Has acquired theoretical aspects of the records management,
- Is able to prepare correctly documents for the office routines,
- Has gained basic knowledge about records management system in an organization,
- Has learnt how to maintain office routines in a company.

Organization mode of students' individual work

The independent work of students includes:

- Preparation and control of documents.

Evaluation of study results

The end result is made of:

- Preparation of documents in the class (40%)
- 2 tests during semester (30% each)

Study course outline No.	Title of the topic
1.	Concept of records management, importance in the company, main tasks of records management
2.	Document, documentation, legal aspect of a document
3.	Document language
4.	Circulation of documents, design of document circulation diagram
5.	Document registration and document control
6.	Document maintenance

Study course outline No.	Title of the topic
7.	Archive
8.	Automation system of office routine, electronic documents
9.	Personnel documentation
10.	Management documents – letters, orders, application letters, minutes, reports, description of duties, work agreements, proxy, CV etc.

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Sustainability of Society and “Green” Thinking

(Sabiedrības ilgtspēja un “zaļā” domāšana)

Author	
LAIS course code	
Form of evaluation	Test
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	
Part of the study programme	General education study courses

Study course objective

The study course objective is to provide students with a view of what socially fair, environmental quality retentive society principles might be – sustainable development while focusing on “green” thinking in sustainable development.

Study results

Having acquired the study course, a student:

Organization mode of students’ individual work

The independent work of students includes:

- Will be familiar with concept “development”, economic growth
- Will have an insight in the interaction of human and environment, as well as long-term economic development. Knowledge of environmental protection and values

Evaluation of study results

The end result is made of:

- 80% test
- 20% individual work – presentation of a company that supports “green” thinking

Study course outline

No.	Title of the topic
1.	Human and environment (natural and environmental resources, land systems, environmental health concept).
2.	Economics-environment-growth (economics and sustainable development, economic value of environment, assessment methods, search of balance between environmental protection and economic growth).
3.	International co-operation in environmental protection and sustainable development (co-operation and development, international environmental problems, development of

No.	Title of the topic
	international co-operation, modern features of international co-operation in environmental protection and sustainable development).
4.	Environmental management: policy, legislation and institutions.
5.	Cultural environment.
6.	Students' role in sustainable development: creating an attractive sustainable future.

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Business Modelling

(Biznesa modelēšana)

Author	Prof., Dr.habil.phys. Juris Roberts Kalniņš
LAIS course code	VadZ1042
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	16
The number of practical classes	
Prerequisites	Mathematics I and Mathematics II
Part of the study programme	General education study courses

Study course objective
The study course objective is to introduce students to business modeling and simulation using visual modeling tools (Vensim PLE, business process tools).

Study results
Having acquired the study course, a student:

- Is capable of understanding the basics of business visual modeling and simulation of models learned in economic and business courses,
- Is capable of understanding how to build a simple business models and manage business through models and simulation.

Organization mode of students' individual work
The independent work of students includes:

- regular attendance of lectures,
- completion of homework assignments in time,
- studies of course material,
- consultations with lecturer.

Evaluation of study results
The end result is made of:

- Homework assignments – 20%
- Class tests – 20%
- Exam – 50%

Study course outline

No.	Title of the topic
1.	Modeling and models. Different meanings of modeling in business
2.	Systems view. Complex systems. Systems models. System thinking language. Visual modeling tools. VensimPLE

No.	Title of the topic
3.	Causal Loop Diagrams. Business Dynamics. Business development
4.	Business visual modeling. Stocks, flows and variables
5.	Systems archetypes. Simplest models in VensimPLE
6.	Banking. Leasing model
7.	Management of production and inventory
8.	Cost Volume Profit model. Project management model
9.	Business growth. Business collapse. Delays. Concurrence model
10.	Supply chains. Supply game. Game model
11.	Modeling Demand and Supply. Buying/selling model (marketing)
12.	Structural models: flowcharting. Simple process diagramming
13.	Arena simulation
14.	Agent based modeling. Forex model
15.	Wealth distribution. Managing business
16.	Options market

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Strategic Management

(Stratēģiskā vadība)

Author	Docent Liene Resele
LAIS course code	VadZ3035
Form of evaluation	Exam
Academic credit points (ECTS credit points)	4.5 ECTS
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	Knowledge in Management Theory, Marketing, Microeconomics, Macroeconomics, Management Accounting
Part of the study programme	General education study courses

Study course objective

The study course objective is to provide students with comprehensive understanding of the competitiveness of companies, the nature of strategic management and companies' main strategies. To improve students' knowledge and skills in business management decision-making for the successful operation of the company in the long run.

Study results

Having acquired the study course, a student:

- Has knowledge about the company's strategic management process,
- Is able to identify strategies used in the companies.
- Is able to analyze, systematize and integrate the information obtained, is able to interpret and argumentatively debate on the strategic management issues.

Organization mode of students' individual work

The independent work of students includes:

- lectures, participation in seminars, developing and submitting individual tasks: Critical analysis of the recent (in the last 3 years) scientific article on strategic management issues (amount of no more than 3 pages). The selected article should be submitted together with the analysis.
  Analysis of the strategy of one company operating in Latvia.

Evaluation of study results

The end result is made of:

- work in the lectures and seminars – 20%,
- individual work (the analysis of the article) – 30%,
- the individual work (the analysis and the presentation of company's strategy) – 30%,
- test – 20%.

Study course outline

No.	Title of the topic
7.	The goal and process of the strategic management. The company's competitiveness. The company's competitive advantage.
8.	Determination of the strategic direction of the company. Formulation of the objectives of the company.
9.	Analysis of the internal and external environment.
10.	Basic functional-level strategies. Integrated risk management.
11.	Basic business-level strategies.
12.	Basic corporate-level strategies.
13.	Implementation of the strategy.

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Media Communication in a Multicultural Environment

(Plašsaziņas līdzekļu komunikācija multikulturālā vidē)

Author	
LAIS course code	
Form of evaluation	Exam
Academic credit points (ECTS credit points)	ECTS
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	
Part of the study programme	General education study courses

Study course objective
The study course objective is

Study results
Having acquired the study course, a student:

Organization mode of students' individual work
The independent work of students includes:

Evaluation of study results
The end result is made of:

Study course outline

No.	Title of the topic
14.	
15.	

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Strategic Management

(Stratēģiskā vadība)

Author	Assistant Professor Liene Resele
LAIS course code	VadZ3035
Form of evaluation	Exam
Academic credit points (ECTS credit points)	4.5 ECTS
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	Knowledge in Management Theory, Marketing, Microeconomics, Macroeconomics, Management Accounting
Part of the study programme	General education study courses

Study course objective

The study course objective is to provide students with comprehensive understanding of the competitiveness of companies, the nature of strategic management and companies' main strategies. To improve students' knowledge and skills in business management decision-making for the successful operation of the company in the long run.

Study results

Having acquired the study course, a student:

- Students have knowledge about the company's strategic management process,
- Students are able to identify strategies used in the companies,
- Students are able to analyze, systematize and integrate the information obtained, are able to interpret and argumentatively debate on the strategic management issues.

Organization mode of student's individual work

The independent work of students include:

- critical analysis of the recent (in the last 3 years) scientific article on strategic management issues (amount of no more than 3 pages). The selected article should be submitted together with the analysis. Deadline for submission – no later than October 29th,
- analysis of the strategy of one company operating in Latvia. Deadline for submission – no later than December 3rd.

Evaluation of study results

The end result is made of:

- Work in the lectures and seminars – 20%
- Individual work (the analysis of the article) – 30%

- The individual work (the analysis and the presentation of company’s strategy) – 30%
- Test – 20%

Study course outline

No.	Title of the topic
1.	The goal and process of the strategic management. The company's competitiveness. The company's competitive advantage
2.	Determination of the strategic direction of the company. Formulation of the objectives of the company
3.	Analysis of the internal and external environment
4.	Basic functional-level strategies. Integrated risk management
5.	Basic business-level strategies
6.	Basic corporate-level strategies
7.	Implementation of the strategy

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Mathematics II

(Matemātika II)

Author	Prof., Dr.habil.phys. Juris Roberts Kalniņš
LAIS course code	Mate1018
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	16
The number of practical classes	
Prerequisites	Mathematics I
Part of the study programme	General education study courses

Study course objective

The study course objective is to introduce students to the basic concepts, principles, and methods of mathematics which will be valuable in economics and business administration courses.

Study results

Having acquired the study course, a student:

- Is capable of understanding the basics of mathematics used in economics and business.

Organization mode of students' individual work

The independent work of students includes:

- regular attendance of lectures,
- completion of homework assignments in time,
- studies of course material,
- consultations with lecturer.

Evaluation of study results

The end result is made of:

- Homework assignments – 20%
- Class tests – 20%
- Exam – 50%

Study course outline

No.	Title of the topic
1.	Matrices. Matrix algebra. (Excel). Identity matrix. Inverse matrix (Excel)
2.	Transposition of matrix (Excel). Determinant (Excel)
3.	Systems of linear equations
4.	Examples. Solution (Excel)

No.	Title of the topic
5.	Elements of linear programming. Formulation of production problem. Mixture problem
6.	Two variables. Graphical solution
7.	Excel Solver. Feasible region
8.	Arbitrary number of variables
9.	Sensitivity. Conception of Shadow prices
10.	Duality. Analyze an example
11.	Transportation problem
12.	Input-output model, matrix as production function of the firm. Solution on Excel
13.	Basics of game theory. Prisoners' Dilemma. Other examples. Static games of complete information
14.	Mixed strategies. Analytical solution of 2x2 game
15.	Graphical solution of 2xm and nx2 games
16.	Reduction to linear programming. Nash equilibrium

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Econometrics

(Ekonometrija)

Author	Prof., Dr.habil.phys. Juris Roberts Kalniņš
LAIS course code	Ekon1010
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	16
The number of practical classes	
Prerequisites	Mathematics II and Statistics
Part of the study programme	General education study courses

Study course objective

The study course objective is to introduce students to basic concepts, principles, and methods of econometrics.

Study results

Having acquired the study course, a student:

- Understanding the basics of mathematics used in economics and business.

Organization mode of students' individual work

The independent work of students includes:

- regular attendance of lectures,
- completion of homework assignments in time,
- studies of course material,
- consultations with lecturer.

Evaluation of study results

The end result is made of:

- Homework assignments – 30%
- Exam – 70%.

Study course outline

No.	Title of the topic
1.	Basic concepts of econometrics. Review: correlation, hypothesis testing, multiple correlation, covariance
2.	Regression. Simple linear regression
3.	Ordinary least square method. Errors
4.	Coefficient of determination. Forecasting and prediction. Confidence interval. Excel functions
5.	Hypothesis tests for slope, interception
6.	Significance of regression, Anova

No.	Title of the topic
7.	Graph error analysis. Excel tool Regression
8.	Heteroskedasticity. Autocorrelation
9.	Multiple regression, assumptions and equation
10.	Confidence interval. Hypothesis testing
11.	Multiple regression analysis
12.	Dummy variables
13.	Multicollinearity
14.	Nonlinear regression. Linearization. Example analysis
15.	Nonlinear multiple regression
16.	Time series

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Management Accounting

(Vadības grāmatvedība)

Author	Justine Sofija Jaunzeme
LAIS course code	VadZ2024
Form of evaluation	Exam
Academic credit points (ECTS credit points)	6 ECTS
The total number of contact lessons	15
The number of lectures	15
The number of practical classes	
Prerequisites	Accounting I
Part of the study programme	General education study courses

Study course objective

The study course objective is to provide students with an opportunity to learn management accounting theory and to master applied management accounting problem solving.

Study results

- Has gained knowledge: student will be able to 1) describe the role that management accounting plays in companies' management, 2) to list differences between financial and management accounting, 3) to term and to characterize direct and indirect, variable and fixed costs, and other cost categories, 4) to characterize traditional and ABC costing systems.
- Has obtained skills: student will be able to 1) classify costs according to cost categories, 2) to assign manufacturing overhead to individual products and other cost objects, 3) to perform costing, 4) to carry out cost-volume-profit analysis, 5) to prepare company's budget and to implement budgetary control.
- Has developed competencies: student will be able to 1) substantiate the classification of costs, 2) to select appropriate costing systems, 3) substantiate the product pricing decisions, 4) to evaluate the performance of the company, by comparing actual results with the budgetary figures, 5) to apply the knowledge gained in further studies as well as on the job of an accountant.

Organization mode of students' individual work

The independent work of students includes:

- Individual assignment is organized in the form of product costing and pricing problems.

Evaluation of study results

The end result is made of:

- Individual assignment – 50%
- Final exam – 50%

Study course outline

No.	Title of the topic
1.	Introduction to management accounting. Costs and their classification
2.	Costs assignment: traditional cost assignment
3.	Costs assignment: activity-based costing
4.	Process costing
5.	Job costing
6.	Cost-volume-profit analysis
7.	Measuring relevant costs and revenues for decision-making
8.	Pricing decisions and profitability analysis
9.	Decision-making under conditions of risk and uncertainty
10.	Capital investment decisions
11.	The budgeting process
12.	Budgetary control
13.	Standard costing and variance analysis
14.	Divisional financial performance analysis
15.	New developments in management accounting. Energy accounting. Wrap up

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Marketing

(Tirgzinības)

Author	Justine Sofija Jaunzeme
LAIS course code	VadZ2025
Form of evaluation	Exam
Academic credit points (ECTS credit points)	6 ECTS
The total number of contact lessons	11
The number of lectures	11
The number of practical classes	
Prerequisites	Entrepreneurship, Microeconomics
Part of the study programme	General education study courses

Study course objective

The study course objective is to teach students how to identify existing and possible problems which are related to marketing and marketing issues in entrepreneurship, as well as to analyse reasons and consequences in order to determine strategic and tactical solutions.

Study results

Having acquired the study course, a student:

- Is capable of determining main reasons of problem situation in marketing
- Is able to select and develop marketing strategy which will be most suitable for the current situation of the company.

Organization mode of students' individual work

The independent work of students includes:

- Individual assignment is organized in the form of product costing and pricing problems.

Evaluation of study results

-

Study course outline

No.	Title of the topic
1.	Introduction (history of marketing development, role of marketing in company management, marketing mix, strategy, marketing environment, market, demand, needs and wishes, products)
2.	Consumer behaviour in consumption market (consumer behavioural model, factors impacting consumer actions, decision making in purchasing process)
3.	Analysis of industry and competitors
4.	Strategic planning of marketing
5.	Market analysis
6.	Segmentation and selection of target market

No.	Title of the topic
7.	Product differentiation and positioning
8.	Strategy of product life cycle
9.	Strategy of price determination
10.	Distribution strategies
11.	Movement (communication process, advertisement, impacting public opinion)

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Human Resources in Multicultural Environment

(Cilvēkresursi multikulturālā vidē)

Author	Vita Balama Dr.paed., MBA
LAIS course code	VadZ2026
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	16
The number of practical classes	
Prerequisites	
Part of the study programme	General education study courses

Study course objective
The study course objective is:
- To introduce students with mobility of human resources in today's changing market conditions, effectiveness of work, problems of adaptation in the framework of intercultural communication.
- To develop skills in time management, organization and management of meetings, as well as coaching and mentoring skills.

Study results
Having acquired the study course, a student:
- Is able to identify and analyze factors that influence behaviour of human resources in multicultural environment;
- Is able to develop practical recommendation packets of diagnosed problems based on acquired theoretical knowledge and methodology.

Organization mode of students' individual work
The independent work of students includes:
- Work in groups,
- Work in pairs,
- Development and presentation of projects,
- Presentation in front of an audience,
- Discussions and debates,
- Work with newspapers and Magazines, Internet, information sources available in the library of VUAS, etc.

Evaluation of study results
The end result is made of:

- at least 70% attendance of the total amount of classes,

- successfully developed and presented course project,
- successful completion of final exam.

Study course outline

No.	Title of the topic
16.	Human resources and employment
17.	Adaptation
18.	Effectiveness of work
19.	Changes of labour market
20.	Labour law
21.	Human resources, personnel management, work environment
22.	Emotional intelligence
23.	Meetings: planning and conduct
24.	Time management
25.	Advising
26.	Coaching
27.	Mentoring
28.	Motivation

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International Reporting Standards

(Starptautiskie finanšu pārskatu sagatavošanas standarti)

Author	Justine Sofija Jaunzeme
LAIS course code	Ekon2018
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	Accounting I
Part of the study programme	General education study courses

Study course objective

The study course objective is to provide an insight into disparities among national financial accounting systems of various World's countries and into the harmonization process of financial accounting, to give students an opportunity to learn IFRS and other widely recognized international reporting standards as well as to master their practical application.

Study results

Having acquired the study course, a student:

- Has gained knowledge: student will be able: 1) to compare and classify the financial accounting systems of various World's countries, 2) to elucidate the international harmonization process of financial reporting, 3) to describe the qualitative characteristics of financial information, elements of financial statements, the criteria for recognition and the measurement bases of these elements, basic principles of financial reporting and their application. 4) to describe the contents of financial statements, 5) to compare basic IFRS with IFRS for small and medium sized entities, 6) to compare basic IFRS with International Public Sector Accounting Standards.
- Has obtained skills: student will be able: 1) to apply IFRS in preparation of company's financial report, 2) to select the most appropriate accounting policies for financial reporting, 3) to carry out the consolidation of financial statements, 4) to prepare interim financial report, 5) to prepare financial report of a small or medium sized entity, 6) to use appropriate terms and mode of expression for preparation of the notes to the financial statements.
- Has developed competencies: student will be able: 1) argue in favor and against international accounting harmonization and application of IFRS, 2) to develop accounting policy of a company, which applies IFRS, 3) to analyze and interpret financial statements, which are prepared according to IFRS, 4) to apply the knowledge acquired about IFRS in further studies as well as in a work position of an accountant, auditor or financial analyst.

Organization mode of students' individual work

The independent work of students includes:

- Students' individual assignment involves writing a term paper on the comparision of IFRS with the national accounting regulations of students' home countries.

Evaluation of study results

The end result is made of:

- Students' individual assignment 50%
- Final exam – 50%

Study course outline

No.	Title of the topic
1.	National accounting systems and their classification. International accounting harmonization. Role of IFRS in the international harmonization process
2.	The IASB's framework for the preparation of financial statements. The contents of the financial statements
3.	Property, plant and equipment
4.	Investment property
5.	Intangible assets. Biological assets
6.	Provisions, contingent assets and contingent liabilities
7.	Accounting for revenues
8.	Borrowing costs. Income taxes
9.	Accounting for government grants
10.	Accounting for leases
11.	Accounting for foreign currency transactions
12.	Consolidated financial statements
13.	Interim financial statements
14.	IFRS for small and medium-sized entities
15.	International Public Sector Accounting Standards. Summary of the course

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Economics and Informatics

(Ekonomika un informātika)

Author	Dr. sc. ing., assistant professor Raita Rollande
LAIS course code	DatZ3004
Form of evaluation	Exam
Academic credit points (ECTS credit points)	6 ECTS
The total number of contact lessons	
The number of lectures	
The number of practical classes	
Prerequisites	Computer Science Basics, Information and Business Processes
Part of the study programme	General education study courses

Study course objective
The study course objective is to introduce students to data base and website development. To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.

Study results
Having acquired the study course, a student:
- Is able to design data base conceptual model according to the problem description,
- Is able to work with data base management system MS Access,
- Is able to create database tables and describe the properties of the tables,
- Is able to create simple and complex queries in MS Access,
- Is able to design the user interface and realize it practically describing user forms in MS Access,
- Is able to create a user form based on one or more tables, one or more queries,
- Is able to create simple and complex reports,
- Is able to describe the functionality of the user forms, describing the buttons using macro,
- Is able to realize the search function in data base by one or more parameters,
- Is able to perform data import and export,
- Is able to create website using cloud-based web development platform,
- Is able to properly design and build a business website.

Organization mode of students' individual work
The independent work of students includes:
- practical works,
- student will create a database and website,
- preparation for the exam.

Evaluation of study results

The end result is made of:

- Practical works (60%)
- Exam (40%)

Study course outline

No.	Title of the topic
1.	Importance of data, data management, and data management systems. Different issues involved in the design and implementation of a database system. Data base modeling. ER diagrams.
2.	Modeling of a real problem using a database. Conceptual design: ER diagrams, functional dependencies.
3.	Physical and logical database design modeling, database modeling, relational, hierarchical, and network models.
4.	Modeling a real problem using a database. Conceptual design: ER diagrams, functional dependencies.
5.	Introduction to database management systems (DBMS). DBMS MS Access. Introduction to MS Access objects: Tables, Queries, Forms, Reports. Creating tables and adding records. Integrity rules. Designing table structures. Working with Data.
6.	MS Access objects: tables in detail - table designs, Table modifications, table wizards. Defining primary keys. Creating and editing MS Access tables.
7.	Data entering in MS Access tables. Creating a relationships within a database.
8.	Data manipulation language to query, update, and manage a database. Data definition commands. Data manipulation commands. Select queries. Advanced data definition commands. Advanced select queries.
9.	MS Access objects: Queries in detail - query design, simple queries, query syntax, formulas within queries, specialized queries, query wizards. Creating and editing MS Access queries.
10.	MS Access objects: Queries in detail - query design, simple queries, query syntax, formulas within queries, specialized queries, query wizards. Creating and editing MS Access queries.
11.	Structured Query Languages (SQL). Retrieve data using SQL. Formulate SQL queries that use functions. More complex SQL - multiple tables, linking, functions.
12.	Structured Query Languages (SQL). Retrieve data using SQL. Formulate SQL queries that use functions. More complex SQL - multiple tables, linking, functions. Creating and editing MS Access SQL queries.
13.	MS Access objects: Forms in detail – autoforms, form design, form wizards. Simple user forms and complex user forms. Forms based on the one table or more tables. Forms based on the one query or more queries. Subforms. Entering data using a form.
14.	MS Access objects: Forms in detail – autoforms, form design, form wizards. Simple user forms and complex user forms. Forms based on the one table or more tables. Forms based on the one query or more queries. Subforms. Creating and editing MS Access forms.
15.	User Interface model. User interface model design. MS Access objects: Macro.
16.	MS Access objects: Macro in detail – Actions, program flow. Creating and editing MS Access macros.

No.	Title of the topic
17.	MS Access objects: Macro in detail – Actions, program flow. Creating and editing MS Access macros.
18.	MS Access objects: Reports in detail - report wizard, report design, label reports, specialized report features and options.
19.	MS Access objects: Reports in detail - report wizard, report design, label reports, specialized report features and options. Creating and editing MS Access reports.
20.	Integrating MS Access with MS Office applications: Integrating MS Access with MS Word, MS Excel. MS Access with HTML documents and the web. Converting databases from previous versions of MS Access and other customized tools and utilities.
21.	Students complete database development.
22.	Data base presentations.
23.	Creating Website without code. Fully operational website with "drag and drop tools". How to choose a website building platform.
24.	Design website using Wix or Mozello. Design website functional model. How to choose a domain name.
25.	Templates for websites. Website content description.
26.	Website content description.
27.	Text/Graphics and Web buttons. Website navigation.
28.	Search engine.
29.	Installing plugins to get more functionality.
30.	Students complete website development.
31.	Website presentations.
32.	Course summary.

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Theory of Algorithms

(Algoritmu teorija)

Author	Mg. Sc. Comp. D. Briede
LAIS course code	Mate2002
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	6
The number of practical classes	10
Prerequisites	Mathematics, Basics of Computer Science
Part of the study programme	General education study courses

Study course objective

The study course objective is to introduce students to the most important properties of algorithms, complexity analysis and algorithm design techniques.

Study results

Having acquired the study course, a student:

- Is able to select or create the most appropriate algorithm for a task,
- Is able to analyze and evaluate the effectiveness of the algorithm.

Organization mode of students' individual work

The independent work of students includes:

- regular learning using lecture materials, literature, internet resources,
- completion of home assignments,
- preparation for the exam,
- weekly teacher consultations.

Evaluation of study results

The end result is made of:

- average grade for the home assignments (30% of total grade)
- exam grade (70% of total grade)

During the semester students have to take two tests. If the result of each test is 7 or higher, the student can choose not to write the exam. In this case exam grade is replaced by the average grade for tests.

Study course outline

No.	Title of the topic
1.	**The concept of an algorithm**. Historical introduction. Formal definition of the algorithm. Expressing algorithms. Important problem types.
2.	**Properties of algorithms**. Effectiveness, correctness, finiteness/termination, efficiency, complexity, clearness

No.	Title of the topic
3.	**Mathematical fundamentals**. Role of mathematics in analysis of algorithms. Finite and infinite series. Theorem of geometric series, examples of its use. Logarithm, power, exponent. Function dominance, theorem of dominance. Concept of order of function. Limit – upper bound, lower bound. Order of function, comparison of different orders of functions. Asymptotic notations.
4.	**Analysis of algorithm complexity**. Concept of order of growth. Basic efficiency classes (1, log(N), N, Nlog(N), N2, N3, 2N). Mathematical induction. Recurrences.
5.	**Recursive algorithms**. Recursive definition. Indirect recursion. Backtracking. Recursion tree. Mathematical analysis of recursive algorithms.
6.	**Algorithm design techniques**. Brute force algorithms and exhaustive search. Divide and conquer. Dynamic programming. Greedy technique. Examples of different problems and algorithms.

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English I

(Angļu valoda I)

Author	Lecturer, Prof. mag. transl. & terminol. Indra Grietēna
LAIS course code	Citi1005
Form of evaluation	Test
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	16
The number of practical classes	
Prerequisites	Pre-Intermediate level of spoken and written English
Part of the study programme	General education study courses

Study course objective

The study course objective is:

- To provide a working knowledge of information technologies, their structure, features and applications, as well as, further developments in IT.
- To consolidate and develop all-around practical language skills of the appropriate use of English computing terminology, language forms and functions.
- **Reading:** to develop the skills of reading for information and to introduce new content from a variety of authentic IT texts.
- **Listening:** to develop the ability to understand native speakers with various language accents talking about IT. Listening to monologue and dialogues speeches.
- **Speaking:** to develop the ability to participate in exchanges of information and opinions in the context of IT. To develop the ability to explain the features of computing, and to advise on IT problems.
- **Writing:** to develop writing skills of instructions, descriptions, explanations and formal letters about the course topics.
- **Language use:** to consolidate and extend the students` understanding and use of structures and functions of English common to IT. To encourage more natural use of newly learned language.

Study results

Having acquired the study course, a student:

- Is able to read, comprehend, understand for general information and summarize an authentic text on the course topics.
- Is able to provide definitions and explanations of the basic IT concepts included in the course.
- Is able to recognise and decode the common IT abbreviations included in the course.
- Is able either in speaking or in writing to provide advice on an appropriate computer according to the needs of the user.
- Is able to write a letter of complaint on computing problems and request for the solution of the problem.
- Is able to describe both in writing and in speaking the functions of a computer equipment, to provide instructions/ advice on operating a computer

equipmentStudents are able to understand recorded natives speakers and grasp specific information and main points on the relevant fort he course IT topics in different contexts, including business, economy, and trade.

-

Organization mode of students` individual assignments

The independent work of students includes:

- individual preparation of lexical, reading, grammar and written assignments using the course book or learning materials supplied by the teacher.
- individual selection of a text related to the course themes, processing the text and presenting in written/orally a short summary of the content and main problems.
- organisation – on the Moodle platform.

Evaluation of study results

The end result is made of:

- Attendance (at least **70 %** of the total amount of classes)
- Home / individual assignment submissions and performance
- Performance at midterm tests, performance in **Master Test** (passed/ failed) at the end of Term I (**60% gives a pass**).

Study course outline

No.	Title of the topic
1.	Computers today and their use: Computer users and Areas of application
2.	Computer architecture (Class test 1): Computer types and Computer architecture: functions, users, ethics
3.	Computer peripherals (Class test 2): Input and output devices and Data storage devices
4.	Operating systems, and jobs in ICT (Class test 3): OS types and functions; Java
5.	User–computer Interaction (Class test 4): Graphic user—computer interaction. Graphic user—computer interface characteristics
6.	Applications programs (Class test 5): Their types, Word processor, Excel spreadsheet program and Databases

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English II

(Angļu valoda II)

Author	Lecturer: Prof. mag. transl. & terminol. Indra Grietēna
LAIS course code	Citi1016
Form of evaluation	Test
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	16
The number of practical classes	
Prerequisites	Pre-Intermediate level of spoken and written English
Part of the study programme	General education study courses

Study course objective

The study course objective is:

- To provide a working knowledge of information technologies, their structure, features and applications, as well as further developments in IT.
- The course is aimed at consolidating and developing all-around practical language skills of the appropriate use of English computing terminology.
- **Reading:** to develop the skills of reading for information and to introduce new content from a variety of authentic IT texts.
- **Listening:** to develop the ability to understand native speakers with various language accents taking about IT. Listening to monologue and dialogue speeches.
- **Speaking:** to develop the ability to participate in exchanges of information and opinions in the context of IT. To develop the ability to explain the features of computing, and to advise on IT problems.
- **Writing:** to develop writing skills of instructions, descriptions, explanations and formal letters about the course topics.
- **Language use:** to consolidate and extend the students' understanding and use of structures and functions of English common IT vocabulary. To encourage more natural use of newly learned language.

Study results

Having acquired the study course, a student:

- Is able to read, comprehend, understand for general information and summarize an authentic text on the course topics.
- Is able to provide definitions and explanations of the basic IT concepts included in the course.
- Is able to recognise and decode the common IT abbreviations included in the course.
- Is able to participate in the exchange of opinions on the topics included in the course.

- Is able to understand recorded natives speakers and grasp specific information and main points on the IT topics included in the course.
- Is able both in writing and in speaking decsribe the structure, functions and use of multimedia applications, computer networks, the Internet and WWW, using appropriate language structures.

Organization mode of students` individual assignments

The independent work of students includes:

- Students' individually prepared lexical, reading, grammar and written assignments, using the course book or learning materials supplied by the teacher.
- Students' individually selected a text related to the course themes, processing the text and presenting in written/orally a short summary of the content and main problems.
- Organisation – on the Moodle platform.

Evaluation of study results

The end result is made of:

- The attendance (at least 70 % of the total amount of classes)
- Home / individual assignment submissions and performance
- Performance at midterm tests
- Performance in Master Test (passed/ failed) at the end of Term I (60% gives a pass)
- Performance in the final exam at the end of the semester

Study course outline

No.	Title of the topic
1.	Multimedia: Software for audio and video recording and playing MP3, MIDI, MPEG, JPEG
2.	Computer design and Creative software: Basic principles, Computer poligraphy and Desktop publishing
3.	Networks: Types and Internet communication
4.	Faces of the Internet: Internet services, Security and privacy and Internet user ethics
5.	WWW: Webpages, Search programs, E-mailing protocols and Internet pages
6.	Websites: Design and XML vs HTML
7.	Data protection: Malware, Digital crime and Security measures, secure data transfer
8.	Revision

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Case Tools

(Programmu izstrādes rīki un vides)

Author	Dr. sc. ing., assistant professor Raita Rollande
LAIS course code	DziT3009
Form of evaluation	Exam
Academic credit points (ECTS credit points)	6 ECTS
The total number of contact lessons	32
The number of lectures	16
The number of practical classes	16
Prerequisites	Programming, Database Technology, Information System Analysis and Design
Part of the study programme	General education study courses

Study course objective

The study course objective is to introduce students to several wide used CASE tools, their application facilities in several software development life cycle phases and to acquire practical skills in software development tools.

Study results

Having acquired the study course, a student:

- Is capable of understanding the software development tools and environment role in system development,
- Is able to use a variety of software development tools for the software development life cycle,
- Has obtained comprehensive knowledge of software development tools and environment usage,
- Is able to use project management, organizational analysis, business process analysis,
- Is able to choose an appropriate tool to automate the software development process.

Organization mode of students` individual assignments

The independent work of students includes:

- practical works. On each topic the student performs laboratory work, which should be defended.
- preparation for the exam.

Evaluation of study results

The end result is made of:

- Practical works (60%)
- Exam (40%)

Study course outline

No.	Title of the topic
1.	Software development tools and environments. Explanation of CASE tools concepts. Advantages and disadvantages of using tools. General description of software development tools. Conceptual fundamental of CASE technologies. Tools evolution, model of the software life cycle, tools content, structure and functional features. Software development project tools. General project management tools - Microsoft Project, Microsoft Visio, Workbench, etc.
2.	Project management tool Microsoft Project in project management.
3.	Project management tool Microsoft Project in project management using Waterfall and Agile project design method. IT project management tools - Jira, Microsoft Visual Studio.
4.	IT project management tools - Microsoft Project, Jira, Microsoft Visual Studio.
5.	CASE tools for Information Systems development. Classification of CASE tools. CASE tools classification by type, categories, and levels. Recently used CASE tools and their usage in several stages of software development.
6.	1st practical work. Usage of IT project management tool in Agile project management.
7.	CASE tools for diagram modelling. Entity Relationship Diagram – ERD, Data Flow Diagram - DFD, Work Flow Diagram - WFD, Organization Chart - ORG, Business Process Diagram – BPD.
8.	2nd practical work. Student presentations about IT project management tools' functionality analysis.
9.	Tools for Entity Relationship Diagram. Data base design tools, the tool options. The conceptual data model and physical data model. Code generation. Reverse engineering.
10.	2nd practical work. Student presentations about IT project management tools' functionality analysis.
11.	Data base design tools Power Designer, ToadData Modeler options in data base design.
12.	3rd practical work. Diagrams: Organization Chart, Entity Relationship Diagram, Work Flow.
13.	Business Process Modelling Language standard. Business Process Modelling Language notation (BPMN). BPMN tools.
14.	4th practical work. Students' presentation about data base design tool Power Designer and ToadData Modeler usage in data base design.
15.	Business Process Modelling. Business Process Modelling diagrams. Grade tool. Business Process Modelling language GRAPES-BM.
16.	Practical work with business process modelling tool Grade.
17.	Business process modelling tools Bizagi and ArisExpress for business process modelling using BPMN.
18.	Business process modelling with tools Bizagi and ArisExpress.
19.	Data Warehouse Design. Data warehouse structures. Data Warehouse design. Data Online Analytical Processing (OLAP). Cube structure. Cube creation using external data sources, query, multiple data sources.
20.	5th practical work. Business process modelling with tools Bizagi and ArisExpress.
21.	Business intelligence tools, retrieving data from different data sources and processing. Simple and complex report creation. Crystal Report and MS Excel business intelligence tools, dashboard development.

No.	Title of the topic
22.	Practical work with business intelligence tools: retrieving data, data analysis and output.
23.	Prototyping tools for a simple and interactive prototyping.
24.	6th practical work. Business intelligence tools.
25.	Automated generation of user interface. Applications frameworks of data-driven user interface generation. Data model specification. Analysis of application framework. Application framework comparison. Other applications frameworks.
26.	7th practical work. Prototyping tools: Lumzy, Pencil, Justinmind prototyping, Balsamiq Mockups, InVision, Marvel.
27.	Automated generation of user interface. Applications frameworks of data-driven user interface generation. Data model specification. Analysis of application framework. Application framework comparison. Other applications frameworks.
28.	Automated generation of user interface with LightSwitch.
29.	Software cost assessment tools. General review of s tools.
30.	8th practical work. Automated generation of user interface with LightSwitch.
31.	Software testing and debugging tools. Test modelling tools, GUI test driver and get/perform again tools, loading and performance tool, Non-GUI test drivers and test managers, other test implementation tools, test evolution tools, static analyze tools, defect tracing tools, Website test tools, their description. Summary.
32.	9th practical work. Software cost assessment tools.

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Computer Design

(Datordizains)

Author	Dr. sc. ing., Aleksandrs Sisojevs
LAIS course code	DatZ1001
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	16
The number of practical classes	
Prerequisites	
Part of the study programme	General education study courses

Study course objective
The course goal to provide theoretical and practical knowledge of existing computer design technology. To acquire practical skills in the use of computer graphics software for business art-design..

Study results
Having acquired the study course, a student:
- Has acquired main concepts in computer design,
- Has acquired skills for practical implementation of computer design methods, based on the existing graphics software,
- Has developed the skill to use the theoretical knowledge to solve a specific task for applied computer art-design.

Organization mode of students' individual work
The independent work of students includes:
- Independently developed computer art-design project.

Evaluation of study results
The end result is made of:
Independent tasks implementation within the prescribed deadlines. Test project independent development and defense. Regular attendance of classes.

Study course outline

No.	Title of the topic
1.	**Colours**. Colours physics and psychophysics. The light, the light spectrum. The eye structure. Colours reception. Colour models RGB, CMY / CMYK, HSV / HSL, PANTONE and their application.
2.	**Raster graphics concept.** Formats of raster graphics files (* .bmp, * .jpg, * .png, * .gif, * .tif).

No.	Title of the topic
3.	**Vector graphics concept.** Bezier curves. Formats of vector graphics files (* .svg, * .cdr, * .ai, * .ps, * .pdf).
4.	**Raster graphics software GIMP.** Desktop. Zoom tools. Area selection mechanisms. Selected areas Moving and cloning. Move tool. Software for the special effect the creation. Paintbrushes and Pensile options. Layer. Masks. Materials. Shadow, reflection, shine, different materials, the amount of collage creation techniques.
5.	**Vector graphics software Inkscape.** User interface. Zoom tools. Object selection, creation, modification, moving. Primitive. Additional tools. Work with multiple objects. Changing the contours of objects using standard tools. Bezier curves. Tools for contours. Flood Fill. Text. Page options, printing. Work with raster files. Effects. Contours. Deformation. Stroke. Extortion. Shadow. Perspective. Lens.
6.	**The concept of art - design composition.** The geometric center of the composition. Closed and open composition. Static and dynamics in visual composition.
7.	**Corporate style concept.** Basic principles of logo creation. Basic principles of business cards, document form and envelopes design.
8.	**The pre - printing processing.** The graphic images preparation for printing. Color separation process.

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Computer Architecture and Structure

(Datoru arhitektūra)

Author	Mg. sc. comp. Jānis Dzalbs
LAIS course code	
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	N/A
Part of the study programme	General education study courses

Study course objective
The study course objective is to provide knowledge of modern computer system hardware architecture and design, as well as to prepare students for practical work.

Study results
Having acquired the study course, a student:
- Have gained theoretical knowledge and practical skills about computer equipment, installation, replacement, configuration and testing.

Organization mode of students' individual work
The independent work of students includes:
- students' independent work with literature in addition to the acquisition of theoretical material,
- individual work with laboratory work result processing and evaluation.

Evaluation of study results
The end result is made of:
- Successfully performed and defended laboratory works
- Writing and presenting a report
- Passed theoretical knowledge test
- Positive mark in the exam

Study course outline

No.	Title of the topic
1.	Information on the training process. Information processing systems architecture and classification.
2.	Architecture of portable computer
3.	Motherboard structure and principles of operation, operative memory structure and principles of operation, the hard disk structure and operating principles

No.	Title of the topic
4.	Architecture of stationary computer
5.	Intel processor family, AMD processor family, ARM processor family
6.	Cloning of hard disk data
7.	NVIDIA video cards, AMD video cards, extension cards
8.	Installing of operating system
9.	External storage media, input devices, input and output ports
10.	Testing of computer
11.	Monitors, printers and scanners
12.	Recovery of deleted data on hard disk
13.	Smartphones, tablets and smart devices, game consoles, drones
14.	Creating computer network between two computers
15.	Knowledge test
16.	Computer hardware design according to objective

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Foundations of Computer Science I

(Datorzinātņu pamati I)

Author	Prof., Dr. phys. Sergejs Hiļķevičs
LAIS course code	DziT1001
Form of evaluation	Exam
Academic credit points (ECTS credit points)	6 ECTS
The total number of contact lessons	32
The number of lectures	14
The number of practical classes	18
Prerequisites	N/A
Part of the study programme	General education study courses

Study course objective

The study course objective is to provide students in fundamental knowledge in algorithm theory and relation of theory with computer hardware and software, the foundations of programming.

Study results

Having acquired the study course, a student:

- Is capable of understanding of fundamental principles of algorithm theory and abstract machines,
- Is able to understand algorithm realization using real computers
- Is able to understand formal languages theory,
- Is able to understand foundations of compilation theory,
- Is able to use different descriptions of algorithms,
- Is able to use programming tools for programmes creation,
- Is able to formulate and solve problems in algorithm theory implementations.

Evaluation of study results

The end result is made of:

- Performance in all practical works.
- Positive result in the exam.

Study course outline

No.	Title of the topic
1.	**The introduction in algorithm theory.** The history of algorithm. The first definition of algorithm. The Leibnitz problem. The second definition of algorithm. The third definition of algorithm. The Turing machine (TM). The simple TM example.
2.	**The complicated TM example**. The combination of Turing machine algorithms. The fourth definition of algorithm. The Post machine. The emulation of PM with TM and TM with PM. TM and PM equivalence.

No.	Title of the topic
3.	**Abstract calculating machines and computers.** Von Neumann machine. The von Neumann machine's working cycle. Von Neumann and PM machines equivalence. The realisation of von Neumann machines with physical devices.
4.	**Computer architecture.** The field MDS transistor. The dynamic memory element. The complement transistor pair. Trigger. Static memory element
5.	**Switch.** Decoder. Memory module K537RU1. Random access memory element. Read only memory.
6.	**Programmed logical matrix.** Arithmetical logical unit. Processor. The minimal assembler for von Neumann machine. Micro commands and micro codes. Assembler.
7.	**Markov's algorithms.** Markov normal algorithm. The application of Markov algorithm to the word. MA examples. MA self-applicability.
8.	**The theorem about the algorithmic insolvability of Markov's algorithm self-applicability identification problem.** The sequences from the theorem.
9.	**Formal grammars.** Languages and grammars. The languages classification according to Homsky. Example from natural languages. The language syntax and semantics.
10.	**Example of formal grammars – arithmetic.** Backus normal forms. Backus normal forms for programming language Pascal.
11.	**Foundations of compilation theory.** Lexical analysis. Syntax analysis. Syntax graph creation. Object code generation. The fifth definition of algorithm. The relations between algorithm theory and programming languages. The sixth definition of algorithm.
12.	**Algorithms and data structures.** Data structures. Classification of algorithms structures. Searching algorithms. Searching of element.
13.	**Binary searching.** Substring searching. Array sorting algorithms. Arrays and files sorting. Lists. Trees.
14.	The review of the course results. Sequences.
15.	**The introduction in algorithm theory.** The history of algorithm. The first definition of algorithm. The Leibnitz problem. The second definition of algorithm. The third definition of algorithm. The Turing machine (TM). The simple TM example.

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Database Technologies

(Datu bāzu tehnoloģijas)

Author	Gints Neimanis
LAIS course code	DziT3010
Form of evaluation	Exam
Academic credit points (ECTS credit points)	6 ECTS
The total number of contact lessons	32
The number of lectures	14
The number of practical classes	18
Prerequisites	Basic computer skills
Part of the study programme	General education study courses

Study course objective

The study course objective is to provide knowledge about database management systems, their history, architecture, usability, exploitation as well as to acquire practical skills in creation of databases through practical project.

Study results

Having acquired the study course, a student:

- Capable of understanding of database types, objects,
- Obtained skills to normalize data, use SQL for data manipulation and data definition,
- Is able to understand and has obtained skills to use views, transactions, stored procedures and triggers.

Organization mode of students' individual work

The independent work of students includes:

- regular studies of course material, literature and online resources,
- homework assignments and development of course project,
- consultations with lecturer.

Evaluation of study results

The end result is made of:

- Course project – 50%
- Final exam – 50%

Study course outline

No.	Title of the topic
1.	DBMS history, types.
2.	Database design and database objects (tables, relations, keys, indexes).
3.	Data normalization

No.	Title of the topic
4.	SQL. DML usage
5.	SQL. DDL and account management commands
6.	Views and transactions. ACID
7.	Stored procedures, triggers
8.	Course project presentations

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Data Structures and Algorithms

(Datu struktūras un pamatalgoritmi)

Author	Mg. sc. comp. Karina Šķirmante, Mg. sc. comp. Dace Briede
LAIS course code	DziT2005
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	Proficiency in C++
Part of the study programme	General education study courses

Study course objective

The study course objective is to provide students with information about fundamental data structures, including worst-case space/time efficiency and implementation details. Relevant algorithms related to the data structures will be covered as appropriate.

Study results

Having acquired the study course, a student:

- Is able to describe data structures from three perspectives–logical, application, and implementation,
- Is able to implement fundamental data structures such as queues, stacks, trees, heaps, graphs.

Organization mode of students' individual work

The independent work of students includes:

- regular learning using lecture materials, literature, internet resources,
- completion of home assignments,
- preparation for tests and the exam, weekly teacher consultations.

Evaluation of study results

The end result is made of:

- theory (30% of total grade)
- programming (70% of total grade)

To be allowed to take the final exam student has to submit all home assignments given during the semester and the average grade for the home assignments has to be at least 4. If the average grade of home assignments is 8 or higher, the student can choose not to write the programming part of the final exam. In this case 70% of total grade is replaced by the average grade of home assignments.

During the semester students have to take two theoretical tests. If the average result of these tests is 8 or higher, the student can choose not to write the theory part of the exam. In this case 30% of total grade is replaced by the average grade for tests.

Study course outline

No.	Title of the topic
1.	Concept of data and data type. Data structures and their classification. Commonly used data structures. Arrays. Records. Strings
2.	Lists: operations and implementation
3.	Stack and queue: implementation, operations and application
4.	Linked structures and their operations
5.	Priority queues and heaps: operations, implementation
6.	First test. Trees: terminology, binary trees, binary search trees, operations, full binary tree, balanced tree, tree traversal and implementation.
7.	Implementation of binary search tree, copying trees, trees implemented with arrays, expression trees.
8.	Graphs: basics and terminology, implementation, traversals
9.	Second test. Graphs: minimum spanning tree, shortest path

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Differential Equations

(Diferenciālvienādojumi)

Author	Dr. math., assoc. prof. Gaļina Hiļķeviča
LAIS course code	Mate2005
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	Mathematical Analysis I, Mathematical Analysis II
Part of the study programme	General education study courses

Study course objective
The study course objective is to consider various physical and geometrical problems that lead to differential equations, and to explain the most important standard methods for such equations solving.

Study results
Having acquired the study course, a student:
- Is able to demonstrate understanding of basic concepts and rules,
- Is able to derive differential equations from physical or other problems, solve these equations by standard methods, and interpret results in terms of a given problem.

Organization mode of students' individual work
The independent work of students includes:
- regular course of study substances learning through lecture materials, textbooks, internet resources,
- regular homework performance,
- weekly teacher consultations,
- students work in groups,
- preparing for the exam.

Evaluation of study results
The end result is made of:
- Exam mark - 70%
- Mid-semester mark - 30%. After each of main themes a written tests to be done, on which tasks to be solved and the questions of theory to be answered. Each task and the question are valued at a certain score, which is calculated at mid-semester grades.

Study course outline

No.	Title of the topic
1.	First-Order Differential equations. Notion about differential equation. First-Order Differential equation. Solution of first-order differential equation. General solution of first-order differential equation. Initial value problems. Existence and uniqueness of solutions. Separable differential equations. Homogeneous equations.
2.	Separable differential equations. Homogeneous equations.
3.	First-Order Differential equations. Linear differential equations. Bernoulli equations. Exact differential equations. Picard iteration for Initial value problems. Numerical methods for first-order differential equations.
4.	Linear differential equations. Bernoulli equations. Exact differential equations. Picard iteration for Initial value problems. Numerical methods for first-order differential equations.
5.	Higher Order Differential equations. Second order equations which right-hand side does not contain function. Second order equations which right-hand side does not contain argument.
6.	Second order equations which right-hand side does not contain function. Second order equations which right-hand side does not contain argument.
7.	Numerical methods for first-order differential equations.
8.	First Test.
9.	Homogeneous linear equations of second order. Fundamental theorems for the Homogeneous equation. General solution. Basis. Wronskian. Second order homogeneous linear equations with constant coefficients.
10.	Second order homogeneous linear equations with constant coefficients.
11.	Second order nonhomogeneous linear equations with constant coefficients. Method of variation of parameters. Lagrange's method.
12.	Second order nonhomogeneous linear equations with constant coefficients. Method of variation of parameters. Lagrange's method.
13.	Systems of Differential equations.
14.	Systems of Differential equations.
15.	Modelling. Radioactivity. A population model. Oscillations. Heating problem. Modelling of electric circuits.
16.	Second Test.

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Discrete Mathematics

(Diskrētā matemātika)

Author	Dr. math., assoc. prof. Gaļina Hiļķeviča
LAIS course code	Mate1012
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	6
The number of practical classes	10
Prerequisites	Mathematical Logic
Part of the study programme	General education study courses

Study course objective

The study course objective is to teach the main concepts and methods of discrete mathematics and prepare students for courses “Data structures and algorithms” and “Theory of algorithms”.

Study results

Having acquired the study course, a student:

- Is able to demonstrate understanding of basic concepts and rules,
- Is able to prove fundamental theorems of discrete mathematics,
- Is able to operate with sets and relations,
- Is able to solve standard problems of combinatory and graph theory,
- Is able to apply theoretical knowledge in real problems solving.

Organization mode of students’ individual work

The independent work of students includes:

- regular course of study substances learning through lecture materials, textbooks, internet resources,
- regular homework performance,
- weekly teacher consultations,
- students work in groups,
- preparing for the exam.

Evaluation of study results

The end result is made of:

- Exam mark - 70%
- Mid-semester mark - 30%. After each of main themes a written tests to be done, on which tasks to be solved and the questions of theory to be answered. Each task and the question are valued at a certain score, which is calculated at mid-semester grades.

Study course outline

No.	Title of the topic
1.	Sets and relations. Concept of set. Description of the set. Operations with sets. Binary relations. Operations with binary relations. Properties of binary relations.
2.	Binary relations. Operations with binary relations. Properties of binary relations.
3.	Equivalence Relation. Sets and factorsets. Ordered sets. Relations in ordered sets.
4.	Equivalence Relation. Sets and factorsets. Ordered sets. Relations in ordered sets.
5.	Functions. Injective functions, surjective functions and bijective functions. Cardinality of Sets. Continuum sets. Continuum hypothesis.
6.	Functions. Injective functions, surjective functions and bijective functions. Cardinality of Sets. Continuum sets. Continuum hypothesis.
7.	Combinatory. The law of multiplication. Permutations. Combinations. Samples and selections. Substitution group. Binomial coefficients and their properties. Binomial theorem. Creation functions.
8.	First Test.
9.	Principle of Inclusion and Exclusion. Recurrence relation. Fibonacci and Lukas numbers.
10.	Binomial coefficients and their properties. Binomial theorem. Principle of Inclusion and Exclusion. Recurrence relation.
11.	Stirling numbers. Catalan numbers. Bernoulli and Euler numbers.
12.	Fibonacci and Lukas numbers. Stirling numbers.
13.	Graph theory. Concept of graph. Isomorphic graphs. Operations with graphs. The storage of information about graphs on a computer. Graphs and binary relations. Concepts of connectivity components of a graph. Vertices index. Edges index. Bridge. K-component graphs. Menger theorem. Hall theorem. Maximal flow. Shortest path.
14.	Second Test.
15.	The concept of a tree. Trees properties. Oriented trees. Ordered trees. Binary trees. Minimal Spanning tree. The representation of tree in computer. Sorting tree. Eulerian graphs. Euler's theorem. Fluery algorithm. Eulerian Walks. Semi-Eulerian graph. Hamiltonian Graphs. Hamilton's Game.
16.	Independence and covering. Minimal covering of a graph. A colouring of a graph. The chromatic number of a graph. Five colour theorem. Planar graphs and Four Colour Problem.

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Fundamentals of Economics

(Ekonomikas pamati)

Author	Dmitrijs Smirnovs
LAIS course code	Ekon2011
Form of evaluation	Test
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	14
The number of lectures	14
The number of practical classes	
Prerequisites	N/A
Part of the study programme	General education study courses

Study course objective
The study course objective is to give students background knowledge about the market economy and the nature of the main problems, to promote the acquisition of basic knowledge about business forms, work organization and planning in enterprise, risk management.

Study results
Having acquired the study course, a student:
- Is able to explain the main economic objectives and problems,
- Has gained knowledge about country's financial system,
- Has gained knowledge about company's core operating principles, enterprise foundation and business plan preparation.

Organization mode of students' individual work
The independent work of students includes:
- regular studies of course material, literature and online resources,
- consultations with lecturer.

Evaluation of study results
The end result is made of: Positive mark in the final test.

Study course outline

No.	Title of the topic
1.	Introduction into economy. The main objectives and problems. Production resources
2.	Market mechanism. Supply and demand. Flexibility.
3.	The government economic policy and the nature of instruments of its implementation.
4.	Fiscal policy. Latvian national budget system.
5.	Taxation. Latvian taxation system.
6.	The basis for monetary policy. Central bank activity.
7.	Inflation and unemployment.

No.	Title of the topic
8.	Exchange rates and interest rates.
9.	The world economy. International relations
10.	Business essential. Business forms
11.	Business risks. Internal and external environment. Competition.
12.	Introduction to financial accounting. Balance sheet, profit and loss statement, cash flow
13.	Introduction to Management Accounting. Cost, non-profit point.
14.	Business plan. Fundraising. Company foundation

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Electronics

(Elektronika)

Author	Dr. sc. ing., assist. prof. Aigars Krauze
LAIS course code	ETel2008
Form of evaluation	Exam
Academic credit points (ECTS credit points)	6 ECTS
The total number of contact lessons	32
The number of lectures	16
The number of practical classes	16
Prerequisites	Mathematics and physics on secondary school level
Part of the study programme	General education study courses

Study course objective
The study course objective is to extend knowledge of the electrical current in conductors and semiconductor materials; operation and using of semiconductor devices (diodes, transistors, etc.). Give concept of analogue and digital electronics.

Study results
Having acquired the study course, a student:

- Is capable of understanding and describing electric current behaviour in solid state materials, electric current in semiconductors,
- Is able to understand structure, operation and usage of semiconductor electronic devices (semiconductor diodes, transistors, etc.),
- Is able toc alculate electric circuits,
- Has obtained practical skills for using basic analogue and digital electronic chips – calculate the circuits, assembly electrical scheme, perform measurements, interpret results, write a technical report.

Organization mode of students' individual work
The independent work of students includes:

- lecture notes, lecture course notes (available on the university's Moodle site), independent development, additional information acquisition in the library and on the Internet,
- lab report preparation and presentation,
- independent preparing for tests on a specific topic,
- advice from the course instructor outside of class time.

Evaluation of study results
The end result is made of:

- Three test works during the course: 1) electrotechnical basics of electronics; 2) circuits of semiconductor devices; 3) analogue and digital devices. All laboratory works must be done and presented. All 3 tests done – 40%
- Exam - 60%

Study course outline

No.	Title of the topic
1.	Electro-technical basics of electronics
2.	Basics of calculation of linear circuits, Ohm, Kirchoff law
3.	Semiconductors, electric current in semiconductors Test work – calculation of electrical circuits
4.	Semiconductor diode
5.	Bipolar junction transistors, BJT connections, operation modes. Semiconductor diode
6.	Field Effect Transistors Bipolar junction transistor
7.	Optoelectronic devices, transistor as amplifier Test work on diodes and transistor circuits
8.	Operational amplifier, basic usage. Circuits with OpAmps, calculations
9.	Basics of digital electronics, gates. Operational amplifier
10.	Basics of digital electronics, triggers, registers, memory elements
11.	AD and DA convertors. Test work on OpAmps and digital electronics
12.	Basics of microprocessor. Lab work assessment
13.	Summary of the course. Repetition of main topics for exam

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Physics I

(Fizika I)

Author	Artūrs Vrubļevskis
LAIS course code	Fizi1002
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	Mathematics and physics on secondary school level
Part of the study programme	General education study courses

Study course objective

The study course objective is to form understanding of relationships in the macroscopic world. Develop understanding of the close connection between math and physics by modelling different processes and verifying those models in practice.

Study results

Having acquired the study course, a student:

- Is capable of understanding mechanical motion of bodies, oscillations and waves,
- Has achieved proficiency in using calculus for describing physical processes and solving mechanics problems,
- Has achieved proficiency in using measuring instruments and sensors in physical experiments,
- Has achieved proficiency in executing mechanics experiments, data processing, estimating errors in measurements and results, formulating conclusions.

Organization mode of students' individual work

The independent work of students includes:

- regular studies of course material, using study literature and lecture materials,
- problems to be solved individually (assigned regularly during the semester),
- consultations with the lecturer.

Evaluation of study results

The end result is made of:

- Completed and defended 3 laboratory works (20%)
- 2 tests taken during the semester (30%)
- Homework assignments (20%)
- Exam (30%)

Study course outline

No.	Title of the topic
1.	Measurement errors. Introduction to laboratory work write-up.
2.	Quantities and units. Kinematics of a point object.
3.	Problem solving on topics from week 1. and 2.
4.	Free fall. Motion in two dimensions.
5.	Point object dynamics.
6.	Problem solving on topics from week 4. and 6.
7.	Rotational motion kinematics. Motion in gravitational field. Weight.
8.	Work, power, energy.
9.	Problem solving on topics from week 8. and 10.
10.	Momentum, collisions. Rotational motion dynamics.
11.	Undamped free oscillations. Damped and forced oscillations, resonance.
12.	Problem solving on topics from week 12. and 14.
13.	Waves, wave types and interactions.

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Physics II

(Fizika II)

Author	Artūrs Vrubļevskis
LAIS course code	Fizi1003
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	Physics I, Linear Algebra and Analytic Geometry, Calculus
Part of the study programme	General education study courses

Study course objective

The study course objective is to provide introduction to the electric and magnetic phenomena in vacuum and in media using the concepts of electric and magnetic fields. Develop understanding of direct and alternating current in different media and of the close connection between electric and magnetic phenomena.

Study results

Having acquired the study course, a student:

- Is capable of understanding electric and magnetic phenomena at macroscopic and microscopic scales,
- Has gained proficiency in using calculus for describing electric and magnetic processes,
- Has gained proficiency in solving problems concerning electromagnetism,
- Has gained proficiency in using measuring instruments and sensors in physical experiments,
- Has gained proficiency in planning and executing experiments in electromagnetism, data processing, estimating errors in measurements and results.

Organization mode of students' individual work

The independent work of students includes:

- regular studies of course material, using study literature and lecture materials,
- problems to be solved individually are assigned regularly during the semester,
- consultations with the lecturer.

Evaluation of study results

The end result is made of:

- Completed and defended 3 laboratory works (20%)
- 2 tests taken during the semester (30%)

- Homework assignments (20%)
- Exam (30%).

Study course outline

No.	Title of the topic
1.	Introduction to laboratory work write-up
2.	Electric charges. Coulomb's law
3.	Problem solving on topics from week 2
4.	Electric field. Gauss's law and its application
5.	Work, potential energy, and electric potential. Relationship between electric field and potential. Conductors and dielectrics in electric field. Capacity, capacitors. Electric field energy
6.	Problem solving on topics from week 4 and 6
7.	Direct current. Ohm's law for a circuit element. Electromotive force. Ohm's law for a closed circuit. Kirchhoff's rules
8.	Magnets and magnetism. Lorentz force. Motion of a charged particle in magnetic field. Magnetic properties of currents. Ampere's law
9.	Problem solving on topics from week 8 and 10
10.	Electromagnetic induction. Self-inductance, inductance, mutual inductance, magnetic field energy, transformer
11.	Alternating current, phasor diagrams, RLC circuits. Electric oscillations in LC circuits
12.	Problem solving on topics from week 12 and 14
13.	Maxwell's equations, displacement current, electromagnetic waves. Light as an electromagnetic wave

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Modeling of Chaotic Processes

(Haotisku procesu modelēšana)

Author	Asoc. prof., dr. habil. phys. Juris Žagars
LAIS course code	DziT3006
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	14
The number of practical classes	2
Prerequisites	Differential Equations
Part of the study programme	General education study courses

Study course objective

The study course objective is to introduce with the basics of the theory of chaos as well as with its applications for modelling of non-linear dynamic systems. Course is started with introduction of the theory of chaos in connection with the problems of modelling non-linear dynamic systems. The basic ideas are explained mainly by use of the one dimensional iterative maps under conditions when their behaviour becomes chaotic. The explanation is given for attractors, fractals, bifurcations and other key characteristics of chaos, as well as extrapolation of time series having high importance for modelling of chaotic processes.

Study results

Having acquired the study course, a student:

- Is capable of understanding the different forms of expression of chaotic behaviour and their modelling paradigm,
- Is able to estimate the paradigms influence on methods of mathematical modelling,
- Isa capable of explaining different scenarios of chaotic transition, so-called “butterfly effect” and related effects of chaotic behaviour,
- Is able to develop and compare the technologies of modelling for regular and chaotic processes.

Organization mode of students’ individual work

The independent work of students include:

- Students has to accomplish individual (or in group) programming exercise (in MATLAB, Scilab or OCTAVE media) with modelling chaotic behaviour of non-linear dynamic process.

Evaluation of study results

The end result is made of:

- The mark of the exam is not below 4
- The assessment of individual assignment is positive

Study course outline

No.	Title of the topic
1.	Continuous modeling.
2.	Discreet modeling.
3.	Butterfly effect.
4.	Periodic trajectories.
5.	Logistic map and tents map.
6.	Bifurcations of the logistic map.
7.	Fractal dimension.
8.	Atractors population and dimensions.
9.	Chaotic transitions.
10.	Fractal compression of digital images.
11.	Chaos in continuous systems.
12.	Chaos in oscillating systems.
13.	Chaos in conservatives systems.
14.	Controlling of chaotic systems.
15.	Analysis of individual assignment

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Introduction to Computer Processing of Satellite Images

(Ievads satelītattēlu apstrādē)

Author	Linda Gulbe
LAIS course code	
Form of evaluation	Exam
Academic credit points (ECTS credit points)	6 ECTS
The total number of contact lessons	32
The number of lectures	15
The number of practical classes	17
Prerequisites	Linear Algebra and Mathematical Analysis
Part of the study programme	General education study courses

Study course objective
The study course objective is to acquaint Bachelor's students with multispectral satellite image processing and to provide practical skills in image processing methods and their implementation ensuring theoretical and practical knowledge for remote sensing tasks.

Study results
Having acquired the study course, a student:
- Has gained knowledge about image processing basics and most common image processing methods,
- Is capable of uderstanding opportunities and limitations of remote sensing data processing,
- Is able to understand the process for choosing methodology for solving different environmental problems using multispectral satellite data,
- Has obtained skills to perform multispectral satellite image pre-processing,
- Has obtained skills to perform multispectral satellite image enhancement and transformations,
- Has obtained skills to perform multispectral satellite image classification.

Organization mode of students' individual work
The independent work of students include:
- work with literature and internet resources,
- preparing coursework about some environment-monitoring problem using multispectral satellite data.

Evaluation of study results
The end result is made of:
- Coursework and exam (not less than 4 in a ten-grade system)
- Final grade: 50 % exam grade, 50 % coursework grade. If grade for coursework is higher than 8 and student have accomplished at least 75% of practical tasks

during the lessons, then student can choose not to write an exam and to get coursework grade as final grade.

Study course outline

No.	Title of the topic
1.	Introduction in remote sensing, multispectral satellite images
2.	Satellite images and GIS
3.	Pre-processing: image geometrical corrections
4.	Pre-processing: pixel value corrections
5.	Image enhancement: contrast improvement
6.	Image enhancement: image filtering, pseudo colours
7.	Image arithmetic
8.	Unsupervised classification: k-means, FCM
9.	Supervised classification: training data
10.	Supervised classification: kNN, GML, SVM, Spectral Angle Mapper
11.	Supervised classification: accuracy assessment
12.	Principal components
13.	Mixed pixel analysis
14.	Object identification: specialised algorithms, template matching, segmentation methods
15.	Presentations of coursework

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Information Systems Security

(Informācijas sistēmu drošība)

Author	Aleksandrs Berežnojs
LAIS course code	DziT2017
Form of evaluation	Test
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	Basic knowledge of Computer Networking and System Administration, Fundamentals of Logical Operations, basic computer skills
Part of the study programme	General education study courses

Course group

Study course objective

The study course objective is to provide fundamentals in the field of information security, explain general concepts of data protection, share initial knowledge on security network services, devices and network traffic. To help in acquiring the specific skills needed for basic security services implementation.

Study results

Having acquired the study course, a student:

- Is capable of understanding of infrastructure, application, and operational security,
- Has obtained skills to apply information security concepts in protecting corporate information resources,
- Is capable of understanding the fundamental concepts of information security,
- Is capable of understanding threats and vulnerabilities,
- Is capable of understanding of access control and account management,
- Is capable of understanding of certificate management,
- Has gained knowledge on managing data and application security,
- Has gained knowledge on managing network security,
- Has gained knowledge on managing security incidents,
- Is able to implement compliance and operational security controls,
- Has obtained skills of security risk management,
- Has obtained skills of business continuity and disaster recovery planning.

Organization mode of students' individual work

The independent work of students include:

- periodic studies of course material using literature and online resources;
- attending course related webinars;

- homework assignments;
- advisory on demand.

Evaluation of study results

The end result is made of:

- Homework assignments - 50%;
- Final test - 50%.

Study course outline

No.	Title of the topic
1.	Information security fundamentals.
2.	Security threats and vulnerabilities.
3.	Managing data and application security.
4.	Managing networking security.
5.	Access control, xzauthentication, authorization and account management.
6.	Managing certificates.
7.	Compliance and operational security.
8.	Managing security risks.
9.	Managing security incidents.
10.	Managing business continuity and disaster recovery.
11.	Interactive work on home assignments.

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Information Systems Analysis and Design

(Informācijas sistēmu analīze un projektēšana)

Author	Dr. sc. ing., assistant prof. Raita Rollande
LAIS course code	DziT2015
Form of evaluation	Exam
Academic credit points (ECTS credit points)	6 ECTS
The total number of contact lessons	32
The number of lectures	16
The number of practical classes	16
Prerequisites	N/A
Part of the study programme	General education study courses

Study course objective

The study course objective is to introduce students to design theoretical aspects of information systems analysis and design, and to develop practical skills in information systems development.

Study results

Having acquired the study course, a student:

- Is capable of understanding the role of design in the development of information systems.
- Is capable of understanding the software development stages, models and works to be executed in each phase, phase deliverables and documentation.
- Is able to choose the information systems development model based on the characteristics of the developed system.
- Is able to apply the information system design standards, create the concept description, software requirements specifications description, and software design description documentation.
- Is able to develop a system's prototype or a simple system described by the concept description, software requirements specifications description, and software design description documentation.
- Is able to create test cases for software systems testing.
- Is able to present the project for large audience.

Organization mode of students' individual work

The independent work of students include:

- teamwork. Based on the proposed problem, students in groups develop: a description of the concept, software requirements specification, software design description of the system, design prototypes, carry out testing,
- preparation for the exam.

Evaluation of study results

The end result is made of:

- Teamwork (50%)
- Exam (50%)

Study course outline

No.	Title of the topic
1.	General conception of information system analysis and design. Types of information systems. Work characteristics of information system analysts, consultants, and experts.
2.	Information system architecture. Information system development. Information system life cycle models (waterfall life cycle model, shell model; rapid prototyping model, etc.). Agile modeling.
3.	Agile modeling in information system development. Types of agile modeling. Organization analysis. Organization management. Organization culture. System contractors' rights and obligations.
4.	With the development of information systems related to professional standards.
5.	System requirements collection methods. Interviews. Interviews organization. Questions formation. Interview process. Summing up and analysis of acquired data.
6.	Agreements. Types of agreements. Information system documentation standards. Software development standards. Software engineering standards. Necessary documentation for software usage and maintenance.
7.	The use of diagrams in information system analysis and design. Organization diagrams, entity relationship diagrams, data flow diagrams, business process diagrams. CASE tools for software development.
8.	The use of diagrams in information system analysis and design.
9.	Information systems documentation - concept description. Content of the concept description.
10.	Meeting with system contractors. Clarification of issues related with concept description development.
11.	System requirements analysis. Prototypes. The role of prototype in information system design.
12.	Concept description presentation and delivery.
13.	Information systems documentation - software requirements specification description. Content of the software requirements specification description.
14.	Analysis of concept description, discussions.
15.	Meeting with system contractors. Clarification of system requirements.
16.	System development. Using a prototype in system design.
17.	Development of software requirement specification.
18.	Development of requirement specification. Tools for prototype development.
19.	Information systems documentation - software design description. Content of the software design description.
20.	Presentation of software requirement specification and delivery.
21.	Information system testing. Verification and validation. Planning of testing. Method of testing. Testing process.
22.	Analysis of software requirements specification, discussions.

No.	Title of the topic
23.	Meeting with system contractors to get information for development of software design description.
24.	Development of software design description.
25.	Information system user guide. User guide for programmer and for end user.
26.	Presentation of software design description and delivery.
27.	Quality guarantee. Effective exploitation of time resources. Costing management. Customer satisfaction.
28.	Analysis of software design description, discussions.
29.	Information system implementation and maintenance. Information system maintenance and service contract.
30.	Preparation of the final presentation.
31.	Course summary.
32.	System presentation to system contractors.

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Fundamentals of JAVA Programming

(Programmēšana pamati JAVA)

Author	Mg. sc. comp. Karina Šķirmante
Course Code	DatZ1027
Form of evaluation	Exam
Credit point (ECTS credit points)	4 (6 ETCS)
Prerequisites	n/a
Course group	Industry study course

Study course objective

To acquire basic knowledge of algorithms and program development process. Learn algorithmic thinking. Understand and be able to apply procedural programming approach to program development process by using the programming language JAVA.

Learning Outcomes

- Able to develop applications (programs) using the programming language JAVA in accordance with good programming practice.
- Able to detect and correct errors in the source code.
- According to requirements of the problem are able to find an appropriate solution and to justify it.
- Able to analyze and explain the JAVA source code.
- Able to work independently with literature and internet resources.

Organization mode of students' individual work

Systematic work during semester includes:

- regular learning using lecture materials, literature, internet resources,
- completion of home assignments,
- preparation for tests and the final exam,
- weekly teacher consultations.

Evaluation of learning outcomes

Course assessment consists of three parts:

- average grade for the home assignments (30% of total grade)
- average grade for the theoretical tests (20% of total grade)
- exam grade (50% of total grade)

During the semester students have to take two practical tests. If the result of each test is 8 or higher, the student can choose not to write the exam. In this case exam grade is replaced by the average grade for practical tests.

Study course outline

Week	Topic and subtopic	**Type** (lecture, seminar, laboratory work)
week1 day1	Introduction to programming; Creating JAVA programs; Compiling and executing a program; Dealing with errors; Comments;	Lecture and seminars
week1 day2	Variables, arithmetic operators and their priorities; Usage of System.in and System.out classes for input/output; Logical operators, making decisions: if statement.	Lecture and seminars
week1 day3	Loops for, while, do-while, operators break and continue; Making decisions: switch statement.	Lecture and seminars
week1 day4	Theoretical test No.1; Practical exercises;	Seminar, test
week2 day1	Initializing and using arrays; Initializing and using two-dimensional arrays.	Lecture and seminars
week2 day2	Defining a function; Arguments and parameters of a function; Returning values from functions; Functions with no returning value; Variable scope.	Lecture and seminars
week2 day3	Theoretical test No.2; Practical test No.1	Seminars, tests
week2 day4	Basic concepts of Object-oriented programming (OOP); Class as an abstract data type. Object as a class instance; Class implementation in the programming language JAVA; Access levels; Encapsulation and hiding.	Lecture and seminars
week3 day1	Constructors; The default constructor; Overloaded constructors	Lecture and seminars
week3 day2	Various associations between classes, such as a-kind-of, part-of, has-a; Using UML use to represent association between classes; The composition and aggregation; Inheritance: the base class and inherited class.	Lecture and seminars
week3 day3	Practical exercises	Seminars
week3 day4	Theoretical test No.3; Practical test No.2	Tests

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Computer Systems Hardware and Architecture

(Datorsistēmu arhitektūra un uzbūve)

Author	mg. sc. comp. Jānis Dzalbs
LAIS course code	DziT1003
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	N/A
Part of the study programme	General education study courses

Study course objective
The study course objective is to provide knowledge of modern computer system hardware architecture and design, as well as to prepare students for practical work.

Study results
Having acquired the study course, a student:
- Has acquired theoretical knowledge and practical skills about computer equipment, installation, replacement, configuration and testing.

Organization mode of students' individual work
The independent work of students include:
- students' independent work with literature in addition to the acquisition of theoretical material
- individual work with laboratory work result processing and evaluation.

Evaluation of study results
The end result is made of:
- Successfully submitted and defended laboratory works
- Writing and presenting a report
- Pass theoretical knowledge test
- Positive mark in the exam

Study course outline

No.	Title of the topic
1.	Information on the training process. Information processing systems architecture and classification.
2.	Architecture of portable computer

No.	Title of the topic
3.	Motherboard structure and principles of operation, operative memory structure and principles of operation, the hard disk structure and operating principles
4.	Architecture of stationary computer
5.	Intel processor family, AMD processor family, ARM processor family
6.	Cloning of hard disk data
7.	NVIDIA video cards, AMD video cards, extension cards
8.	Installing of operating system
9.	External storage media, input devices, input and output ports
10.	Testing of computer
11.	Monitors, printers and scanners
12.	Recover of deleted data on hard disk
13.	Smartphones, tablets and smart devices, game consoles, drones
14.	Creating computer network between two computers
15.	Knowledge test
16.	Computer hardware design according to objective

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Basics of IT Industry Rules, Regulations, Standards

(Nozares tiesību pamati)

Author	M. iur., M. jud. expert, forensic Aigars Evardsons
LAIS course code	JurZ3008
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	N/A
Part of the study programme	General education study courses

Study course objective

The study course objective is to provide knowledge about information and communication framework, accountability types of information and communications. Build skills for application of the rules, the use of information and communications.

Study results

Having acquired the study course, a student:

- Has acquired the basics of information and communication rules,
- Has acquired basic skills in working with the relevant legal provisions and the ability to apply them to specific factual circumstances.

Organization mode of students' individual work

The independent work of students include:

- regular course substances learning through lecture materials, textbooks and online resources,
- continuous practical enforcement of consultation with teachers.

Evaluation of study results

The end result is made of:

- Participation in lectures
- Seminars - 50%
- Developed and defended 4 (four) practical tasks - 50%

Study course outline

No.	Title of the topic
1.	The Constitution of the Republic of Latvia
2.	Conditions of engagement
3.	Information, its life legislation, concepts and terms, liability and their types
4.	Traditional and electronic documents, requirements documents the development of responsibility and their types

No.	Title of the topic
5.	Freedom of Information and Protection. Personal Data Protection and its types
6.	Intellectual property, copyright and protection, responsibility and their types
7.	Communication, its ways and means, concepts and terms
8.	Telecommunications activity regulation
9.	Information systems, databases and security
10.	Legal liability, types of information and communications

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Linear Algebra and Analytical Geometry I

(Lineārā algebra un analītiskā ģeometrija I)

Author	Lecturer, MS in math. Jeļena Mihailova
LAIS code	Mate1003
Type of evaluation	Exam
Credit points (ECTS)	2 credit points (3 ECTS)
Prerequisites	Mathematics on the Secondary school level
Course group	

Study course objective
The course objective is to acquire the main concepts, methods and results of linear algebra, vector algebra and complex numbers and to learn to use them in solving practical tasks.

Study results

- Student will be able to take basic operations of matrix and evaluate the determinants. Able to determine the matrix rank. Able to find the inverse of a matrix. Able to solve the matrix equations. Able to solve linear systems by Cramer's rule, by finding the inverse of the coefficient matrix, by Gaussian elimination.
- Able to take operations with vector in the space R^2 and R^3.
- Able to take operations on vectors in component form. Able to understand in details the dot product, the cross product, the scalar triple product and able to apply it in practical tasks. Able to understand the vector of linear combinations and linear independence.
- Able to perform the operations with complex numbers algebraic, polar and exponential forms.

Organization mode of students' individual work
Regular course of study substances learning through lecture materials, textbooks, internet resources. Regular homework performance. Weekly teacher consultations. Students work in groups. Preparing for the exam.

Evaluation of study results
After each of the main themes, a written tests to be done, on which tasks to be solved and the questions of theory to be answered. Each task and the question are valued at a certain score, which is calculated at mid-semester grades. Study course final mark consists of two parts: a mid-semester mark - 30% and exam mark - 70%.

Study course outline

1. **Matrices. Determinants. Linear systems (16 h)**. Introduction to Matrices and Linear Systems. Matrix types. Determinants of a matrix. Determinants of order 2 and of order 3. Properties of the determinant. Minors and cofactors. Determinants of matrices of higher order. General formula for the determinant.
   Cramer`s Rule to solve the linear systems. Basic operation of matrix (adding, subtracting, multiply of a matrix by a constant). Multiplication of matrices.

Algebraic properties of matrix operations. Invertible matrix. Finding the inverse A^{-1} of the invertible $n\times n$ matrix A. Matrix equations. Solving the linear system by finding the inverse of the coefficient matrix. Elementary operations on the matrix. Gaussian elimination. Solving the linear systems by Gaussian elimination. The rank of a matrix. Kronecker-Capelli's theorem. Homogeneous systems.

2. **Vector algebra (11 h).** Definition of a vector. Types of vectors. Operations on vectors (adding, subtracting, multiply by a scalar). Properties of these operations. Projection of a vector. Vectors in two- and three-dimensional Cartesian coordinates. The component of a vector. Operations on vectors in component form. The dot product. The cross product. The scalar triple product.
3. **Complex Number (5 h).** Complex number basic definitions and arithmetic. The complex plane. The polar form of a complex number. Euler`s formula. Operations with complex numbers algebraic, polar and exponential forms.

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Linear Algebra and Analytical Geometry II

(Lineārā algebra un analītiskā ģeometrija II)

Author	Lecturer, MS in math. Jeļena Mihailova
LAIS code	Mate1011
Type of evaluation	Exam
Credit points (ECTS)	2 credit points (3 ECTS)
Prerequisites	Linear Algebra and Analytic Geometry I, Mathematics on the Secondary school level
Course group	

Study course objective

The course objective is to acquire the main concepts, methods and results of linear algebra and analytic geometry, and to learn to use them in solving practical tasks.

Study results

- Student will be able to recognize the coordinate system in plane and space and understanding of the relationship between the different coordinates.
- Able to write the line equation in the plane. Able to write the straight-line equation in plane. Able to transform the general equation of a conic section into standard form.
- Able to understand the concept of lines and surfaces in space, the so-called simpler than the other round surfaces. Able to write an equation for the straight line in space, the plane equation.
- Able to understand the concepts of the linear spaces and linear transformation. Able to find the matrix eigenvalues and eigenvectors.

Organization mode of students' individual work

Regular course of study substances learning through lecture materials, textbooks, internet resources. Regular homework performance. Weekly teacher consultations. Students work in groups. Preparing for the exam.

Evaluation of study results

After each of the main themes, a written tests to be done, on which tasks to be solved and the questions of theory to be answered. Each task and the question are valued at a certain score, which is calculated at mid-semester grades. Study course final mark consists of two parts: a mid-semester mark - 30% and exam mark - 70%.

Study course outline

1. **Coordinate Systems (4h)**. Cartesian coordinate system. Right angle and polar coordinates. Cylindrical, polar and spherical coordinates.
2. **Line in plane (14 h).** Line in the plane and its equation; polar equations. Parametric equations of line. Straight-line in plane, its equation and direction coefficient. Angle between straight lines. General straight-line equation and its line segment equation. Intersection of straight lines, conditions of parallelism and congruence.

Normal equation of straight line. Distance from the point to the straight line. The conic sections: the ellipse the hyperbola, the parabola (form, properties, asymptotes and directrix); general form and standard form. The conic sections polar equations. Transforming the general equation of a conic section into standard form.

3. **Lines and surfaces in space (7 h).** Plane equation in space, its special cases. Plane equation of line segments. Normal equation of plane, distance from the point to the plane. Equation of a straight line in the space, its canonical and parametric forms. Line intersection. Algebraic and transcendental lines. Equations of surface and line in the space. Cylindrical and conical surfaces. Parametric form (in space) of line and surface equations. Surface and line intersection. Second-order surfaces and their canonical reduction. Ellipsoid. One-sheet and two-sheet hyperboloid. Second-order cones and cylinders. Elliptic and hyperbolic parabolic.
4. **Linear operators (7 h).** Concept of the linear space and Euclidean space, their properties. Isomorphism. Linear combinations and linear independence. Bases of n-dimensional vector space, its transformation. Orthogonal transformation. Concept of linear transformations. Matrix transformations. Properties of linear transformations. Coordinates and change of basic. Eigenvectors and eigenvalues of linear operators.

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Local Area Networks Designing and Administration

(LAN projektēšana un administrēšana)

Author Mārcis Koloda
LAIS code DziT2007
Type of evaluation Exam
Credit points (ECTS) 4 credit points (6 ECTS)
Prerequisites N/A
Course group

Study course objective
The course aims to provide theoretical knowledge and practical skills for local area networks designing and administration, network architecture, network elements, technologies and protocols operating principles, design, administration, network security and management of general principles.

Study results
During training course the students will gain theoretical knowledge and practical skills in a local area network installation and configuration. Gain insight into network technologies, security principles and its structure.

Organization mode of students' individual work
The course consists of a theoretical part (lectures), practical part (laboratory work) and independent part (tests on the local network transmission technology solutions). Practical work, students acquire the skills and abilities to install and configure the local network equipment and perform related network equipment element measurements and simulations.

Evaluation of study results
Completed laboratory work, presented individual work, tests and examination.

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, laboratory work)
1	Introduction of local area networks and its history.	Lecture, laboratory work
3	ISO/OSI reference model.	Lecture, laboratory work
4-5	OSI Model Physical Layer. Included technology and standards.	Lecture, laboratory work
6-7	OSI Model Data Link layer. The principle of operation, technology and standards.	Lecture, laboratory work
8-9	OSI model Network layer. Standards, protocols and IP addresses operations.	Lecture, laboratory work
10-11	OSI model Transport layer. Standards, flow assurance.	Lecture, laboratory work

12	OSI model Session Layer.	Lecture, laboratory work
13	OSI model Presentation Layer. Data presentation technologies.	Lecture, laboratory work
14	OSI model Application Layer.	Lecture, laboratory work
15-16	The final presentation of individual work	Seminar

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Mathematical Analysis I

(Matemātiskā analīze I)

Author	Dr. math., assoc. prof. Gaļina Hiļķeviča
LAIS code	Mate1001
Type of evaluation	Exam
Credit points (ECTS)	4 credit points (6 ECTS)
Prerequisites	Mathematics on the secondary school level
Course group	

Study course objective
The main purpose of the course is to teach students to main methods of mathematical analysis and it's applications for different processes investigation.

Study results
After this course students will be able to, demonstrate understanding of basic concepts and rules, to solve standard problems of mathematical analysis (finding function limit, derivate functions, integrate functions, construct function graphics, etc.), to apply theoretical knowledge in real problems solving.

Organization mode of students' individual work
Regular course of study substances learning through lecture materials, textbooks, internet resources. Regular homework performance. Weekly teacher consultations. Students work in groups. Preparing for the exam.

Evaluation of study results
After each of main themes a written tests to be done, on which tasks to be solved and the questions of theory to be answered. Each task and the question are valued at a certain score, which is calculated at mid-semester grades. Study course final mark consists of two parts: a mid-semester mark - 30% and exam mark - 70%.

Study course outline

Week	Topic and subtopic	**Type** (lecture, seminar, laboratory work)
1	1. INTRODUCTION 1.1. Real Numbers. The real number system. The real line. The absolute value of a number. Bounded and unbounded sets. Intervals in R. 1.2. Functions. The concept of a function. Composite function (a function of a function). Inverse functions. Bounded and unbounded functions. Even and odd functions. Periodic functions. Graphs of function. Infinite sequences.	1 lecture and 1 seminar
2	1.3. The Limit of Function. The concept of a limit of function. Unique theorem. The limit of a sum. The	1 lecture and 1 seminar

	limit of a product. The limit of a quotient. The limit of a composite function. The Squeeze Theorem. One-sides limits. Convergence of Infinite sequences.	
3	1.4. Continuity. Continuous function at a point. Continuity of a sum, of a product and of a quotient. Continuity of composite function. Points of discontinuity. Properties of continuous functions.	1 lecture and 1 seminar
4	2. THE DIFFERENTIAL CALCULUS 2.1. The Derivative of a Function and differentials. Differentiability of a function. The derivative of a function, it's geometric and mechanics interpretations. Continuity of a differentiable function. Differentiability of a sum, of a product and of a quotient.	1 lecture and 1 seminar
5	Differentiability of composite function (The Chain Rule). Differentiability of inverse function. Derivatives of some Elementary Functions. Higher order derivatives. Mechanics interpretation of second order derivatives.	1 lecture and 1 seminar
6	2.2. Fundamental Theorems of Calculus. Applications of Derivatives. Rolle's Theorems, Lagrange's Theorem (The Mean Value Theorem) and Cauchy's Theorem. L'Hospital's Rule. Taylor's theorem.	1 lecture and 1 seminar
7	Increasing and decreasing functions. Local maximum and local minimum. Fermat's Theorem. Absolute (global) maximum and absolute (global) minimum.	1 lecture and 1 seminar
8	The Closed Interval Method. Concave upward and concave downward functions. Points of inflection. Derivatives and the Shapes of Curves.	1 lecture and 1 seminar
9	3. INTEGRALS 3.1. Indefinite Integrals. A primitive (antiderivative) of function. Indefinite integral. Properties of indefinite integrals.	1 lecture and 1 seminar
10	Integration by substitution. Integration by parts.	1 lecture and 1 seminar
11	Techniques of integration.	1 lecture and 1 seminar
12	3.2. Definite Integrals. The problem of areas. The definite integral. Properties of the definite integrals. Connection between definite integrals and antiderivatives.	1 lecture and 1 seminar
13	Variable limits of integration. Evaluation Theorem. Integration by substitution. Integration by parts.	1 lecture and 1 seminar
14	3.3. Applications of Integration. The area between two curves. Volumes. Arc length. The area of a	1 lecture and 1 seminar

	surface of revolution. Applications to Physics (Moments and Centers of Mass. Work and energy).	
15	3.4. Improper integrals. The concept of improper integral. A Comparison Test for Improper Integrals. Absolutely convergent integrals.	1 lecture and 1 seminar
16	4. INFINITE SERIES OF CONSTANTS 4.1. Infinite series of constants. Partial sum of the infinite series. Convergence and sum for infinite series. Remainder. The nth term test (convergence's necessary condition). Harmonic series. Series of nonnegative terms. Testing with an integral. Testing by comparing. The limit comparison test. The ratio test and root test. The alternating series test. Absolute convergence. Rearrangements of series. Conditional convergence.	1 lecture and 1 seminar

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Mathematical Analysis II

(Matemātiskā analīze II)

Author Dr. math., assoc. prof. Gaļina Hiļķeviča
LAIS code Mate1010
Type of evaluation Exam
Credit points (ECTS) 2 credit points (3 ECTS)
Prerequisites Mathematical Analysis I
Course group

Study course objective
The main purpose of the course is to generalize the main methods of one variable functions mathematical analysis for many variables and to teach students to use appropriate methods for practical problems solving.

Study results
After this course students will be able to demonstrate understanding of basic concepts and rules, to solve standard problems of mathematical analysis (represent functions in Fourier and Taylor series, find limit of many variables functions, find partial derivates, integrate many variables functions, etc.), to apply theoretical knowledge in real problems solving.

Organization mode of students' individual work
Regular course of study substances learning through lecture materials, textbooks, internet resources. Regular homework performance. Weekly teacher consultations. Students work in groups. Preparing for the exam.

Evaluation of study results
After each of main themes a written tests to be done, on which tasks to be solved and the questions of theory to be answered. Each task and the question are valued at a certain score, which is calculated at mid-semester grades. Study course final mark consists of two parts: a mid-semester mark - 30% and exam mark - 70%.

Study course outline

Week	Topic and subtopic	**Type** (lecture, seminar, laboratory work)
1	1. SEVERAL VARIABLES FUNCTIONS DIFFERENTIAL CALCULUS 1.1. Function of Several Variables. N-argument function. The graph of two-argument function. Level curves. Threeargument function. Level surfaces. Many variables function limit and continuity.	Lecture
2	Function of Several Variables. The graph of two-argument function. Level curves. Three-argument function. Level surfaces. Many variables function limit and continuity.	Seminar

3	1.2. Several Variables functions differentiability. Partial derivative. Tangent plane. The geometric interpretation of two argument function differential. Direction derivative. Gradient. Theorem on indirect defined function existence and differentiation. Partial derivatives of indirect function.	Lecture
4	Partial derivative. Tangent plane. Partial derivatives of indirect function.	Seminar
5	1.3. High orders derivatives and differentials. Mixed derivatives equality. Two argument function Taylor formula. 1.4. Several Variables functions extremums. Maximum and minimum definitions. Extremum necessary condition. Two variables function maximum and minimum enough conditions.	Lecture
6	High orders derivatives and differentials. Several Variables functions extremums.	Seminar
7	Maximal and minimal value determination. Conditional extremums.	Lecture
8	Test.	Seminar
9	2. MANY VARIABLES FUNCTIONS INTEGRAL CALCULUS. 2.1. Double and Triple Integrals. Double integral definition. The continuous function inerrability. Double integral calculation using repeated integration. Variables change in double integral. Double integral in polar system. Triple integral definition. Variables change in triple integral. Triple integral in cylinder and spherical coordinates.	Lecture
10	Double integral calculation. Triple integral calculation.	Seminar
11	2.2. Multiple Integrals applications. The calculation of body volume. The calculation of smooth surface area. Rotational surface area. Implementations in physics. 2.3. Line Integrals. The problem of variable force work on flat plane. Linear integral definition. Linear integral calculation. Green’s formulas. Path independent linear integrals.	Lecture
12	The calculation of body volume. The calculation of smooth surface area. Rotational surface area. Linear integral calculation.	Seminar
13	3. INFINIVE SERIES. 3.1. Sequences and series of functions. Convergence set. Uniform convergence. Uniform and absolute convergences conditions. Continuous functions	Lecture and seminar

	uniformly convergent series sum. Series integration and differentiation. 3.2. Power Series. The concept of a power series. The interval of convergence. Radius of convergence. Differentiation and integration of power series. 3.3. Representations of Functions as Power Series. Taylor series. Approximate functions and integrals computations using Taylor series.	
14	Test.	Seminar
15	3.4 Trigonometric series. The representation of functions as trigonometric sets. Orthogonal and orthonornals systems of functions. Fourier coefficients and Fourier series. Averaged convergence.	Lecture
16	Trigonometric series.	Seminar

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Mathematical Logic

(Matemātiskā loģika)

Author Dr. math., assoc. prof. Gaļina Hiļķeviča
LAIS code Mate1005
Type of evaluation Exam
Credit points (ECTS) 2 credit points (3 ECTS)
Prerequisites Mathematics on the secondary school level
Course group

Study course objective
The main purpose of the course is to consider Propositional calculus and Predicate calculus as foundations of logic. The course contains the consideration of languages formalisation, mathematical theories formalisation and axiomatic approach to formal theories.

Study results
After this course students will be able to demonstrate understanding of basic concepts and rules, to use operations of mathematical logic for statements logical structure description, to use mathematical logic methods for verification of statements correctness. Students will be able to use axiomatic methods for mathematical theories formalization.

Organization mode of students' individual work
Regular course of study substances learning through lecture materials, textbooks, internet resources. Regular homework performance. Weekly teacher consultations. Students work in groups. Preparing for the exam.

Evaluation of study results
After each of main themes a written tests to be done, on which tasks to be solved and the questions of theory to be answered. Each task and the question are valued at a certain score, which is calculated at mid-semester grades. Study course final mark consists of two parts: a mid-semester mark - 30% and exam mark - 70%.

Study course outline

Week	Topic and subtopic	**Type** (lecture, seminar, laboratory work)
1	Basic concepts of set theory.	Lecture
2	Basic concepts of set theory.	Seminar
3	1. Propositional logic. Proposition. Logical operations. Propositional formulas. Truth tables. Tautologies. Logical Equivalence.	Lecture
4	1. Propositional logic. Proposition. Logical operations. Propositional formulas. Truth tables. Tautologies. Logical Equivalence.	Seminar

5	1. Propositional logic. Normal forms. Principle of duality. Boole functions. Boole functions implementation for discrete automata analysis and synthesis. Logical consequences.	Lecture
6	1. Propositional logic. Normal forms. Principle of duality. Boole functions. Boole functions implementation for discrete automata analysis and synthesis. Logical consequences.	Seminar
7	2. Predicate logic. The predicate. Logical operations with predicates. The universal quantifier and the existential quantifier. The predicate logic formulas. Free and bounded variables.	Lecture
8	Test.	Seminar
9	2. Predicate logic. The principle of concretisation. Identically true formulas. Normal forms.	Lecture
10	2. Predicate logic. The predicate. Logical operations with predicates. The universal quantifier and the existential quantifier. The predicate logic formulas. Free and bounded variables.	Seminar
11	3. Propositional Calculus. The axiomatic approach to propositional logic. Logical axioms and inference rules. Proofs and Theorems. Inference from hypotheses. Deduction theorem. The Completeness Theorem. Solvability theory. Axiom independence.	Lecture
12	2. Predicate logic. The principle of concretisation. Identically true formulas. Normal forms.	Seminar
13	4. First-Order Language. Terms and Formulas in First-Order Languages. Language interpretations (models). Formulas interpretations. Examples of languages and interpretations. Laws of logic. Prenex normal form. Conjunctive and disjunctive normal forms.	Lecture
14	Test.	Seminar
15	5. Formal axiomatic theories. Predicate calculus. Logical and special axioms. Inferences from axioms. Formal axiomatic theories. Theories and Models. Examples of formal axiomatic theories. Completeness theory. Interpretability.	Lecture

	Categoricality of theories. Languages. Special axioms. Goedel’s incompleteness Theorem.	
16	5. Formal axiomatic theories. Predicate calculus. Axioms. Inferences from axioms.	Seminar

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Labor Safety and Ergonomics

(Darba aizsardzība un ergonomika)

Author	Lecturer, Master of lab. prot. Varis Vītols
LAIS code	SDSK2001
Type of evaluation	Test
Credit points (ECTS)	2 credit points (3 ECTS)
Prerequisites	Mathematics on the secondary school level
Course group	

Study course objective

The objective of this course is to provide knowledge of any possible work environment risks, work environment conditions harmful for health and special conditions which may affect a worker's safety and health during performance of work and possible impacts on people as a result of their influence. To maintain systematic perception to help evaluate risks in human life and health (social) aspect.

Study results

As a result of the course, the student acquires the skills in working with normative acts, can practically apply the labour safety activity plan development technology, calculation of evacuation exit number and time, applying risk evaluation methods, and also can define work environment conditions harmful for health and necessary protection activities to prevent their influence.

Organization mode of students' individual work

- Studying the typical documentation regarding planning, health check, training, and risk determination.
- Studying the risk evaluation methods.
- Studying the normative acts.
- Studying the theoretical literature.
- Preparing for the final test.

Evaluation of study results

Lecture attendance shall be at least 75% of total attendance; successfully passed final test at the end of the course.

Study course outline

Week	Topic and subtopic	**Type** (lecture, seminar, laboratory work)
1	National labor protection policy. Involved parties. Social dialogue. Types of responsibility	Lecture, practice
2	The risk factors of work environment, special conditions. Negative impacts of work environment	Lecture, practice
3	Training in labor protection issues	Lecture, practice
4	Planning activities. Internal supervision of work environment	Lecture, practice

5	Health checks due to risks in work environment	Lecture, practice
6	Work equipment, the basics of work place setup, work with workstation display. Safety signs on work places. Individual protection equipment, collective protection measures	Lecture, practice
7	Work environment risk factor evaluation. Work environment risk evaluation methods	Lecture, practice
8	First aid in case of work accident. Investigation and recording of work accidents	Lecture, practice

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Object Orientated Modelling

(Objektorientētā modelēšana)

Author	Dr. sc. ing., assistant prof. Raita Rollande
LAIS code	DziT3007
Type of evaluation	Exam, project
Credit points (ECTS)	2 credit points (3 ECTS)
Prerequisites	Object Oriented Programming
Course group	

Study course objective

The main aims of the course are to introduce students to the basic principles of object oriented modelling and to provide knowledge of the Unified Modeling Language.

Study results

- Understand the basic concepts of object-oriented modeling.
- Be able to explain the importance of modeling and how the Unified Modeling Language supports the object-oriented system analysis.
- Understand and use the Unified Modeling Language notation.
- Be able to perform the analysis of problems by applying object-oriented modeling.
- Ability to work in a team, solving problems and offering solutions.
- Show the importance of the system analysis and design in solving complex problems.
- Show the difference between object-oriented approach and traditional approaches of system analysis and design.
- Know all UML diagrams and the importance of using object-oriented modeling.
- To know the role and functions of each UML diagrams the in system development by using object-oriented modeling.
- Use the appropriate notation in developing various UML models (Class diagram, Use case diagram, Activity diagram, Sequence diagram, Interaction overview diagram, Timing diagram).
- Be able to read UML diagrams.
- Understand the model driven architecture.
- Develop ability to work with a variety of unified modelling language tools.

Organization mode of students' individual work

- Description of the problem. Write a description of the problem for system analysis.
- Project. A student analyzes developed problem description using object-oriented approach of another student. At the end of the semester work is presented to the teacher.
- Introduction to UML tools. Students get acquainted with UML tools, two of which are selected to carry out modeling.
- In practical classes students make various UML diagrams.
- Preparation for the exam.

Evaluation of study results

Project (30%), Exam (70%)

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, laboratory work)
1	Introduction to object-oriented modeling. Information Systems (IS) design using the object-oriented approach. Basic concepts of object-oriented modeling. Brief history of the object-oriented modeling.	Lecture
2	Information Systems (IS) design using the object-oriented approach. Analysis of the problem description, noun selection and analysis, data dictionary creation for the teacher defined problem description. Selecting the project theme.	Practical lesson
3	Unified Modeling Language (UML). UML application for IS development. UML diagrams. Class diagram.	Lecture
4	Class diagram design using teacher defined problem description.	Practical lesson
5	System dynamic model. Behavioural diagrams: Statechart diagram, Activity diagram, Use - Case diagram.	Lecture
6	Use - Case diagram design using teacher defined problem description.	Practical lesson
7	Tools for UML. Code generation options.	Lecture
8	Activity diagram design using teacher defined problem description.	Practical lesson
9	Interaction diagrams: Sequence diagram and Collaboration diagram.	Lecture
10	Sequence diagram design using teacher defined problem description.	Practical lesson
11	Interaction diagrams: Interaction overview diagram, UML Timing Diagram. Structure diagrams: Component diagram and Deployment diagram.	Lecture
12	Code generation from class and sequence diagrams. Reverse engineering.	Practical lesson
13	Structure diagrams: Object diagram, Package diagram, Composite structure diagram, Profile diagram.	Lecture
14	UML Timing Diagram and Composite structure diagram design using teacher defined problem description.	Practical lesson
15	Insight in Model Driven Architecture (MDA). Objectoriented modeling technology. Summary.	Lecture
16	Summary of practical lessons results and analysis. Individual project submission. Preparation for the exam.	Practical lesson

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Object Oriented Programming

(Objektorientētā programmēšana)

Author Mag. paed., lekt. Estere Vītola
LAIS code DziT2006
Type of evaluation Test
Credit points (ECTS) 4 credit points (6 ECTS)
Prerequisites Basics of programming language C or C++
Course group

Study course objective
To develop an understanding of object-oriented approach to programming. Understand and be able to apply object-oriented programming approach to software development process by using the programming language C++. To be able to use this approach in other object-oriented programming languages.

Study results

- Able to explain the basic concepts of object-oriented programming approach and realize them in programming language C ++.
- Able to explain the object-oriented programming and procedural programming features and compare these approaches.
- Able to define the class as a real object description, choose the descriptive variables (data members) and define the member functions.
- Able to develop programs using the language C++ and object-oriented approach.
- Able to analyze and explain the C++ source code.
- Able to use a C ++ library classes, including the STL (Standard Template Library).
- Able to work with literature and internet resources.

Organization mode of students' individual work
Regular studies of course material, literature and online resources; homework assignments; consultations with lecturer.

Evaluation of study results
A systematic and work during the semester – 50%

- Systematic work in lectures and seminars – 5%
- Homework assignments – 25%
- Tests - 20%

Exam - 50%

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, laboratory work)

1	Introduction. Software life cycle. Object-oriented programming approach, comparison with procedural programming approach. Review of the most popular programming language.	Lecture, seminar
2	Basic concepts of Object-oriented programming (OOP). Class as an abstract data type. Object as a class instance. Class implementation in the programming language C++. Access levels. Encapsulation and hiding.	Lecture, seminar
3	Constructors. The default constructor, overloaded constructors.	Lecture, seminar
4	Static class members. Pointer this. Constant class functions and constant function arguments. Passing arguments (objects) by value and by reference.	Lecture, seminar
5	Member and "non-member" functions, comparison. Class friends.	Lecture, seminar
6	Operator overloading. Overloaded operators as member functions and as "non-member" functions.	Lecture, seminar
7	**Test**. A simple class development using previously learned OOP concepts and techniques. Development of class client program.	Lecture, seminar
8	Dynamic memory usage in the class. The copy constructor definition and assignment operator definition. Shallow and deep copying.	Lecture, seminar
9	Templates. Function template definition. Class template definition. STL (Standard Template Library) functions and classes.	Lecture, seminar
10-11	Various associations between classes, such as a-kind-of, part-of, has-a. Using UML use to represent association between classes. The composition and aggregation. Inheritance. The base class and inherited class. Private, public and protected class members and public, protected and private inheritance.	Lecture, seminar
12	Virtual functions. Pure virtual functions and abstract classes.	Lecture, seminar
13	Exceptions and exception handling. Exception handling implementation in language C++. C ++ exception class.	Lecture, seminar
14	**Test**. Development of classes using previously learned OOP concepts and techniques. Development of client program.	Lecture, seminar
15	Data structures: stacks, queues, linked lists. Data structure development using object-oriented programming approach.	Lecture, seminar
16	Summary and repetition. Miscellaneous.	Lecture, seminar

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Optimization Methods

(Optimizācijas metodes)

Author	Jānis Vucāns
LAIS code	
Type of evaluation	Test
Credit points (ECTS)	2 credit points (3 ECTS)
Prerequisites	Algebra and Calculus on the secondary school level, skill in at least one programming language
Course group	

Study course objective

To provide students with knowledge on the theoretical background of optimization methods and to build their skills to apply the optimization methods and their most used numerical algorithms in solving various types of problems.

Study results

Understanding about the set of optimization methods, about main results of mathematics forming the basis for building optimization methods, about main fields of application of optimization methods and about their more frequently used numerical algorithms. Gained skills to apply optimization methods and their more frequently used numerical algorithms in solving of concrete types of problems.

Organization mode of students' individual work

Regular studies of course material, literature and online resources; training the ability to apply the special type computer software; elaboration of laboratory works with individually assigned problems (with the possibility in case of necessity to have consultations with the lecturer) and defending the solutions of problems.

Evaluation of study results

Individual laboratory work's assignments - 100%.

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, laboratory work)
1	Topic 1 – Classification of optimization methods. Active and passive search. Stochastic and deterministic minimization algorithms. Application of basic results from the calculus of functions of one and several variables for determination of extremal values of the functions; the concepts of inf, sup, arg min and arg max; local and absolute extrema; determination of absolute extrema in the situations with or without additional conditions in the form of equalities or inequalities.	Lecture

2	Laboratory work on the Topic 1 and its defense.	Laboratory work
3	Topic 2 – Mathematically theoretical basis for minimization of one variable unimodal functions; more often used numerical algorithms – Dichotomy method, Golden section method and Fibonacci method.	Lecture
4	Laboratory work on the Topic 2; defense of the Laboratory work on the Topic 1.	Laboratory work
5	Topic 3– Concept of Lipschitz continuous function; numerical algorithms for minimization of such one variable functions, including the Broken lines method. Tangent method.	Lecture
6	Laboratory work on the Topic 3; defense of the Laboratory work on the Topic 2.	Laboratory work
7	Topic 4 – The types of Linear Programming problems, more often used in applications – Problem of diet, Production problem, Transportation problem. Transportation type problems and possibilities of their reduction to the Transportation problem. More often used numerical algorithms for solving the Linear Programming problems.	Lecture
8	Laboratory work on the Topic 4; defense of the Laboratory work on the Topic 3.	Laboratory work
9	Topic 5 – Mathematic basis of Game Theory. Reducing of the Two-person game with the zero sum to the solving of Linear Programming problem.	Lecture
10	Laboratory work on the Topic 5; defense of the Laboratory work on the Topic 4.	Laboratory work
11	Topic 6 – Determination of absolute extrema for several variables function, including Exclusion method, Lagrange multipliers method, Method of graphical solution.	Lecture
12	Laboratory work on the Topic 6; defense of the Laboratory work on the Topic 5.	Laboratory work
13	Topic 7 – Basic algorithms for minimization of several variable functions – Gradient methods, Newton methods et al.	Lecture
14	Laboratory work on the Topic 7; defense of the Laboratory work on the Topic 6.	Laboratory work
15	Topic 8 – Use of the Bellman Dynamic Programming principle for solution of Optimal Control Problems.	Lecture
16	Laboratory work on the Topic 8; defense of the Laboratory works on the Topics 7 and 8.	Laboratory work

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Operating Systems

(Operētājsistēmas)

Author	Prof. Dc.Sc.Ing. I. Lemberskis / Lect. Mag. Oec. G. Neimanis
LAIS code	1228
Type of evaluation	Exam
Credit points (ECTS)	4 credit points (6 ECTS)
Prerequisites	Basic knowledge in computers, C programming language
Course group	

Study course objective

Provide knowledge in operating systems theory, structure, design and working principles. Knowledge in operating systems installation, configuration and maintenance as well as programming in LINUX environment.

Study results

Knowledge in theory of operating systems, installation, configuration and maintenance as well as programming in LINUX environment.

Organization mode of students' individual work

Regular studies of course material, literature and online resources; practical exercises assignments; consultations with lecturer.

Evaluation of study results

Exam – 70%; Practical exercises - 30%.

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, laboratory work)
1	Evolution and classification of operating systems LINUX structure and basic commands. File system	Lecture, practice
2	Computer structure, Instruction execution diagram System calls fork(),wait(),exit()	Lecture, practice
3	Proceses queue and treatment; System call dup()	Lecture, practice
4	Memory partition. System call execl()	Lecture, practice
5	Cashe memory. System call ppid(),getpid()	Lecture, practice
6	Proceses deadlock and starvation. Input-output system calls	Lecture, practice
7	Banker's algoritm. System call pipe()	Lecture, practice
8	Disk structure. System call signal().	Lecture, practice
9	Mutual exclusion (ME)(software approach). Unix and Linux history.	Lecture, practice
10	4 variants how to implement ME. Installing Linux OS.	Lecture, practice

11	Dekker and Peterson's algoritms. Linux OS help system, system utilities.	Lecture, practice
12	Mutual exclusion (hardware approach). Linux package management systems. Installing software from source code.	Lecture, practice
13	Proceses shceduling. Linux command line interface. Shell scripting.	Lecture, practice
14	Semaphores. Linux desktop management systems, configuring printing and SSH.	Lecture, practice
15	Produsers and consumers problem with infinite and circular buffers Installing FreeBSD.	Lecture, practice
16	Produsers and consumers problem description using semaphores. FreeBSD package management systems.	Lecture, practice

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Programming

(Programmēšana)

Author	Mag. paed., lecturer Estere Vītola
LAIS code	DziT1009
Type of evaluation	Exam
Credit points (ECTS)	4 credit points (6 ECTS)
Prerequisites	N/A
Course group	

Study course objective

To acquire basic knowledge of algorithms and program development process. Learn algorithmic thinking. Understand and be able to apply procedural programming approach to program development process by using the programming language C++.

Study results

- Able to develop applications (programs) using the programming language C ++ in accordance with good programming practice.
- Able to detect and correct errors in the source code.
- According to requirements of the problem are able to find an appropriate solution and to justify it.
- Able to use C ++ library functions.
- Able to analyze and explain the C ++ source code.
- Able to work independently with literature and internet resources.

Organization mode of students' individual work

Regular studies of course material, literature and online resources; homework assignments; consultations with lecturer.

Evaluation of study results

A systematic and work during the semester – 50%

- Systematic work in lectures and seminars – 5%
- Homework assignments – 25%
- Tests - 20%

Exam - 50%

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, laboratory work)
1	Introduction. Algorithm. Program. History of programming languages. Programming paradigms. Review the most popular programming language.	Lecture, seminar

2	The program life cycle. Compilation and execution. C ++ program structure. Error detecting and correcting. Comments. Programming style. Internet resources.	Lecture, seminar
3	Variables and data types. Constants. Operators. Operator priorities. Input / output using the predefined cin and cout objects.	Lecture, seminar
4	Conditional and logical operators. Controlling program flow by using the if ... else and switch statements.	Lecture, seminar
5	Loops (for, while, do … while).	Lecture, seminar
6	Functions. C ++ library functions. Function declaration and definition (implementation). Function arguments and parameters. Function returning value type. Variable scope. Reference (reference) type variables. Constant function parameters and constant functions. Function overloading. Recursive functions.	Lecture, seminar
7	**Test**. Development of simple programs using the acquired topics.	Lecture, seminar
8	Arrays. Two-dimensional arrays. Arrays as function parameters.	Lecture, seminar
9	Characters and strings (C-style strings). String size, initializing. C ++ style strings - string class. Input/output. C++ library functions that manipulates character strings.	Lecture, seminar
10-11	References. Addresses and pointers. Operators * and &. Pointers and arrays. Pointers arithmetic. Pointers to pointers. Pointers to functions.	Lecture, seminar
12	Memory management in C ++. Variable duration and scope. Dynamic or free memory. Operators new and delete.	Lecture, seminar
13	C++ input/output file streams.	Lecture, seminar
14	Compound C++ types: enumerations and structures.	Lecture, seminar
15	**Test**. Development of programs using the acquired topics.	Lecture, seminar
16	Summary and repetition. Miscellaneous.	Lecture, seminar

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Numerical Methods

(Skaitliskās metodes)

Author Mg. sc. comp. Dace Briede
LAIS code Mate3001
Type of evaluation Exam
Credit points (ECTS) 2 credit points (3 ECTS)
Prerequisites Higher Mathematics
Course group

Study course objective
To acquaint students with methods for solving scientific problems on a modern computer and limitations of these methods.

Study results
Upon successful completion of the course, the student will be able to use a computer to solve problems that have been cast into certain standard mathematical forms and understand the underlying algorithmic techniques. The student will have an understanding of the limitations of numerical methods.

Organization mode of students' individual work
Systematic work during semester includes:
- regular learning using lecture materials, literature, internet resources,
- completion of home assignments,
- preparation for the exam, weekly teacher consultations.

Evaluation of study results
Course assessment consists of two parts:
- average grade for the home assignments (30% of total grade)
- exam grade (70% of total grade)

If the average grade for home assignments is 8 or higher, the student can choose not to write the exam. In this case the average grade for home assignments is also the total grade for the course.

Study course outline

Week	Topic and subtopic	**Type** (lecture, seminar, laboratory work)
1-2	Numerical methods and error analysis. A simple mathematical model. Significant digits of precision. Errors: absolute and relative. Accuracy and precision. Rounding and chopping. Taylor series. Floating-point representation.	Lecture, seminar

3-4	Locating roots of equations. Bisection method. False position method. Newton's method. Secant method. Simple fixed-point iteration. Convergence analysis.	Lecture, seminar
5-6	Systems of linear equations. Gauss elimination. Determinants and Cramer's rule. Gauss-Seidel method. Jakobi iterative method.	Lecture, seminar
7-8	Interpolation. Vandermonde matrix. Polynomial interpolation. Lagrange interpolating polynomials. Finite difference and divided difference. Newton's interpolating polynomials. Interpolation errors. Spline interpolation. Method of least squares. Nonlinear example. Numerical differentiation. Derivative formulas via interpolation polynomials. Derivatives of unequally spaced data. Errors in numerical differentiation.	Lecture, seminar
9-11	Numerical integration. Newton-Cotes integration formulas Riemann sums. Trapezoidal rule. Simpson's rules. Integration with unequal segments.	Lecture, seminar
12-14	Ordinary differential equations. A solution of an ordinary differential equation. Geometric interpretation of differentiation, vector field. First order Taylor series method (Euler's method). Higher-order Taylor series methods. Heun's method. Midpoint method. Backward Euler's method. Runge-Kutta method.	Lecture, seminar
15-16	Ordinary differential equations. Picards iterations. Systems of ordinary differential equations. Predator-prey model. Euler's method. Runge-Kutta methods. Autonomous ODE systems. Higher-order equations and systems.	Lecture, seminar

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WWW Technologies

(Tīmekļa tehnoloģijas)

Author Mārcis Koloda
LAIS code DziT3011
Type of evaluation Exam
Credit points (ECTS) 2 credit points (3 ECTS)
Prerequisites N/A
Course group

Study course objective
Aim of the course to provide practical skills in dynamic web site development and provide insight into the development tools, languages and environments.

Study results
Training course the students will gain practical skills in website development using the following technologies:

- HTML, CSS, Javascript, JQuery, Angular.
- PHP, MySQL, Node.js, PHPMyAdmin, GIT.

Organization mode of students' individual work
Practical lessons, home assignments and course work development.

Evaluation of study results
Home assignments, course work and exam. 25% home assignments, 50% course work and 25% exam.

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, laboratory work)
1	Tools for website development. Atom Visual Studio Code, PHPMyAdmin, Cyberduck e.a	Seminar
2	Preparing environment for work: Domains, hosting, etc.	Seminar
3	HTML usage and syntax.	Seminar
4	CSS usage and syntax.	Seminar
5-6	Javascript, JQuery	Seminar
7	Angular basics	Seminar
8-9	Server-side languages: PHP, Node.js	Seminar
10-11	Datubases: MySQL	Seminar
12	Content Management Systems: Wordpress, Joomla, Drupal	Seminar
13-15	Coursework development	Seminar

16	Coursework presentation	Seminar

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Business Basics

(Uzņēmējdarbības pamati)

Author Professor Sergejs Hiļķevičs
LAIS code VadZ3001
Type of evaluation Exam
Credit points (ECTS) 2 credit points (3 ECTS)
Prerequisites N/A
Course group

Study course objective
The main objective of the course is to provide ITF students with knowledge in business administration and business processes that is necessary for successful work in business structures.

Study results
After completion of the course, students will have fundamental knowledge necessary in business administration. Students will be able to understand business administration terminology and principles, know how the business organization is functioning, analyse business processes and functions, and will have skills to identify business opportunities.

Organization mode of students' individual work
Regular studies of course material, literature and online resources; practical exercises; homework assignments and development of course project in the form of business plan; consultations with lecturer.

Evaluation of study results
Homework assignments - 50%; Course project - 50%.

Study course outline

Week	Topic and subtopic	Type (lecture, seminar)
1	1. Economic activities as human's existence condition. 2. Business and business administration. 3. The essence and functions of businesss. 4. The goals and tasks of business. 5. Capital, labour, resources, goods, services markets.	Lecture, seminar
2	6. Business organizational forms. 7. Business legal foundations. 8. The process of company creation and development. 9. The reorganization of company. 10. Business globalization.	Seminar
3	11. Functional approach to business administration. 12. Organization theory. 13. Company organizational structure 14. Management as business function. 15. Financial management as business function.	Lecture, seminar

4	16. Human resources management as business function. 17. Material resources management as business function. 18. Main business activity of company as business function. 19. Marketing as business function. 20. Hierarchical business organizational structures.	Seminar
5	21. Management of hierarchical structures. 22. Different levels of management in organizations. 23. Management efficiency. 24. Management specific features in different economy sectors. 25. Management historical development.	Lecture, seminar
6	26. Classical managerial theories. 27. Human behaviour theories. 28. Quantitative management theories. 29. Integrated management theories. 30. Modern management theories.	Seminar
7	31. Business environment. 32. Internal environment. 33. External environment. 34. Internal and external environment relations. 35. Communications in management.	Lecture, seminar
8	36. Human behaviour in communication process. 37. Communication forms classification. 38. Communications management. 39. Decision making general description. 40. Decision making process.	Seminar
9	41. Individual and collective decision making. 42. Quantitative methods in decisions making. 43. Decision making efficiency evaluation. 44. Business planning general description. 45. Organization goals formulation.	Lecture, seminar
10	46. Strategic, tactic, operative plans. 47. Classification of plan types and planning methods. 48. Budget as planning tool. 49. Strategic planning goals. 50. Strategic planning process.	Seminar
11	51. Strategic planning levels. 52. Functional level strategic planning. 53. Business level strategic planning. 54. Company level strategic planning. 55. Coordination as business function.	Lecture, seminar
12	56. Planned works and responsibility distribution. 57. Administrative capacity evaluation. 58. Powers distribution 59. Centralization and decentralization of companies. 60. General principles of organizational structures creation.	Seminar
13	61. Organization structure influencing factors. 62. Organization structure and company life cycle. 63. Organization structure correspondence to goals of company. 64. Organization structure and company products. 65. Organization structure and territorial factors.	Lecture, seminar
14	66. Organization structure and customers. 67. Organization structure and HRM. 68. PERT charts. 69. Imitation modelling in business. 70. Motivation theories evolution.	Seminar

15	71. Control in organizations. 72. Main forms and principles of control. 73. Operative control. 74. Tactic control. 75. Strategic control.	Lecture, seminar
16	76. Control efficiency evaluation. 77. Internal and external control. 78. Administrative power. 79. Authority influencing factors. 80. CEO personality significance in business. 81. Business administration problems classification. 82. CEO behaviour models. 83. CEO behaviour style in different situations.	Lecture, seminar

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Probability Theory and Mathematical Statistics

(Varbūtību teorija un matemātiskā statistika)

Author	Lector, Master of Science in Mathematics Jeļena Mihailova
LAIS code	Mate2001
Type of evaluation	Exam
Credit points (ECTS)	2 credit points (3 ECTS)
Prerequisites	Mathematics on secondary school level, Mathematical Analysis I
Course group	

Study course objective
The course objective is to acquire the main concepts, methods and results of the probability theory and mathematical statistic and to learn to use them in solving practical tasks.

Study results

- Student will be able to calculate a classical, statistical and geometric probability, the conditional probability. Able to calculate the total probability and be able to apply the Bayes' formula. Able to apply the Bernoulli formula to calculate the probability of independent events.
- Able to understand the difference between discrete and continuous random variables and able to calculate the numerical characteristics (mathematical expectation, variance, moments, etc.). Able to operate with distribution and density functions. Know the most important probability distributions of random variables. Able to understand the law of large numbers, the Chebyshev inequality, the Central Limit Theorem. Able to understand the basic concept of multi-dimensional random variable.
- Able to understand the basics of sampling and processing of statistical data, the statistical distribution of parameter estimates, the point and interval evaluation of the confidence interval for statistical hypothesis testing and can perform a standard calculation of statistics. Able to understand the basic concepts correlation and regression analysis. Able to write the linear regression equation, calculate the correlation coefficient.

Organization mode of students' individual work
Regular course of study substances learning through lecture materials, textbooks, internet resources. Regular homework performance. Weekly teacher consultations. Students work in groups. Preparing for the exam.

Evaluation of study results
After each of the main themes, a written tests to be done, on which tasks to be solved and the questions of theory to be answered. Each task and the question are valued at a certain score, which is calculated at mid-semester grades. Study course final mark consists of two parts: a mid-semester mark - 30% and exam mark - 70%.

Study course outline

Week	Topic and subtopic	**Type** (lecture, seminar, laboratory work)
1	Introduction in Probability theory. Basic concepts of probability theory. The random events and algebra of events. Definition of probability (classical, statistic, geometric). Addition and multiplication laws of probabilities.	Lecture
2	Basic concepts of the probability theory. Combinatorial problems. Definition of probability (classical, statistic, geometric).	Seminar
3	Addition and multiplication laws of probabilities. Conditional probability. Total probability and Bayes formula. Trials and Binomial probabilities.	Lecture
4	Addition and multiplication laws of probabilities. Conditional probability. Total probability and Bayes formula. Bernoulli trial.	Seminar
5	Random variable (definition and classification). Functions of a random variable (distribution and density functions). Discrete random variables. Expected value (mathematical expectation), variance and standard deviation of a discrete random variable. Properties.	Lecture
6	**Test** “Events and Probability”.	Seminar
7	The most important probability distributions of discreet random variables: uniform, hypergeometric, binomial, geometric, the Poisson distributions. Continuous random variable. Probability density function and distribution function. Expected value and variance.	Lecture
8	Discrete random variable. Functions of a discrete random variable (distribution and density functions). Probability, expected value, variance calculation. Graphs of p.d.f f and of c.d.f F .	Seminar
9	Characteristics of probability distribution. Chebyshev’s inequality. The most important probability distributions of continuous random variables (exponential, uniform, normal, t-distribution).	Lecture
10	Continuous random variable. Probability density function and distribution function. Probability, expected value, variance calculation.	Seminar
11	Strong law of large numbers. Central limit theorem and De Moivre-Laplace theorem. Basic concepts of random variable probability distribution of discrete complete 2D.	Lecture
12	**Test** “Random variable”.	Seminar

13	Introduction to Statistic. Descriptive statistics (collecting and presentation of statistical data; cumulative sample distribution function). Inductive statistics (random sampling and sampling distributions; point and interval estimation; confidence interval).	Lecture
14	Most important calculations in statistics.	Seminar
15	Basic concepts of correlation theory. Correlation coefficient. Linear regression equation.	Lecture
16	Point and interval estimation. Confidence interval. Correlation coefficient. Linear regression equation.	Seminar

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Visual Programming Languages

(Vizuālās programmēšanas valodas)

Author Dr. Vairis Caune
LAIS code DziT3008
Type of evaluation Exam, practical exercises
Credit points (ECTS) 4 credit points (6 ECTS)
Prerequisites Object Oriented Programming, JAVA Programming
Course group

Study course objective
Objective of this course is to introduce students to MS VisualStudio IDE, .NET platform, C# programming language and different modern technologies connected to them as well as to give students basic understanding about the advantages and shortcomings of these technologies and their main cases of usage.

Study results
After finishing this course students must have basic knowledge about MS VisualStudio IDE, .NET platform and C# programming language. Students must understand the possibilities and advantages of using these technologies and they must be able to develop some basic applications using MS VisualStudio about the topics covered throughout the course. Students must be able to choose the appropriate solution among the ones discussed in this course and compare them to the technologies, learned elsewhere.

Organization mode of students' individual work
Students must attend lectures or read the according information from the provided presentations or other sources (including internet). Students must do the given assignments and finish them at home if they do not complete them during the seminars. Weekly consulting session with the lecturer is available.

Evaluation of study results
Final evaluation includes: Exam/semester project (40%); Practical assignments (20%); Practical tests (20%); Seminar assignments (10%); Theoretical tests during the semester (10%).

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, laboratory work)
1	C# language syntax. Creation of C# project in VisualStudio	Lecture, seminar
2	Heritance in C#. Graphical interfaces.	Lecture, seminar
3	Creating Complete C# application	2 seminars
4	Working with graphics. Canvas, 2D and 3D objects. OpenGL	Lecture, seminar

5	OpenGL application development.	2 seminars
6	XNA framework in simple game implementation.	Lecture, seminar
7	Application testing	Lecture, seminar
8	.NET framework security	Lecture, seminar
9	Usage of databases	Lecture, seminar
10	Implementation of solution using databases.	2 seminars
11	Threading and parallel computing	Lecture, seminar
12	Implementation of parallel computing application	2 seminars
13	Web applications using ASP.NET	2 seminars
14-16	Course project implementation and presentation	6 seminars

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Analog Devices

(Analogās ierīces)

Author	Dr. sc. ing., assist. prof. Aigars Krauze
LAIS code	ETel2005
Type of evaluation	Exam
Credit points (ECTS)	4 credit points (6 ECTS)
Prerequisites	Physics – Electricity and Magnetism, Semiconductor Devices
Course group	

Study course objective
Extend knowledge of the theory and applications of analog (discrete and integral) circuits.

Study results
- Knowledge and understanding of schema techniques of discrete and integral analog circuits. Knowledge of designing, calculation and analysis of analog circuits.
- Practical skills on choice of element base, assemble the scheme, measurement of parameters, interpret results.

Organization mode of students' individual work
Lecture notes, lecture course notes (available in the university Moodle site) independent development, additional information acquisition in the library and on the Internet. Lab report preparation and presentation. Self-dependent preparing for tests on a specific topic. Advice to the course instructor outside of class time.

Evaluation of study results
All lab. assignments have to be carried out and assessed; Three tests shall be successfully (grade ≥4) done – 40%; Exam - 60%

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, laboratory work)
1	Linear amplifier, parameters, characteristics DC biasing of the transistor (repetition)	Lecture 2 h, seminar 2 h
2-3	BJT resistor stage amplifier, DC & AC calculation	Lecture 4 h, seminar 4 h
4	Common emitter stage amplifier	Laboratory work 4 h
5	FET amplifiers Common collector resistor stage amplifier	Lecture 2 h, seminar 2 h
6-7	Amplifier frequency response	Lecture 4 h, seminar 4 h

8	Power amplifier output stage	Lecture 2 h, seminar 2 h
9	Feedback theory, stability of amplifier	Lecture 4 h
10	Analog integral circuit design techniques – current source, current mirror, differential stage	Lecture 2 h, seminar 2 h
11	Differential amplifier	Laboratory work 4 h
12	Operational amplifier, parameters	Lecture 4 h
13	Negative feedback in Op Amp's	Lecture 2 h, seminar 2 h
14-15	Op Amp's typical applications	Lecture 4 h, seminar 4 h
16	Course summary, lab work assessment	Seminar 4 h

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English for Engineers I + II

(Angļu valoda I + II)

Author	Assistant professor, Msc. Jānis Līmežs
LAIS code	Valo3763
Type of evaluation	English I – test; English II – exam
Credit points (ECTS)	English I – 2 credit points (3 ECTS); English II – 2 credit points (3 ECTS)
Prerequisites	English on secondary school level
Course group	

Study course objective
The aim of the course is to give knowledge about the electronic technologies, the structure and development, as well as the applications. Consolidate the practical language skills of the precise use of terminology, improve the grammatical knowledge, and develop the skills of correct choice and use of grammatical forms and functions.

Study results
The course is intended to give the concept of electronics technologies, knowledge presentation, and different approaches to modifying knowledge, creating data basis, and formatting and applying it. The course is based on vocabulary enrichment and improvement of language skills. In the course there are used such forms of communicative learning as team-work, project elaboration and their presentation, performing in front of the audience, discussions, debates. The handout materials are designed so that they improve the students' individual work. The forms of independent work are the use of special dictionaries, periodicals, Internet, and other information sources available in the VeUC library.

Organization mode of students' individual work
Lecture notes, lecture course notes (available in the university Moodle site) independent development, additional information acquisition in the library and on the Internet. Lab report preparation and presentation. Self-dependent preparing for tests on a specific topic. Advice to the course instructor outside of class time.

Evaluation of study results
The attendance constitutes at least 75% of the total amount of classes, successfully passed all midterm tests, the final test at the end of Term 1, and final exam at the end of Term 2.

Study course outline English I

Week	**Topic and subtopic**	**Type** (lecture, seminar, practical work)
1	Introduction into Electronics	Lecture, practical work

2-8	Electronic components: Component values, Batteries, Remote control, Alarm systems, Transistor characteristics, Metal detector. **Midterm Test**	Lecture, practical work
9-13	Music gadgets: Music centre, Drum machine, Audio recording systems, CDs. **Midterm Test**	Lecture, practical work
14	Test and repair instruments	Lecture, practical work
15-16	Graphs **Midterm Test**	Lecture, practical work

Study course outline English II

Week	**Topic and subtopic**	**Type** (lecture, seminar, practical work)
1-6	Different equipment: High definiton television, Video cassette recorder, Computers, Digital watch, Cellphones. **Midterm Test**	Lecture, practical work
7-9	Data transmission. **Midterm Test**	
10-15	Careers in electronics: Sound engineer, Technician, Field engineer, Future career, Job ads. **Midterm Test**	
16	English for Communication Skills	

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Introduction electrodynamics and antenna theory

(Ievads elektrodinamikā un antenu teorijā)

Author	
LAIS code	ETel3009
Type of evaluation	Test
Credit points (ECTS)	4 credit points (6 ECTS)
Prerequisites	Electromagnetic fields and waves
Course group	

Compulsory reading

1. Giancoli D.C. Physics for Scientists and Engineers with Modern Physics. 4-th edition, Prentice Hall, 2008
2. Balanis, Constantine A. - Antenna Theory, Analysis and Design (4rd Ed) [John Willey 2016]. ISBN-10: 1118642066, ISBN-13: 978-1118642061
3. Joseph Carr and George W. Hippisley. Practical Antenna Handbook McGraw-Hill Education TAB, 5 edition, 2011. ISBN-10: 0071639586, 1.ISBN-13: 978-0071639583

Further Reading List

1. Halliday, Resnick, Walker. "Fundamentals of Physics", 6th edition, John Wiley & Sons Inc., 2001.
2. Platacis. "Elektrība". Zvaigzne, 1974.
3. Sophocles J. Orfanidis. Electromagnetic Waves and Antennas http://www.ece.rutgers.edu/~orfanidi/ewa/
4. The Feynman Lectures on Physics, vol. 6, Ch. 22,23,24 http://www.feynmanlectures.info/

Other sources

1. http://www.antenna-theory.com/ 2. http://eceweb1.rutgers.edu/~orfanidi/ewa/

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Basics of Digital Electronics

(Ciparu shēmtehnikas pamati)

Author	Gatis Gaigals, Māris Ēlerts
LAIS code	ETel1001
Type of evaluation	Exam
Credit points (ECTS)	2 credit points (3 ECTS)
Prerequisites	Mathematics and Physics on the secondary school level
Course group	

Study course objective
Objective of the course is to provide basic knowledge on combination circuits of digital electronics and design principles of logic circuits.

Study results
- Knowledge on basic logic elements and their functions.
- Skills to make identic modifications of the logic functions, using laws of Boolean algebra. Ability to minimize Boolean algebra expressions using modification laws or Carnaugh maps.
- Knowledge about structure of the combination logic and their principles of functioning: decoders, encoders, multiplexors, demultiplexors, code converters.
- Knowledge about the elementary arithmetic circuits – half adder, full adder, multiplier.
- Skills to analyse and synthesize combination logic.
- Knowledge about basic elements of the sequential logic – triggers, (latches, flip-flops) and understanding of their functioning: RS, D, T, JK.
- Skills to work with a specialized software for design and simulation of digital logic circuits.

Organization mode of students' individual work
Independently solving the problems. Synthesis of combination logic using Logisim software. Preparing reports on laboratory works.

Evaluation of study results
Completed, reported and defended eight laboratory works and independent works – 50%; Exam – 50%

Study course outline

Week	Topic and subtopic	**Type** (lecture, seminar, practical lessons, laboratory work)
1	Counting systems. Boolean algebra, basic logic functions.	Lecture
2	Basic logic elements.	Laboratory work

3	Laws of Boolean algebra. Forms of transcription of the logic functions.	Lecture
4	Simplest combination logic circuits. Carnaugh maps.	Laboratory work
5	Minimization of logic functions. Combination circuits, analysis of them. Adders.	Lecture, independent work
6	Analysis of faults of the combination circuits.	Laboratory work
7	Decoders. Cascading of decoders.	Lecture
8	Encoders, priority encoders. Cascading of encoders.	Lecture
9	Multiplexors and demultiplexors, cascading of them.	Lecture
10	Adders. Half-, full adders, parallel adders	Laboratory work
11	Priority encoder.	Laboratory work
12	Decoders, multiplexors, demultiplexors.	Laboratory work
13	Code convertors, arithmetic circuits. Delays and risks in logic circuits.	Lecture
14	State machines Trigers – latches, flip-flops.	Lecture
15	Trigers.	Laboratory work
16	Trigers.	Laboratory work

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Digital Logics and Computer Architecture

(Ciparu elektronika un datoru arhitektūra)

Author Gints Neimanis, Māris Ēlerts
LAIS code ETel1004
Type of evaluation Exam
Credit points (ECTS) 2 credit points (3 ECTS)
Prerequisites Basics of Digital Electronics
Course group

Study course objective

To give the knowledge on combinational and sequential logic circuits. To give basic knowledge about architecture of computers, their main blocks and operational principles.

Study results

To pass the exam, students have to be able to synthesize and analyse the digital logic, sequential logic circuits, using logic elements and triggers. Students have to independently synthesize triggers, registers, counters, adders, decoders, multiplexors and demultiplexors, and to use those elements in the more complex blocks. To have understanding of main blocks of computers and functioning principles of them.

Organization mode of students' individual work

Preparing reports on laboratory works. Study projects – to synthesize logic blocs using Logisim software.

Evaluation of study results

Completed laboratory works and reports defended - 50%. Completed and defended two independent study projects - 50%.

Study course outline

Week	Topic and subtopic	**Type** (lecture, seminar, practical lessons, laboratory work)
1-2	Digital machines. Triggers (latches, flip-flops). Conversion of triggers.	Lecture
3	Triggers.	Laboratory work
4	Synthesis of sequential circuits. Registers.	Lecture
5	Registers.	Laboratory work
6	Architecture of a Fon Neumann computer	Lecture
7	Conters	Laboratory work
8	Representing numbers in a computer.	Lecture
9	Sequential adder	Laboratory work
10	Forms and formats of computer instructions.	Lecture

11	Arithmetic logical unit and Control unit	Lecture, independent work
12	Technologies used in memory microchips. Architecture of different memory forms in a computer.	Lecture
13	Acceleration of performing the computer instructions.	Lecture
14	Periferial devices. Interruptions.	Lecture
15-16	Desiign of a ALU	Independent work

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Digital Signal Processors

(Ciparu signālu procesori)

Author	Juris Prikulis
LAIS code	DziT3003
Type of evaluation	Exam
Credit points (ECTS)	3 credit points (4.5 ECTS)
Prerequisites	Calculus, Linear Algebra, Circuit Theory, Signal Theory and Analysis, Programming

Course group

Study course objective

Provide practical experience in practical applications of digital signal processing for electronic measurements of physical quantities.

Study results

Acquired practical skills in digital systems modeling using Matlab/Octave programming environment and acquisition and processing of experimental data using LabVIEW.

Organization mode of students' individual work

Practical exercises and homework.

Evaluation of study results

40% class exercises and homework 40% practical laboratory 20% exam.

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, tutorial, practical lessons, laboratory work)
1-2	Introduction to Matlab/Octave	Tutorial
3-4	Linear systems, filters, convolution, transforms	Tutorial
5-6	Nonlinear systems	Tutorial
7	Image processing	Laboratory work
8-9	Correlation function and its applications	Tutorial
10-11	Random processes and statistical methods	Tutorial
12-13	Introduction to LabVIEW	Laboratory work
14	Data acquisition and processing in LabVIEW	Laboratory work
15-16	Transforms, filters and analysis using LabVIEW	Laboratory work

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Computer Aided PCB Design

(Datorizētā iespiedplašu projektēšana)

Author	Mārcis Donerblics
LAIS code	ETel2012
Type of evaluation	Exam
Credit points (ECTS)	2 credit points (3 ECTS)
Prerequisites	Basic knowledge on electronic components and circuits, basic computer skills
Course group	

Study course objective

To provide knowledge on computer aided electronic circuit PCB design methods and tools. To crate skillset necessary for computer aided PCB design.

Study results

Understanding of electronic circuit PCB design and manufacturing technologies as well as PCB design tools. Gained skills to apply PCB design tools in electronic circuit design and manufacturing.

Organization mode of students' individual work

Regular studies of course material, literature and online resources; homework assignments and development of course project; consultations with lecturer.

Evaluation of study results

Homework assignments - 50%; Course project - 50%.

Study course outline

Week	Topic and subtopic	**Type** (lecture, seminar, practical lessons, laboratory work)
1	Introduction to KiCAD software.	Lecture, seminar
2	Project settings. Version control. Symbol and junction implementation.	Lecture, seminar
3	Hierarchal structure of project. Buses, jumpers and global signals.	Lecture, seminar
4	Creation of schematic element. New component from existing symbol.	Lecture, seminar
5	Preparation of the circuit to be imported in PCB design tool. Interface of PCB design tool.	Lecture, seminar
6	Project settings for PCB design. Creation of PCB edge layer.	Lecture, seminar
7	Placement and renaming of components.	Lecture, seminar

8	Component creation. New component from existing component.	Lecture, seminar
9	Routing and layer fills.	Lecture, seminar
10	Application and settings of auto-router.	Lecture, seminar
11	Adding of dimensions and text. Importing circuit changes. Exporting PCB changes to circuit schematic.	Lecture, seminar
12	Implementation of report generator. Post-processing of project.	Lecture, seminar
13-16	Interactive work on course project.	Lecture, seminar

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Electricity and Magnetism

(Elektrība un magnētisms)

Author	Artūrs Vrubļevskis
LAIS code	Fizi1001
Type of evaluation	Exam
Credit points (ECTS)	4 credit points (6 ECTS)
Prerequisites	Mechanics, Linear Algebra and Analytic Geometry, Calculus
Course group	

Study course objective
Provide introduction to the electric and magnetic phenomena in vacuum and in media using the concepts of electric and magnetic fields. Develop understanding of direct and alternating current in different media and of the close connection between electric and magnetic phenomena.

Study results
- Understanding of electric and magnetic phenomena at macroscopic and microscopic scales.
- Proficiency in solving problems concerning electromagnetism. Knowledge of the main applications of electromagnetic phenomena.
- Proficiency in planning and executing experiments in electromagnetism, data processing, estimating errors in measurements and results.
- Proficiency in using measuring instruments, sensors, data loggers.
- Proficiency in applying and verifying theoretical relationships in practice.

Organization mode of students' individual work
Regular studies of course material, using study literature and lecture materials. Problems to be solved individually are assigned regularly during the semester. Consultations with the lecturer.

Evaluation of study results
Completed and defended 6 laboratory works (20%); 2 tests taken during the semester (30%); Homework assignments (20%); Exam (30%).

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, practical lessons, laboratory work)
1	Electric charges. Coulomb's law.	Lecture, laboratory work
2	Electric field. Electric dipole.	Lecture, seminar

3	Gauss's law.	Lecture, laboratory work
4	Work, potential energy, and electric potential. Relationship between electric field and potential.	Lecture, seminar
5	Dielectrics in electric field. Capacity, capacitors. Electric field energy.	Lecture, laboratory work
6	Conductors in electric field. Direct current. Ohm's law. Current in different media.	Lecture, seminar
7	Test on topics from week 1.-5.	Test, laboratory work
8	Electromotive force, Ohm's law for a closed circuit, Kirchhoff's rules.	Lecture, seminar
9	RC circuits.	Lecture, laboratory work
10	Magnets and magnetism. Lorentz force. Motion of a charged particle in magnetic field.	Lecture, seminar
11	Magnetic properties of currents. Ampere's law	Lecture, laboratory work
12	Electromagnetic induction.	Lecture, seminar
13	Self-inductance, inductance, mutual inductance, magnetic field energy, transformer.	Lecture, laboratory work
14	Alternating current, phasor diagrams, RLC circuits.	Lecture, seminar
15	Maxwell's equations, displacement current, conservation of electric charge.	Lecture, laboratory work
16	Test on topics from week 6-14. Electromagnetic field energy and momentum, radiation pressure.	Test, lecture

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Electronics Manufacturing Technology. Electronic Circuit Design

(Elektronisko iekārtu ražošanas tehnoloģijas. Elektronisko ierīču iespiedshēmu izstrāde)

Author	Edžus Siliņš
LAIS code	ETel2007
Type of evaluation	Exam
Credit points (ECTS)	2 credit points (3 ECTS)
Prerequisites	Analogue Devices, Basics of Digital Systems
Course group	

Study course objective
The goals is to provide students with basic knowledge and understanding about electronics manufacturing technologies as well as practical skills in preparing information for development of printed circuit boards.

Study results

- Understanding of manufacturing of electronic devices.
- Understanding of technologies for designing, testing and manufacturing of printed circuit boards.
- Understanding of main and exploitation parameters, bodies and packaging of electronic components.
- Understanding of structure and material specifics of printed circuit boards.
- Ability to prepare all the necessary documentation for fabrication of printed circuit boards and manufacturing of products.

Organization mode of students' individual work
-
Evaluation of study results
Successfully passing three tests or an exam - 100%.

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, practical lessons, laboratory work)
	Introduction to development of manufacturing technologies of electronic devices	Lecture
	Preparation of technical documentation for fabrication of printed circuit boards and manufacturing of the developed product	Lecture
	Manufacturing of printed circuit boards	Lecture

	Materials used for printed circuit boards and their properties	Lecture
	Flexible and metal printed circuit boards	Lecture
	Influence of the printed circuit board design on their quality and price	Lecture
	Main and exploitation parameters of electronic components	Lecture
	Types of bodies and packaging of electronic components	Lecture
	A modern electronic device manufacturing company, its equipment	Lecture
	Specifics of manufacturing of electronic printed circuits	Lecture
	Preparation of technical documentation for fabrication of printed circuit boards and manufacturing of the product.	Practical tasks

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Electromagnetic Fields and Waves

(Elektromagnētiskie lauki un viļņi)

Author	Prof., Dr. habil. phys. Juris Roberts Kalniņš
LAIS code	ETel3001
Type of evaluation	Exam
Credit points (ECTS)	2 credit points (3 ECTS)
Prerequisites	Mathematical Analysis, Linear Algebra and Analytic Geometry
Course group	

Study course objective

To give understanding on electromagnetic fields and waves phenomena based on Maxwell's equations. Demonstrate on number of examples how important for applications results can be drawn from the basic equations.

Study results

- Understanding of basic principles and concepts of electromagnetic fields. Understand Maxwell's equations.
- Understanding of general electromagnetic wave propagation and how the plane wave can be used to real situations.
- Ability to solve concrete problems using Maxwell's equations Mathematics skills necessary for modern electrical engineering.

Organization mode of students' individual work

Regular lecture attendance, studies of course material, completed in time home assignments.

Evaluation of study results

Homework assignments - 30%; Exam - 70%.

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, practical lessons, laboratory work)
1	Vector analysis. Scalar and vectorial fields. Vector field derivatives. Gradient. Curl.	Lecture, seminar
2	Second derivatives. Divergence. Vector field flow. Gauss theorem. Circulation.	Lecture, seminar
3	Stoke's theorem. Vector operations. Potential un solenoidal vector fields.	Lecture, seminar
4	Electrostatics. Electromagnetic field characteristics. Vector form of Coulomb's law. Electric charge volume	Lecture, seminar

	density. Current density. Integral and differential form of Gauss' Law. Maxwell' s equation	
5	Charge conservation. Continuity equation. Continuity equation. Laplace's and Poisson's equations. Simple problem examples. Electrostatic field energy.	Lecture, seminar
6	Magnetostatics. Direct-current magnetic field. Magnetic flux and magnetic flux density. Biot-Savart law in differential and integral form. Maxwell's equation.	Lecture, seminar
7	Magnetostatic field energy. Magnetic field of the simplest configurations. Scalar and vector magnetic potentials.	Lecture, seminar
8	Time varying electromagnetic field and Maxwell's equations. Electromagnetic induction law in integral and differential form. Maxwell's equations in vacuum and media. Law of conservation of energy for the electromagnetic field. Poynting vector. Displacement current vector. Maxwell's equations in integral form.	Lecture, seminar
9	Law of conservation of energy for the electromagnetic field. Poynting vector. Displacement current vector. Maxwell's equations in integral form.	Lecture, seminar
10	Electromagnetic waves. Wave equation. Solutions of the Maxwell equations in vacuum. Plane electromagnetic wave. Monochromatic waves. Transverse nature of electromagnetic waves. Wave polarization. Pressure and impulse of electromagnetic wave.	Lecture, seminar
11	Monochromatic waves. Transverse nature of electromagnetic waves. Wave polarization. Pressure and impulse of electromagnetic wave.	Lecture, seminar
12	Light as an electromagnetic wave. Retarded electromagnetic potentials. Oscillating electric dipole radiation. Simple antenna radiation.	Lecture, seminar
13	Electromagnetic waves in lossless media. Electromagnetic field on the boundary of two media. Electromagnetic field tangential and normal components. Boundary conditions. Plane electromagnetic wave incidence on the boundary of two media.	Lecture, seminar
14	Electromagnetic waves between two conductors. TM and TE waves. Rectangular waveguide.	Lecture, seminar
15	Electromagnetic fields and relativity theory. The principle of relativity. Galileo's transformations. Lorentz transformations. Time and space.	Lecture, seminar
16	Electric and magnetic fields in moving coordinate systems. Electromagnetic potentials and alternative form of Maxwell's equations. Invariance of Maxwell's equations.	Lecture, seminar

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Modeling of Chaotic Processes in Electronic Systems

(Haotisku procesu modelēšana elektroniskajās sistēmās)

Author	Asoc. prof., Dr. habil. phys. Juris Žagars
LAIS code	DziT3005
Type of evaluation	Exam
Credit points (ECTS)	2 credit points (3 ECTS)
Prerequisites	N/A
Course group	

Study course objective

The objective of the course is to introduce with the basics of the theory of chaos as well as with its applications for modelling of non-linear electronic circuits. Course is started with introduction of the theory of chaos in connection with the problems of modelling non-linear dynamic systems. The basic ideas are explained mainly by use of the one-dimensional iterative maps under conditions when their behaviour becomes chaotic. The explanation is given for attractors, fractals, bifurcations and other important characteristics of chaos useful for modelling of non-linear electronic circuits.

Study results

- Understanding the different forms of expression of chaotic behavior and their modelling paradigm.
- Ability to estimate the paradigms influence on methods of mathematical modelling.
- Capability to expline different scenarious of chaotic transition, so-called "butterfly effect" and related effects of chaotic behavior.
- Ability to develop and compare the technologies of modelling for regular and chaotic processes in electronic circuits.

Organization mode of students' individual work

Students has to accomplish individual (or in group) programming exercise (in MATLAB, Scilab or OCTAVE media) with modelling chaotic behavior of non-linear dynamic process.

Evaluation of study results

- The assessment of the end-of-course examination is not below 4.
- The assesment of individual assignment is positive.

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, practical lessons, laboratory work)
1	Continuous modeling.	Lecture
2	Discreet modeling.	Lecture

3	Butterfly effect.	Lecture
4	Periodic trajectories.	Lecture
5	Logistic map and tents map.	Lecture
6	Bifurcations of the logistic map.	Lecture
7	Fractal dimension.	Lecture
8	Atractors population and dimensions.	Lecture
9	Chaotic transitions.	Lecture
10	Chaos in continuous systems.	Lecture
11	Chaos in oscillating systems.	Lecture
12	Van_der_Pol oscillator.	Lecture
13	Oscillators Chua and MLC.	Lecture
14	Chaos in electronic circuits.	Lecture
15-16	Analyse of individual assignment.	Lecture

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Circuit Theory I

(Ķēžu teorija I)

Author Māris Ēlerts, Inna Nasyr
LAIS code
Type of evaluation Exam
Credit points (ECTS) 2 credit points (3 ECTS)
Prerequisites Mathematics, physics and informatics on secondary school level
Course group

Study course objective
To prepare students for more advanced courses in circuit analysis. To develop the fundamental knowledge of basics of electricity and main laws, develop an opinion on electrical processes of electrical systems and circuit elements. To learn the mathematical and graphical tools of circuit analysis. Learn to verify theoretical laws in practical experiments. To prepare students for analyzing electrical circuits theoretically and practically.

Study results
Students should acquire an understanding of circuit theory as the theoretical basis for further learning other courses of the program of electronics, electronic devices analysis, development and synthesis. Students should acquire knowledge of stationary processes, linear circuits, tools of analysis DC and AC circuits. Students should be able to apply mathematical and graphical methods for electrical engineering challenges. Ability to plan and carry out experiments in electrical engineering, process acquired data and evaluate measurements and make conclusions. Students should learn the usage of measurement devices. The ability to practically use theoretical laws.

Organization mode of students' individual work
The study process includes four parts – lectures, tests, laboratory works and home works. The theoretical foundations of electrical engineering, basic laws and concepts are considered on the lectures. The acquired knowledge is strengthened by solving homework assignments. In the laboratories students develop practical works, process data and analyze the results. Tests imply the individual solution of standard tasks (using DC and AC circuits' analysis tools), that promotes the acquisition of knowledge and provides the opportunity to evaluate this knowledge.

Evaluation of study results
All laboratory works and home works developed and defended (15 %). Tests' ratings (35 %). Exam (50 %). Assessment of 5 % may be affected by whether the student regularly attended lectures and whether actively participated in solution of practical and theoretical challenges during classes.

Note: Students may be admitted to the examination only if they had successfully completed and defended all the home works and laboratory works. If during the term all the works performed successfully and all ratings are in the range of 6 to 10, the student may be eligible for an automatic assessment at the end of the semester.

Study course outline

Weeks	**Topic and subtopic**	**Type** (lecture, seminar, practical lessons, laboratory work)
1-2	Basic concepts of DC electrical circuits	Lecture, laboratory work
3-10	Methods for analysis and calculation DC electrical circuits	4 x lectures, 3 x seminars, laboratory work
11-12	AC circuits' elements and their properties	Lecture, laboratory work
13-16	AC circuits' calculations	2 x lectures, 2 x seminars

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Circuit Theory II

(Ķēžu teorija)

Author	Māris Ēlerts, Inna Nasyr
LAIS code	ETel2009
Type of evaluation	Exam
Credit points (ECTS)	4 credit points (6 ECTS)
Prerequisites	Higher Mathematics (derivatives, differential equations), physics (electromagnetism), informatics on the level of secondary school program. Knowledge of Circuit Theory I.
Course group	

Study course objective

To prepare students for more advanced courses in circuit analysis. To develop the fundamental knowledge of basics of electricity and main laws, develop an opinion on electrical processes of electrical systems and circuit elements. To learn the mathematical and graphical tools of circuit analysis. Learn to verify theoretical laws in practical experiments. To prepare students for analyzing electrical circuits theoretically and practically.

Study results

Students should acquire knowledge of transient response in linear electrical circuits and methods of calculation it, transmission lines with scattering parameters and nonlinear circuits. Ability to analyze processes in electrical circuits, evaluate results and make conclusions. The ability to practically use theoretical laws.

Organization mode of students' individual work

The study process includes four parts – lectures, tests, laboratory works and home works. The theoretical foundations of electrical engineering, basic laws and concepts are considered on the lectures. The acquired knowledge is strengthened by solving homework assignments. In the laboratories students develop practical works, process data and analyze the results. Tests imply the individual solution of standard tasks (transient response), that promotes the acquisition of knowledge and provides the opportunity to evaluate this knowledge.

Evaluation of study results

All laboratory works and home works developed and defended (15 %). Tests' ratings (35 %). Exam (50 %). Assessment of 5 % may be affected by whether the student regularly attended lectures and whether actively participated in solution of practical and theoretical challenges during classes. Note: Students may be admitted to the examination only if they had successfully completed and defended all the home works and laboratory works. If during the term all the works performed successfully and all ratings are in the range of 6 to 10, the student may be eligible for an automatic assessment at the end of the semester.

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, practical lessons, laboratory work)
1-4	Resonant circuits	2 x lectures, laboratory work, seminar
5-6	Coupled inductors and ideal transformer	Lecture, seminar
7-10	Three-phase circuits	2 x lectures, laboratory work, seminar
11-12	Circuits of periodic nonsinusoidal currents	Lecture, seminar
13-16	Basics of quadrupoles and filters	2 x lectures, laboratory work, seminar

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Applied Optics for Engineers

(???)

Author Jānis Harja
LAIS code
Type of evaluation Test
Credit points (ECTS) 2 credit points (3 ECTS)
Prerequisites Electricity and Magnetism, Optics and Optoelectronics.
Course group

Study course objective
Course aim is to give students basic knowledge in optics applications in engineering sciences.

Study results
- Understanding of optical applications in engineering sciences and in electronics.
- Strengthen students knowledge of optics by learning how to use experimental equipment and how to apply it for solving engineering problems.
- Sharpen students experimental skills of independent work making measurements, learn to use basic experimental equipment.
- Increase students skills to plan and carry out optical experiments, analyze the results, estimate results error, formulate conclusions.

Organization mode of students' individual work
-

Evaluation of study results
At least 5 laboratory experiments have to be carried out and assessed.

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, laboratory work)
	Spectral analysis	2 x Lectures
	Fiber optics	4 x Lectures
	Optical interferometry	2 x Lectures
	Lasers - classification, radiation properties	4 x Lectures
	Spectral analysis	Laboratory work
	Properties of optical fibers	Laboratory work
	Properties of laser radiation	Laboratory work
	Optical interferometry	Laboratory work
	Optical processing of images	Laboratory work
	Laser dopler anemometry	Laboratory work

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Mechanics

(Mehānika)

Author	Artūrs Vrubļevskis
LAIS code	Meha1001
Type of evaluation	Exam
Credit points (ECTS)	4 credit points (6 ECTS)
Prerequisites	Mathematics, Physics on secondary school level
Course group	

Study course objective
Establish importance of mechanics as an area of physics and its impact on the development of other areas. Develop understanding of the close connection between math and physics by modelling different processes and verifying those models in practice.

Study results

- Understanding of mechanical motion of bodies and its description using different models. Proficiency in using calculus for solving mechanics problems.
- Proficiency in planning and executing mechanics experiments, data processing, estimating errors in measurements and results.
- Proficiency in using measuring instruments, sensors, data loggers.
- Proficiency in applying and verifying theoretical relationships in practice.

Organization mode of students' individual work
Regular studies of course material, using study literature and lecture materials. Problems to be solved individually are assigned regularly during the semester. Consultations with the lecturer.

Evaluation of study results
Completed and defended 5 laboratory works (20%); 3 tests taken during the semester (30%); Homework assignments (20%); Exam (30%).

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, laboratory work)
1	Quantities and units. Kinematics of a point object – derivatives. Measurement errors. Introduction to laboratory work write-up.	Lecture, laboratory work
2	Kinematics of a point object – integrals. Free fall. Motion in two dimensions.	Lecture, seminar
3	Point object dynamics.	Lecture, laboratory work
4	Rotational motion kinematics.	Lecture, seminar
5	Test on topics from week 1.-3.	Test, laboratory work

6	Motion in gravitational field. Weight.	Lecture, seminar
7	Work, power, energy.	Lecture, laboratory work
8	Momentum, collisions.	Lecture, seminar
9	Test on topics from week 4.-7.	Test, laboratory work
10	Rotational motion dynamics. Rigid body rotation. Noninertial reference frames.	Lecture, seminar
11	Statics. Deformation.	Lecture, laboratory work
12	Fluid and gas mechanics.	Lecture, seminar
13	Undamped free oscillations.	Lecture, laboratory work
14	Addition of oscillations. Damped and forced oscillations, resonance.	Lecture, seminar
15	Waves, wave types and interactions.	Lecture, laboratory work
16	Test on topics from week 8.-14. Acoustics.	Test, lecture

Laboratory works

1. Verifying Newton's laws.
2. Free fall.
3. Vibrations of a string.
4. Helmholtz resonator.
5. Doppler effect.
6. Determining moment of inertia.
7. Ultrasound wave.

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Modelling of Chaotic Processes

(Haotisku procesu modelēšana)

Author Asoc. prof., dr. habil. phys. Juris Žagars
LAIS code
Type of evaluation Exam
Credit points (ECTS) 2 credit points (3 ECTS)
Prerequisites Differential Equations
Course group

Study course objective
The objective of the course is to introduce with the basics of the theory of chaos as well as with its applications for modelling of non-linear dynamic systems. Course is started with introduction of the theory of chaos in connection with the problems of modelling non-linear dynamic systems. The basic ideas are explained mainly by use of the one dimensional iterative maps under conditions when their behaviour becomes chaotic. The explanation is given for attractors, fractals, bifurcations and other key characteristics of chaos, as well as extrapolation of time series having high importance for modelling of chaotic processes.

Study results
Understanding the different forms of expression of chaotic behaviour and their modelling paradigm. Ability to estimate the paradigms influence on methods of mathematical modelling. Capability to explain different scenarios of chaotic transition, so-called "butterfly effect" and related effects of chaotic behaviour. Ability to develop and compare the technologies of modelling for regular and chaotic processes.

Organization mode of students' individual work
Students has to accomplish individual (or in group) programming exercise (in MATLAB, Scilab or OCTAVE media) with modelling chaotic behaviour of non-linear dynamic process.

Evaluation of study results
1. The mark of the exam is not below 4.
2. The assessment of individual assignment is positive.

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, laboratory work)
1	Continuous modeling.	Lecture
2	Discreet modeling.	Lecture
3	Butterfly effect.	Lecture
4	Periodic trajectories.	Lecture
5	Logistic map and tents map.	Lecture
6	Bifurcations of the logistic map.	Lecture

7	Fractal dimension.	Lecture
8	Atractors population and dimensions.	Lecture
9	Chaotic transitions.	Lecture
10	Fractal compression of digital images.	Lecture
11	Chaos in continuous systems.	Lecture
12	Chaos in oscillating systems.	Lecture
13	Chaos in conservatives systems.	Lecture
14	Controlling of chaotic systems.	Lecture
15-16	Analyse of individual assignment	Seminar

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Programming basics for microncontrollers I

(Mikrokontrolieru programmēšanas pamati I)

Author	
LAIS code	ETel3011
Type of evaluation	Exam
Credit points (ECTS)	2 credit points (3 ECTS)
Prerequisites	Basics of Digital Electronics, Computer Architecture and Structure, Programming
Course group	

Study course objective

Provide students the basic knowledge of microcontrollers' main classification, architecture, technical characteristics, specific features, programming and application. Teach to use the Atmel AVR family of microcontrollers..

Study results

- Knowledge of microcontrollers architecture.
- Skills to program microcontrollers with high level and low level programming languages.
- Knowledge of modern microcontrollers families, specific features and application.
- Knowledge of microcontrollers real-time and specialized OS.
- Knowledge of the Atmel AVR family microcontrollers internal structure and microcontroller application skills.
- Skills to use specialised software for microcontroller based schematics development, programming and simulation.

Organization mode of students' individual work

Regular study course acquaintance and revision using lecture materials, study literature and internet resources; completion of laboratory works and development of course project; consultations with lecturers.

Evaluation of study results

Successfully passed tests – 15%; Successfully completed and defended seven laboratory works – 45%; Successfully passed exam (course project) – 40%.

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, laboratory work)
1	CPU and MCU. Atmel Attiny2313 architecture.	Lecture
2	Simple input/output.	Laboratory work
3	AVR assembler basics. Input/output.	Lecture
4	Work with keyboard and LEDs' matrix.	Laboratory work

5	Programming of microcontroller with high and low level programming languages. Translation of block diagram structure into assembler.	Lecture
6	Stack and sub-program application.	Laboratory work
7	Arithmetic operations. Work with memory.	Lecture
8	Work with memory.	Laboratory work
9	Sleep modes. Interrupts. Watchdog.	Lecture
10	Watchdog.	Laboratory work
11	Counters. Timers.	Lecture
12	Counters. Timers.	Laboratory work
13	Serial communication.	Lecture
14	Serial communication.	Laboratory work
15	Microcontroller families and characteristics. Embedded systems. RTOS.	Lecture
16	Development of course project.	Laboratory work

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Optics and Optoelectronics

(Optika un optoelektronika)

Author Artūrs Orbidāns
LAIS code Fizi2002
Type of evaluation Test
Credit points (ECTS) 3 credit points (4.5 ECTS)
Prerequisites Electricity and Magnetism
Course group

Study course objective
The goal is to provide students with basic knowledge of ray and wave optics, phenomena of physical optics, and facilitate understanding of the close links between optics and electronics.

Study results
Basic knowledge of different concepts of optics – nature of light, refraction of light, reflection, interference, diffraction, interaction with substance, nonlinear optics, lasers, holography, optoelectronic devices.

Organization mode of students' individual work
-

Evaluation of study results
3-4 completed and presented laboratory works and tests 40%. The exam can be taken if the mentioned laboratory works have been presented and evaluated with a passing mark. A positive evaluation of knowledge must be achieved on the course exam (no less than 4) – 60%.

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, laboratory work)
1	Geometrical (ray) optics and its imitations. Reflection and refraction of light. Refraction index. Total internal reflection. Reflection and refraction of light at flat surfaces.	Lecture
2	Lenses and their aberrations	Laboratory work
3	Reflection and refraction of light at spherical surfaces. Convex and concave mirrors. Image formation for convex and concave mirrors. Thin lenses, focus and optical power. Lens aberration and its description models.	Lecture
4	Image formation in optical systems	Laboratory work

5	Thin lens systems, magnification. Basic schemes of optical instruments. Eye, its defects. Magnifying lens, ocular, telescope, microscope. Thick lenses. Optical qualities of nonspherical surfaces.	Lecture
6	Propagation of light in optical fibres	Laboratory work
7	Electromagnetic spectrum, the dual nature of light. Photons, their mass and impulse.	Lecture
8	Interference of light	Laboratory work
9	Interference of light. Getting coherent waves, coherence is time and space. Conditions of interference maximums and minimums. Optical path. Optical path difference. Application of interference: thin film interference, interferometers.	Lecture
10	Diffraction of light	Laboratory work
11	Polarization of light. Natural and polarised light. Brewser's law. Double refraction of light. Polarizing prisms and polarisers. Kerr effect. Optically active substances.	Lecture
12	Polarization of light	Laboratory work
13	Normal and anomalous dispersion of light. Absorption of light. Absorption spectrum. Dispersion. Examples of application of light absorption.	Lecture
14	Operation principles of lasers	Laboratory work
15	Optoelectronic devices. Sources of optical radiation, optical receivers, lasers, holography.	Lecture
16	Light propagation speed	Laboratory work

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Labour Safety and Ergonomics

(Darba aizsardzība un ergonomika)

Author Lecturer, Master of lab. prot. Varis Vītols
LAIS code
Type of evaluation Test
Credit points (ECTS) 2 credit points (3 ECTS)
Prerequisites Mathematics on the secondary school level
Course group

Study course objective
The objective of this course is to provide knowledge of any possible work environment risks, work environment conditions harmful for health and special conditions which may affect a worker's safety and health during performance of work and possible impacts on people as a result of their influence. To maintain systematic perception to help evaluate risks in human life and health (social) aspect.

Study results
As a result of the course, the student acquires the skills in working with normative acts, can practically apply the labour safety activity plan development technology, calculation of evacuation exit number and time, applying risk evaluation methods, and also can define work environment conditions harmful for health and necessary protection activities to prevent their influence.

Organization mode of students' individual work

- Studying the typical documentation regarding planning, health check, training, and risk determination.
- Studying the risk evaluation methods.
- Studying the normative acts.
- Studying the theoretical literature.
- Preparing for the final test.

Evaluation of study results
Lecture attendance shall be at least 75% of total attendance; successfully passed final test at the end of the course.

Study course outline

Week	Topic and subtopic	**Type** (lecture, seminar, laboratory work)
1	National labor protection policy. Involved parties. Social dialogue. Types of responsibility	Lecture, practice
2	The risk factors of work environment, special conditions. Negative impacts of work environment	Lecture, practice
3	Training in labor protection issues	Lecture, practice

4	Planning activities. Internal supervision of work environment	Lecture, practice
5	Health checks due to risks in work environment	Lecture, practice
6	Work equipment, the basics of work place setup, work with workstation display. Safety signs on work places. Individual protection equipment, collective protection measures	Lecture, practice
7	Work environment risk factor evaluation. Work environment risk evaluation methods	Lecture, practice
8	First aid in case of work accident. Investigation and recording of work accidents	Lecture, practice

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Programmable Logic Circuits

(Programmējamās integrētās shēmas I)

Author	Gatis Gaigals, Janis Sate
LAIS code	
Type of evaluation	Exam
Credit points (ECTS)	4 credit points (6 ECTS)
Prerequisites	Basics of Digital Electronics, Programmable Logic Circuits, Programming, Computer Architecture and Structure, Semiconductor Electronics
Course group	

Study course objective

Provide knowledge of the digital logic circuits evolution and modern logic circuits development methods. Develop skills to use logic circuit development tools.

Study results

- Understanding of modern digital logic circuits families, basic building blocks functionality and the basic characteristics of two main digital logic families.
- Understanding of digital logic circuits development starting from elementary elements leading to very large logic circuits (VLSI), from the simplest programmable logic circuits (SPLDs) to in field programmable gate array circuits (FPGA).
- Understanding of digital logic circuits development tools starting from principal electronic circuit modelling software leading to specialized programming language (VHDL, Verilog) and SoC development IDE software.
- Learned the basics of VHDL language.

Organization mode of students' individual work

Regular study course acquaintance and revision using lecture materials, study literature and internet recourses; completion of laboratory works and development of course project; consultations with lecturers.

Evaluation of study results

Successfully passed tests – 25%; Successfully completed and defended seven laboratory works – 40%; Successfully passed exam – 35%.

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, laboratory work)
1	Logic family.	Lecture
1	Combinatorial circuits synthesis and common implementation problems.	Laboratory work
2	Programmable logic circuits.	Lecture

2	Application of programmable logics in combinatorial circuit development.	Laboratory work
3	Introduction to VHDL.	Lecture
3	Introduction to VHDL.	Laboratory work
4	Modelling of competitive operators' scheme behaviour.	Lecture
4	Development of signal generators and tests in VHDL.	Laboratory work
5	Modelling of sequential circuit behaviour.	Lecture
5	Development and testing of arithmetic circuits in VHDL	Laboratory work
6	VHDL data types: simple types.	Lecture
6	Development of 3 variable 8 operation function generator in VHDL.	Laboratory work
7	VHDL data types: complex types.	Lecture
7	Application of VHDL tuning and output operators.	Laboratory work
8	Subprograms and packages.	Lecture
8	Development of sequential circuits in VHDL.	Laboratory work
9	VHDL developed technologies.	Lecture
9	Input/output.	Laboratory work
10	Synthesis.	Lecture
10	Delay, their evaluation.	Laboratory work
11	High-level design flowchart.	Lecture
11	Data sharing.	Laboratory work
12	Development of top-level design flowcharts.	Lecture
12	One clock impulse duration cycles.	Laboratory work
13	Synthesis description.	Lecture
13	Integration with the host.	Laboratory work
14	VHDL simulation, tests.	Lecture
14	Direct memory access data transfer.	Laboratory work
15	Synthesis results, placing and tracing.	Lecture
15	Modular programming.	Laboratory work
16	VITAL simulation.	Lecture
16	Pipelining.	Laboratory work

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Programming in C I

(Programmēšana I)

Author Mg. sc. comp. Dace Briede
LAIS code DatZ1007
Type of evaluation Exam
Credit points (ECTS) 2 credit points (3 ECTS)
Prerequisites N/A
Course group

Study course objective
The aim of this course is to learn programming in C, introduce students to basic concept of algorithms and programming process.

Study results
- Students have understanding about the concept of algorithms and expressing them.
- Students have learned basic syntax of C, preprocessor and standard library.
- Students have gained theoretical knowledge and experience programming in C.
- Students are able to write simple structured programs in C.

Organization mode of students' individual work
Systematic work during semester includes:
- regular learning using lecture materials, literature, internet resources,
- completion of home assignments,
- preparation for tests and the final exam,
- weekly teacher consultations.

Evaluation of study results
Course assessment consists of two parts:
- average grade for the home assignments (30% of total grade);
- exam grade (70% of total grade).

During the semester students have to take two tests. If the result of each test is 8 or higher, the student can choose not to write the exam. In this case exam grade is replaced by the average grade for tests.

Study course outline

Week	Topic and subtopic	**Type** (lecture, seminar, laboratory work)
1	Introduction to programming. Creating C programs. Compiling and executing a program. Dealing with errors. Comments	Lecture and seminar
2	Variables, arithmetic operators and their priorities; formatted output to the screen using printf().	Lecture and seminar

3	Input from the keyboard using scanf(); for loop.	Lecture and seminar
4	Logical operators, making decisions: if statement	Lecture and seminar
5	Loops while, do-while, operators break and continue.	Lecture and seminar
6	Making decisions: switch statement	Lecture and seminar
7	First test	Test
8	Nested for loops	Lecture and seminar
9	Initializing and using arrays.	Lecture and seminar
10-11	Programming exercises about previous subjects.	Lecture and seminar
12	Initializing and using two-dimensional arrays.	Lecture and seminar
13-14	Defining a function. Arguments and parameters of a function. Returning values from functions. Functions with no returning value. Variable scope.	Lecture and seminar
15	Second test.	Test
16	Concept of an algorithm, expressing algorithms. Exercises about flowcharts and pseudocodes.	Lecture and seminar

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Programming in C II

(Programmēšana II)

Author Mg. sc. comp. Dace Briede
LAIS code DatZ2006
Type of evaluation Exam
Credit points (ECTS) 2 credit points (3 ECTS)
Prerequisites Programming I
Course group

Study course objective
The aim of this course is to learn advanced programming in C, introduce students to basic concept of data structures.

Study results
- Students are able to solve practical problems programming in C.
- Students have understanding about the concept of data structures.
- Students are able to use literature and internet resources independently.
- Students are able to find, evaluate and creatively use information to complete exercises and solve problems.

Organization mode of students' individual work
Systematic work during semester includes:
- regular learning using lecture materials, literature, internet resources,
- completion of home assignments,
- preparation for tests and the final exam,
- weekly teacher consultations.

Evaluation of study results
Course assessment consists of two parts:
- average grade for the home assignments (30% of total grade);
- exam grade (70% of total grade).

During the semester students have to take two tests. If the result of each test is 8 or higher, the student can choose not to write the exam. In this case exam grade is replaced by the average grade for tests.

Study course outline

Week	Topic and subtopic	**Type** (lecture, seminar, laboratory work)
1	Repeating material from "Programming I".	Seminar
2-4	Automatic and static variables. Declaring and using pointers. Arrays and pointers. Arithmetic operations	Lecture and seminar

	with pointers. Returning multiple values from a function.	
5	Operations with strings	
6	Arrays of pointers.	
7	First test	Test
8	Recursion.	
9	Operations on bits, their applications.	
10-11	Defining and using structure types. Accessing structure members. Arrays of structures. Structures and functions, pointers to structures.	
12	Data structures. Abstract data type. List (stack, queue, double-ended queue), implementation with arrays.	
13	Dynamic memory allocation, memory leaks.	
14	Working with text files	
15	Second test	Test
16	Programming exercises about previous subjects.	Seminars

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Network Operating Systems

(Tīkli un operētājsistēmas)

Author Lect. Mag. Oec. G. Neimanis
LAIS code DziT2003
Type of evaluation Exam
Credit points (ECTS) 2 credit points (3 ECTS)
Prerequisites Linux OS proficiency, Local Area Networks
Course group

Study course objective
Provide background and practical skills in computer networking, network services and network administration.

Study results
- Background knowledge about OSI and TCP/IP.
- Practical skills to configure computer network settings and troubleshoot them.
- Practical skills to establish network services (DNS, file sharing, Samba, NFS Active Directory) and managing users.
- Background knowledge about network administration tasks.

Organization mode of students' individual work
Regular studies of course material, literature and online resources; consultations with lecturer.

Evaluation of study results
Completed assignments. Final exam.

Study course outline

Week	Topic and subtopic	**Type** (lecture, seminar, laboratory work)
1	OSI and TCP/IP. Installing and configuring Linux OS for network.	Lecture and laboratory work
2	IPv4 and IPv6. Network monitoring and traffic sniffing.	Lecture and laboratory work
3	DNS, DHCP and other LAN services. Setting up DNS server.	Lecture and laboratory work
4	User and group management.	Lecture and laboratory work
5	Sharing network resources with NFS, SMB/SAMBA.	Lecture and laboratory work
6	Windows Active Directory, Group Policies. Building AD with Windows Server OS.	Lecture and laboratory work

7	Windows Active Directory, Group Policies. Building AD with Linux/SAMBA.	Lecture and laboratory work
8	Network security. Redundancy and redundancy.	Lecture and laboratory work

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Semiconductor Electronics

(Pusvadītāju elektronika)

Author Assist. prof., Dr.s sc. ing. Aigars Krauze
LAIS code ETel1002
Type of evaluation Exam
Credit points (ECTS) 3 credit points (4.5 ECTS)
Prerequisites Mathematics and Physics on secondary school level
Course group

Study course objective
Extend knowledge of the theory and characteristics of semiconductor materials; operation and using of semiconductor devices (diodes, transistors, etc.).

Study results
- Knowledge and understanding electric charge behavior in solid state materials, electric current in semiconductors.
- Understanding structure, operation and usage of semiconductor electronic devices (semiconductor diodes, transistors, optoelectric devices, thyristors).
- Practical skills of carrying out experiments with real devices, measurement of parameters, interpret results.

Organization mode of students' individual work
Lecture notes, lecture course notes (available in the university Moodle site) independent development, additional information acquisition in the library and on the Internet. Lab report preparation and presentation. Self-dependent preparing for tests on a specific topic. Advice to the course instructor outside of class time.

Evaluation of study results
For obtaining credit points all laboratory works have to be carried out and assessed (passed). Three tests done with mark ≥4, average mark of tests develops 40% of final grade. Written exam - 60% of final grade.

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, laboratory work)
1-2	Physical basis of semiconductor devices. Electro-technical basics of electronics (repetition)	Lecture 4 h Seminar 2 h
3	Electric current in semiconductors	Lecture 2 h
4	Contact phenomenon in semiconductors. Test on Electro technical basics	Lecture 2 h Seminar 2 h
5-6	Semiconductor diode. Semiconductor diode	Lecture 4 h Laboratory work 2 h

7	Bipolar junction transistor	Lecture 2 h
8-9	BJT connections, operation modes. Test work on semiconductors, p-n junction, diodes	Lecture 4 h Seminar 2 h
10	BJT biasing circuits, quiescent point. BJT in common emitter configuration	Lecture 2 h Laboratory work 2 h
11	Field Effect Transistors	Lecture 2 h
12	Optoelectronic devices. FET in common source configuration	Lecture 2 h Laboratory work 2 h
13	Thyristors	Lecture 2 h
14	Test work on tranzistors, thyristors, opt. devices. Lab work assessment	Seminar 2 h Seminar 2 h
15	Summary of the course	Lecture 2 h
16	Repetition of main topics for exam	Seminar 4 h

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Signal Theory and Signal Processing I

(Signālu teorija un signālu apstrāde I)

Author	Jānis Trokšs, Māris Ēlerts, Modris Greitāns
LAIS code	DziT3002
Type of evaluation	Final exam
Credit points (ECTS)	2 credit points (3 ECTS)
Prerequisites	Mathematical Analysis, Linear Algebra and Analytic Geometry
Course group	

Study course objective
Provide knowledge on and practical experience with signals, mathematical recording and analysis of their data, as well as signal filtering, time-frequency analysis, analog-to-digital conversions, and digital signal processing and its uses.

Study results
- Understanding of the mathematical recording methods and processing principles of signals.
- Understanding of the description and transformation types of periodic and random signals, the essence and principles of signal filtering.
- Ability to configure and use analog-to-digital conversion systems, without any data loss during digital signal processing.
- Understanding of and practical experience with the most essential uses of digital signal processing in the processing of images, sounds and telecommunication data.
- Ability to purposefully work with contemporary signal recording and processing systems.

Organization mode of students' individual work
- Work at the library and preparation of essays.
- Performing of laboratory works in groups.
- Preparation of reports on laboratory works.

Evaluation of study results
6 laboratory works performed and defended – 30%
Exam – 70%

Study course outline

Week	Topic and subtopic	**Type** (lecture, seminar, laboratory work)
Autumn semester		
1	Signals and their classification	Lecture

2	Mathematical recording of signals, continuous-time and discrete-time signals, signal scaling and displacement operations, differentiation and integration, periodic signals	Lecture
3	Description and analysis of systems, specifications, linear systems and their special functions, convolution	Lecture
4	Correlation, energy spectral density, power spectral density	Lecture
5	Modulated signals	Lecture
6-8	Study of signal modulation principles	Laboratory work
9	Random signals	Lecture
10	Fourier series, Fourier transformation	Lecture
11-13	Uses of Fourier series, Fourier transformation	Laboratory work
14	Laplace transformation	Lecture
15	Principles of filtering, characteristic curves of frequencies, ideal filters, passive filters, active filters, digital filtering	Lecture
16	Study of filtering principles	Laboratory work
Spring semester		
17	Z-transformation	Lecture
18	Time-frequency analysis, Short Time Fourier Transform- STFT, Wigner-Ville distribution-WVD, wavelet analysis	Lecture
19	Fast Fourier Transformation (FFT)	Lecture
20-21	STFT and wavelet analysis	Laboratory work
22	A/C signal processing	Lecture
23-24	A/C signal processing	Laboratory work
25	Digital filters with Finite Impulse Response (FIR) and Infinite Impulse Response (IIR)	Lecture
26-27	Study of the principles of analog/digital signal processing	Laboratory work
28	Algorithms of digital signal processing, Finite word-length effect	Lecture
29-30	Study of digital filter operations	Laboratory work
31-32	Application of digital signal processing, processing of audio signals, image processing, types of signals in telecommunications	Individual work. Presentation of essay

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Standards and Technical Norms

(Standarti un tehniskās normas)

Author Edžus Siliņš
LAIS code ETel1003
Type of evaluation Exam
Credit points (ECTS) 2 credit points (3 ECTS)
Prerequisites N/A
Course group

Study course objective
Provide students with basic knowledge of electronics standards and technical norms. Develop information gathering and analysis skills.

Study results
Understanding of standards created by ISO and IPC. Information searching skills. Standard evaluation skills.

Evaluation of study results
2 papers must be prepared and presented (10-15 min) on a topic of choice. A positive evaluation (no less than 4) must be achieved on the test. A positive mark (no less than 4) must be achieved on the exam.

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, laboratory work)
	Generally on standardization	Lecture
	Standardization organizations	Lecture
	Technical norms to consider when designing or producing electronic devices	Lecture
	IPC Standards and learning documents	Lecture
	IPC video on application of IPC standards	Lecture
	Standards and protocols in data transmission systems and networks	Lecture

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Structure of Matter and Thermodynamics

(Vielas uzbūve un termodinamika)

Author	Artūrs Vrubļevskis
LAIS code	Fizi2001
Type of evaluation	Exam
Credit points (ECTS)	3 credit points (4.5 ECTS)
Prerequisites	Mechanics, Calculus
Course group	

Study course objective

Establish overall understanding of the three fundamental phases of matter and their common and distinct properties. Provide introduction to heat processes, heat engines, and heat pumps. Develop notion of the close connection between math and physics by modelling different processes and verifying those models in practice.

Study results

- Understanding of the structure of the matter, its three fundamental phases, phase transitions, and its description within different models.
- Understanding of heat processes, heat engines and thermodynamic quantities.
- Proficiency in using calculus for solving thermodynamics problems.
- Proficiency in planning and executing thermodynamics and matter structure experiments, data processing, estimating errors in measurements and results.
- Proficiency in using measuring instruments, sensors, data loggers.
- Proficiency in applying and verifying theoretical relationships in practice.

Organization mode of students' individual work

Regular studies of course material, using study literature and lecture materials. Problems to be solved individually are assigned regularly during the semester. Consultations with the lecturer.

Evaluation of study results

Completed and defended 4 laboratory works (20%); 2 tests taken during the semester (30%); Homework assignments (20%); Exam (30%).

Study course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, laboratory work)
1	Temperature. Thermal equilibrium. Zeroth law of thermodynamics. Heat capacity and thermal expansion. Ideal gas. Isoparametric processes. Ideal gas law.	Lecture, seminar
2	Ideal gas law	Laboratory work

3	Basics of the molecular kinetic theory of gases. Molecular velocities. Real gases.	Lecture, seminar
4	Metal heat capacity	Laboratory work
5	Heat. Heat transfer processes. First law of thermodynamics. Ideal gas internal energy.	Lecture, seminar
6	Phase transitions in liquids	Laboratory work
7	Work and heat. Quasistatic and nonstatic processes. Adiabatic processes.	Lecture, seminar
8	Phase transitions in crystalline substances	Laboratory work
9	Test on topics from week 1.-7. Second law of thermodynamics. Reversible and irreversible processes. Carnot cycle. Heat engines. Heat pumps.	Test, lecture
10	Isoprocesses	Laboratory work
11	Distributions. Barometric formula. Transfer processes.	Lecture, seminar
12	Isoprocesses	Laboratory work
13	Phase transitions, their classification. Evaporation and boiling. Condensation. Melting and crystallization. Sublimation.	Lecture, seminar
14	Metal heat conductivity and electric conductivity	Laboratory work
15	Test on topics from week 9.-13. Entropy, its statistical interpretation, and the second law of thermodynamics. Third law of thermodynamics.	Test, lecture
16	Stirling engine	Laboratory work

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English for Programming
(Angļu valoda)

Author	Dr.paed. Vita Balama, Assist Prof
Course Code	Valo1064
Form of evaluation	Exam
Credit point (ECTS credit points)	2 (3 ECTS)
Prerequisites	Secondary school level knowledge of English language (B2 level according to European Language Framework)
Course group	General education study course
Objective	To provide knowledge of business communication (oral and written), introduce comprehension of texts in the given field of IT programming.

Learning outcomes: Students are able to read, comprehend and analyze the text in English on programming topics. Individually prepare the presentations on given / chosen topics, and present them publically, answer the questions on certain issues, defend their idea, viewpoint, opinion. Students are able to correspond for business, academic and personal issues.

Organization mode of students individual assignment:
During lectures, students perform individual listening, reading and writing tasks. Besides pair- and group- work is practiced during the classes. Presentations are prepared both individually and in groups. Individual tasks are assigned for text reading and analysis. The use of internet resources for searching the information is highly advised.

Evaluation of learning outcomes:
Successful evaluation of learning outcomes is given when the following requirements are met:
1) Course attendance is at least 75% of classes (i.e. all class assignments are completed successfully);
2) Successfully passed all written midterm tests (at least 2 in a term);
3) Prepared final complete report on the chosen topic and presented during the class publically to the group;
4) Successfully passed the final exam during the exam session.

Course outline

eek	**Topic and subtopic**	**pe** (lecture, seminar, laboratory work)
1	and Oral Communication	l classes
-3	Communications: Email and Newsgroups www Website Designer	practical classes
4	Graphics and Multimedia	practical classes
-6	ation Design, Presentation Skills	practical classes
8-9	s Correspondence	practical classes
-11	Entrepreneurial Skills for Programming Writing Speaking	practical classes
13-14	in Programming Writing the Motivation Letter Filling in Application Form Designing CV	practical classes
-16	esentation on Chosen Topic	practical classes

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Web Page Programming

(WEB lietojumprogrammu izstrāde)

Author	Agris Traskovs
Course Code	DatZ1032
Form of evaluation	Exam
Credit point (ECTS credit points)	4 **(6 ECTS)**
Prerequisites	OOP, Web development 101
Course group	Industry study course

Objective

Give the students insight on modern web application frameworks, REST API usage and practical experience creating responsive web applications.

Learning outcomes:

Students have insight in web technologies currently used in industry.
Students have attained practical skills in creating web applications.
Can use most common data structures and formats in web communication.
Have an understanding how different Javascript frameworks function

Organization mode of students individual assignment:

The course consists of contact hours with students and their independent work with literature and internet resources. Contact hours include theoretical lectures and practical sessions, where students strengthen their theoretical knowledge implementing the things learned in the theoretical part of the course.

Evaluation of learning outcomes:

Final grade is composed of 50% grade in the final exam, 50% grades in practical assignments, both must be higher or equal to 4 on a scale of 10.

Course outline

Week	Topic	Type (lecture, seminar, laboratory work)
1	Introduction to currently used technologies. Architectural influence in web application development. Single page applications.	Lecture, seminar
2	**Fundamentals of web page creation**. HTML5, CSS3. Images and different media usage.	Lecture, seminar
3	Responsive design, flexible grids. DOM and its usage in element distinction and search	Lecture, seminar
4	**Frontend templates and tools.** LESS/SASS, Gulp, ES6 templates, Handlebars, Git	Lecture, seminar
5	**JQuery.** What is JQuery, when to use it. Basic formatting functions, advanced data processing.	Lecture, seminar

6	**Communications used in web applications**. Ajax calls JSON, XML data structures. REST API, their usage.	Lecture, seminar
7	**Javascript Frameworks**. Controllers and data binding. EmberJS	Lecture, seminar
8	**Javascript Frameworks**. Services. Data manipulation operations. Components and directives. AngularJS	Lecture, seminar
9	**NodeJS.** NPM,Callbacks, usage and different features	Lecture, seminar
10	**Webpage security**: Authorization/ Authentication. OAuth. Testing functionality and security. Communication security issues.	Lecture, seminar
11	Webpage architecture, Project planning, process automation.	Lecture, seminar
12-16	Course Project in groups	Laboratory work

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UNIX like system administration

(UNIX sistēmu administrēšana)

Author	Lector, Mg.oec. , Gints Neimanis
LAIS course code	DatZ2019
Form of evaluation	Exam
Academic credit points (ECTS credit points)	2 (3 ECTS)
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	
Part of the study programme	Industry study courses

Study course objective

The study course objective is to provide knowledge of the fundamentals of the UNIX like operating systems and give skills to work with their tools, to configure and to manage UNIX like systems.

Study results

- Having acquired the study course, a student:
- Is able to describe Unix un Linux like systems history.
- Is able to describe the architecture and environment of Linux like systems.
- Is able to identify different system services.
- Is able to use command line tools to manage Linux like systems.
- Is able to monitor and troubleshoot the system and services.

Organization mode of students' individual work

- The individual work of students include:
- a regular learning of the course by using study literature, internet resources,
- a regular learning of the course by using lecture materials,
- hands-on labs
- course paper development,
- preparations for the labs, tests and exams.

Evaluation of study results

Final mark depends on Exam (100%). It is mantadory to pass all labs

Study course outline

No.	Title of the topic
1.	Unix like operating system hisotry.
2.	Introduction to command line tools.
3.	Various Package management systems.
4.	Management of users, groups and access rights.
5.	Network configuration and services.
6.	Management of system runlevels, boot order.
7.	Automatization of tasks, backup management.
8.	System resource and proceses monitoring un management.
9.	Managing of system daemons.

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Software Testing and Debugging Technologies and Principles

(Programmatūras testēšana un atkļūdošanas tehnoloģijas un principi)

Author	Mg.sc.comp. Ervīns Grīnfelds, Mg.sc.comp. Andrejs Frišfelds
Course code	DatZ1030
Examination form	Exam
Credit points (ECTS credit points)	2 (3ECTS)
Preconditions for starting of the course	JAVA programming
Course group	Industry study course

Course objective
The course objective is to provide students with knowledge on testing processes in software development, to give understanding about practical implementation of testing, using various testing methods and environments.

Study outcomes

- to understand and know basic concepts of testing
- to understand the role of testing in the software development process
- to understand testing methods
- to be able to apply software testing tools
- to be able to plan software testing
- to understand testing implementation in Agile projects
- to demonstrate skills in webpage testing, server testing and security testing
- Type of organisation of students' independent work
- For strengthening their knowledge, students use lecture materials, materials of practical classes and relevant literature.

Assessment of study outcomes
The final assessment is comprised of

- 25% exam
- 65% - practical works that have to be conducted during studies (mobile apps automation task, development of test examples, testing, development of REST API test examples, development of automation of web solutions)
- 10% - activity in lectures, practical works

Course contents

Week	Topic and subtopic	Type **(lectures, workshops, practical classes, laboratory works)**
	Introduction (testing necessity, industry standards, practical examples)	lecture (90 min.)

	Team work - to distribute to teams real webpages/apps etc. and give a certain period of time to find the main problems. When the time is out, to collect the list of all problems and ask questions that had to be considered/understood to be able to start testing a solution/product, and what types of testing were implemented by students to find deficiencies/problems. Work with the test management tool Tarantula or TestRail (basics). Objective = to come to the next topic - types of testing, in order to understand, that there are several levels of testing - starting from code level to UI level, specification level etc., as well as functional and non-functional testing.	Practical class (90 min.)
	Types of testing (black box, white box, functional, non-functional testing)	lecture (90 min.)
	To demonstrate on a simple JAVA code, how a unit test example looks like, how it is written, saved and ran. Another important thing to show in this lecture is how unit test “fails” and what message is displayed to the programmer. To give students access to a code and assign each student to write 3 unit tests for an app (even if it is a calculator written in JAVA code) The task for team work - together with the teacher figure out conceptually, what should be tested/planned for testing, when developing a social network, which will operate on mobile/web platforms, and on which 10M users are expected	Practical class (90 min.)
	Development of testing strategy, test planning and management	Lecture (90 min.)

	Practical works: * A task is given to conduct testing of NotifyUs.net app server, where the tester has limited resources and time, funds, available workforce, devices etc. - how it is planned, how it will be done (group work, where each group proposes their own vision and each group has different limitations - for one group - time, for another group - budget, for another one - human resources, and some groups have to plan server PATCH to product environment, if the problem is already in the product) * The task is to develop a general testing concept (in its essence, not a formal plan) with things to be tested while planning a product of mobile app + server app * To become acquainted with Jira project management tool, to go through together with the teacher, how defining of tasks is done, how sprint planning and closing of tasks is implemented, without forgetting, how testing during sprint and accept testing for versions is done * To become acquainted in-depth with the test management tool Tarantula or TestRail with the task to define in the tool test examples for a specific system/app. * To perform testing on any IT product, to give a task to define in Jira task management tool a problem message for any found problem and deficiencies	Practical class (180 min.)
	Testing in various elaboration methodologies, in-depth insight into Agile methodology.	Lecture/Practical class (180 min.)
	White box testing - debugging, unit testing, integration testing.	Lecture with examples (90 min.)
	Testing of webpages (used tools, technologies, types of testing)	Lecture (45 min.)
	Practical tasks: * To conduct testing on any of most popular webpages, using free web solution validators * By using Selenium tool, to develop a web automation task for web solutions as www.testdevlab.com or www.notifyus.net (task comprises of 2 parts - defining of test examples in the test management tool TestRail or Tarantula, and their actual automation by using the Selenium tool. Approximately 5 test examples with 15 validations should be automated)	Practical class (135 min.)
	Testing of mobile devices (used tools, technologies, types of testing)	Lecture (45 min.)

	* The elaboration environment has to be installed on computers with android SDK for this task!!! Students are given a simple, ready android app product. A few integration tests are written during the practical work on JAVA for android app. * Students are given a simple android app, which does not present wide functionality and is only a simple client's app. Students are given a task to develop automated tests for this app by using Robotium framework (the task as in the case with 5.2 Web - first to define, and then - automate. Up to 5 test examples with 15 validations should be automated) * Students are shown, how Calaba.sh framework is used to set a mobile device testing and development continuous integration solution, where it is ensured, that tests are booted after a specific period of time or particular command (learned/discovered risks - Jenkins, Teamcity, Calaba.sh)	Practical class (135 min.)
	Server (backend) testing (used tools, technologies, types of testing) + practical task to perform REST API testing, using JMeter and Apimation tools	Lecture/Practical class (180 min.)
	Security testing (theory, necessity, practical examples and tasks)	Lecture/Practical class (90 min.)

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Software Architecture Design

(Programmatūras arhitektūras projektēšana)

Author	Mg.sc.ing. Edgars Palacis
LAIS course code	DatZ1031
Form of evaluation	Exam
Academic credit points (ECTS credit points)	2 (3 ECTS)
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	Knowledge of JAVA programming basics
Part of the study programme	Industry study course

Study course objective

The study course objectives are to introduce students with the requirements of the architecture of the modern application; to create understanding of the preference of the most suitable architecture regard to functional requirements of the application and target markets.

Study results

Having acquired the study course, a student:

- Is capable of understand of several architectures types of applications, its advantages and disadvantages
- Is able to avaluate the most suitable architecture solution for a specific project
- Is able to create a simple Web service based on REST API

Organization mode of students' individual work

The independent work of students include:

- **a regular learning of the course by using lecture materials, study literature, internet resources,**
- **development of seminar assignments,**
- **weekly consulting session with the lecturer**

Evaluation of study results

The end result is made of:

- exam/semester project (50%),
- theoretical tests (10%)
- practical assignments (20%)
- practical tests (20%)

Study course outline

No.	Title of the topic

1.	Service oriented architecture, types, specific features and the most popular application (SOAP, REST, WCF, ActiveMQ, etc)
2	REST services, the most important aspects of the implementation. REST development tools
3.	Data exchange formats: XML and JSON, advantages and disatvantages. Development tools
4.	Types of the application architecture. Monolithic applications, modular application, web services, microservices
5.	Conventional abstraction level of the application structure
6.	**Domain driven design pattern**
7	Architecture of the microservices, its features, nuance of the implementation
8	**Server-less arcihtecture**

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Software Engineering

(Programmatūras inženierija I un II)

Author	Dr.sc.ing., doc. Raita Rollande, mg.sc.comp. lekt. Karina Šķirmante
LAIS course code	DatZ1029 and DatZ2016
Form of evaluation	Test and exam(After 2nd semester - test, after 3rd - exam)
Academic credit points (ECTS credit points)	6 (9 ECTS)
The total number of contact lessons	48
The number of lectures	12
The number of practical classes	36
Prerequisites	JAVA Programming, Data bases
Part of the study programme	Industry study courses

Study course objective

The objective of the course is to introduce students to design theoretical aspects of information systems analysis and design, and to develop practical skills in information systems development.

Study results

Having acquired the study course, a student:

- Is able to understand the role of design in the development of information systems.
- Is able to understand the software development stages, models and works to be executed in each phase, phase deliverables and documentation.
- Is able to choose the information systems development model based on the characteristics of the developed system.
- Is able to apply the information system design standards, create the concept description, software requirements specifications description, and software design description documentation.
- Is able to prepare a user manual of IS
- Is able to plan IS development project, to predict the run time of the tasks and its capacity, to plan individual tasks and control its, to take a part in discussions about project progress
- Is able to plan the IS project, to develop programming guidelines, to read and understand the requirements of the IS specifications, to understand the standards of the IS design outlines, to prepare and describe an architecture of the software, to analyse a different technical solutions and to choose the most suitable, to create a conceptual and physical data model, to create a relational model.
- Is able to design, construct and describe algorithms
- Is able to design user interfaces

- Is able to prepare documentation of the design project
- Is able to program and write a code based on the design documentations and guidelines
- Is able to write a code, to read and understand software design outlines
- Is able to analyse the input and output data of the program
- Is able to represent the project. Is able to present the project for large audience.

Organization mode of students' individual work

The independent work of students include:

- Teamwork. Based on the proposed problem, students in groups develop: a description of the concept, software requirements specification, software design description of the system, design prototypes, carry out testing. Preparation for the exam.

Evaluation of study results

- Team work (100%)

Study course outline

No.	Title of the topic
1	General conception of information system analysis and design. Types of information systems. Work characteristics of information system analysts, consultants, and experts
2	With the development of information systems related to professional standards.
3	Information system architecture. Information system development. Information system life cycle models Lecture (waterfall life cycle model, shell model; rapid prototyping model, etc.). Agile modeling
4	Students division into teams for system development. Preperation of the development enviroment.
5	System requirements collection methods. Interviews. Interviews organization. Questions formation. Interview process. Summing up and analysis of acquired data
6	Interview planning. Meeting with system contractors. Interviewing contractors. Analysis of the results of the interview.
7	Agreements. Types of agreements. Information system documentation standards. Software development standards. Software engineering standards. Necessary documentation for software usage and maintenance. Information systems documentation - concept description. Content of the concept description
8	Project Planning. Sprint Planning
9	The use of diagrams in information system analysis and design. Organization diagrams, entity relationship diagrams, data flow diagrams, business process diagrams.

1	Meeting with system contractors. Clarification of issues related with concept description development. The use of diagrams in information system analysis and design
1	System requirements analysis. Prototypes. The role of prototype in information system design
1	The 1st Sprint Review.
1	Information systems documentation - concept description. Content of the concept description.
1	Concept description presentation and delivery. Nest sprint Planning.
1	Information systems documentation - software requirements specification description. Content of the software requirements specification description
1	Meeting with system contractors. Clarification of system requirements
1	Project Planning
1	The 2nd Sprint Planning. The 2nd Sprint Realization
1	The 2nd Sprint Realization
2	The 2nd Sprint Documentation
2	The 2nd Sprint Review
2	The 2nd Sprint Retrsospective and the 3rd Sprint Planning
2	Information System user guide. User guide for the programmer and the end user
2	The 3rd Sprint Realization
2	The 3rd Sprint Documentation
2	The 3rd Sprint Review
2	The 3rd Sprint Retrsospective and the 4th Sprint Planning
2	Quality assurance. The efficient usage of resources. Cost control. Customer satisfaction
2	The 4th Sprint Realization
3	The 4th Sprint Documentation
3	The 4th Sprint Review

3	The 4th Sprint Retrsospective and the 5th Sprint Planning
3	The introduction and maintenance of the information system. Maintenance of the information system and service contract.
3	The 5th Sprint Realization
3	The 5th Sprint Documentation
3	The 5th Sprint Review and Retrospective.
3	Final Presentation

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Security of Information Systems

(Informāciju sistēmu drošība)

Author	Sanita Meijere
Course Code	DatZ2013
Form of evaluation	Exam
Credit point (ECTS credit points)	2 (6 ETCS)
Prerequisites	n/a
Author	Sanita Meijere
Course group	General education study course

Course description
Create awareness of the significance of information security and continuous growing of risks. Explain key information security protection principles and mechanisms, global best practices in the field and Information Security Management Standard`s requirements. Information systems` security in the internal infrastructure and cloud if outsourced. Secure programming principles. Secure information systems` architecture.

Learning outcome
By completing the course students will be aware of key definitions of information security, necessity of information systems` protection and protection mechanisms. The same students will be aware of global best practices in organising information systems` security, its management and risk treatment.

Students independent work – study of the materials

Grading scheme 70% class participation, 30% final exam

Course schedule

Lectures	Topic	Type
1	Basics of information systems security	Lecture & seminar
2	Cybercrime	Lecture & seminar
3	Social engineering	Lecture & seminar
4	Secure internal IT infrastructure	Lecture & seminar
5	Secure IT infrastructure in cloud	Lecture & seminar
6	Policy and principles of secure programming	Lecture & seminar
7,8	Information systems` security management	Lecture & seminar

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Mathematics for Programmers

(Matemātika programmētājiem)

Author	mg. math. Jeļena Mihailova mg. paed. Estere Vītola
Course Code	Mate1022
Form of evaluation	Examination
Credit point (ECTS credit points)	8 (12 ECTS)
Prerequisites	Secondary School Mathematics
Course group	General education study course

Objective

Understand the importance of mathematics in programming and programming capabilities in solving mathematical problems. Learn mathematical and algorithmic thinking.

Acquire the basics of linear algebra, analytic geometry, vector algebra, mathematical analysis and probability theory using programming.

Acquire the skills to create simple computer programs using the programming language Python to solve mathematical problems.

Learning outcomes

Students understand the basic concepts and rules of set theory and mathematical logic and can to apply that for problems solve.

Students are able to take basic operations with matrices and to solve linear systems by Cramer's rule, by Gaussian elimination, by finding the inverse of the coefficient matrix.

Students are able to take operations with vectors in plane in geometrical form and in component form. Understand and use the dot product for problems solved.

Students are able to find distance between two points in plane; to write the equation of the straight-line in plane and space and the equation of the plane.

Students understand the basic concepts and rules of mathematical analysis, to solve standard problems (finding function limit, derivate functions, integrate functions, construct function graphics).

Students are able to calculate a probability of the random events; to understand the difference between discrete and continuous random variables; to calculate the numerical characteristics (mathematical expectation, variance, etc.). Students know the most important probability distributions of the random variables. Students are able to understand the basic concept of sampling and processing of statistical data.

Students can apply the acquired mathematical knowledge to solve practical problems.

Students are able to develop algorithms and create simple computer programs using the programming language Python to solve mathematical problems. Students are able to write a well-structured, readable and properly commented source code; to detect and correct errors in the source code; students are able to find an appropriate solution of the problem, explain and justify it.

Students are able to work independently with literature and Internet resources.
Students are able to write bachelor paper in accordance with the methodological instructions of the faculty; use spreadsheets.

Organization mode of students individual assignment
Regular learning using lecture materials, internet resources, software help systems. Individual assignment completion. Weekly teacher consultations.
Preparations for the tests and exams

Evaluation of study results
Final evaluation includes:
1. Regular and independent work during the semester (50%) that includes:
    - active participation in seminars, practical classes and lectures (5%);
    - practical assignments/home works (20%)
    - tests (25%)
2. Final exam (50%)

Course outline

No. of the class/topic	Title of the topic	Type of class (lectures, seminars, practical classes, laboratory work), amount of academic hours
1.	**Introduction to programming with Python**	8 h
	Characteristics of the programming language Python. Python environment. Creating a Python program (script). Variables and data types (integers and floats, large integers, and others). Python memory management. Counting systems. Arithmetic operators. Input and output. Python modules. Module math.	Lectures – 2 h Practical classes – 6 h
2.	**Basic concept of Set Theory and Mathematical Logic**	14 h
	Concept of a set. Description of the set. Operations with sets. Proposition. Logical operations. Truth tables. Tautologies. Logical Equivalence. Normal forms. Principle of duality. The predicate. Logical operations with predicates. Relation and logic operations. Loops and branching constructions.	Lectures – 3 h Seminars – 3 h Practical classes – 8 h

	Sequential Data Types (List, Set, Tuple). Various actions with Sequential Data Types.	
3.	**Matrices. Determinants. Linear Systems**	24 h
	Introduction to Matrices and Linear Systems. Matrix types. Basic operation of matrix (adding, subtracting, multiply of a matrix by a constant). Multiplication of matrices. Algebraic properties of matrix operations.	Lectures – 6 h
	Determinants of a matrix of order 2 and of order 3. Properties of the determinant. Minors and cofactors. Determinants of matrices of higher order. General formula for the determinant.	Seminars – 6 h
	Cramer`s Rule to solve the linear systems. Invertible matrix. Finding the inverse A^{-1} of the invertible $n \times n$ matrix A. Matrix equations. Solving the linear system by finding the inverse of the coefficient matrix. Gaussian elimination. Solving the linear systems by Gaussian elimination. The rank of a matrix. Kronecker-Capelli's theorem. Homogeneous systems. Definition of functions. Two-dimensional array as matrix representation. Basic operations on arrays - matrix operations. Solving linear equation systems. Python extension module NumPy.	Practical classes – 12 h
4.	**Vektor Algebra**	12 h
	Definition of a vector. Types of vectors. Operations on vectors (adding, subtracting, multiply by a scalar). Properties of these operations. Projection of a vector. Vectors in two- and three- dimensional Cartesian coordinates. The component of a vector. Operations on vectors in component form. The dot product. Properties of the dot product. Array as vector representation. Operations on vectors. Python extension module NumPy.	Lectures – 3 h Seminars – 3 h Practical classes – 6 h
5.	**Coordinate Systems in plane. Line in plane. Lines and surfaces in space**	22 h
	Cartesian coordinate system. Polar coordinate system. Line in the plane and its equation; polar equations. Parametric equations of line. Straight-line in plane, its equation and direction coefficient. Angle between straight lines. General straight-line equation and its line segment equation. Intersection	Lectures – 5 h Semināri – 5 h Practical classes – 12 h

	of straight lines, conditions of parallelism and congruence. Normal equation of straight line. Basic concept of the conic sections: the ellipse, the hyperbola, the parabola (general form and standard form). Equation of a plane in space. Equation of a straight line in the space, its canonical and parametric forms. Basic concept of the second-order surfaces (ellipsoid; one-sheet and two-sheet hyperboloid; second-order cones and cylinders; elliptic and hyperbolic parabolic). Data visualization. Graphic design. Python module Turtle. Python extension module Matplotlib.	
6.	**Introduction to Mathematical Analysis**	22 h
	Basic concept of a limit of function. The algebraic properties of limits. One-sided limits. Infinite limits. The problems with indeterminate forms. The derivative of a function, it's geometric and mechanics interpretations. Continuity of a differentiable function. Differentiability of a sum, of a product and of a quotient. Differentiability of composite function (The Chain Rule). Derivatives of some Elementary Functions. Higher order derivatives. Curve sketching using differentiation. A primitive (antiderivative) of function. Indefinite integral. Properties of indefinite integrals. Basic integration formulas. The simplest integration substitutions. The problem of area and the definite integrals. Python extension modules NumPy and SymPy.	Lectures – 8 h Seminars – 8 h Practical classes - 6 h
7.	**Basic concepts of Probability Theory and Mathematical Statistic**	26 h
	Basic concepts of the probability theory. The random events and algebra of events. Definition of probability. Addition and multiplication laws of	Lectures – 8 st. Seminars – 6 h

probabilities. Conditional probability. Total probability and Bayes' formula. Bernoulli Trials. Random variable (definition and classification). Functions of a random variable (distribution and density functions). Discrete random variables. Expected value (mathematical expectation), variance and standard deviation of a discrete random variable; properties. The most important probability distributions of discreet random variables: uniform, hypergeometric, binomial, geometric, the Poisson distributions. Continuous random variable. Probability density function and distribution function. Expected value and variance. The most important probability distributions of continuous random variables (exponential, uniform, normal, t-distribution). Strong law of large numbers. Introduction to Statistic. Descriptive statistics (collecting and presentation of statistical data; cumulative sample distribution function). Inductive statistics (random sampling and sampling distributions). Reading information from a file (text file and .csv file). Plotting. Python module statistics. Python extension module NumPy.	Practical classes - 12 h

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Parallel computing

(Paralēlā programmēšana)

Author	Mg.sc.comp. Kristaps Gromovs
LAIS course code	DatZ2020
Form of evaluation	Exam
Academic credit points (ECTS credit points)	2 (3 ECTS)
The total number of contact lessons	16
The number of lectures	6
The number of practical classes	10
Prerequisites	Basics of JAVA programming language
Part of the study programme	Industry study courses

Study course objective

The study course objective is to master parallel computing and programming application basic concepts, develop knowledge base to apply it in solving simple tasks that require parallel computing, develop knowledge base for programming syntax used for parallel computing in different programming languages.

Study results

Having acquired the study course, a student:

- Is capable of distinguishing tasks that can be solved using parallel computing approach.
- Understands parallel computing paradigm and why there is necessity for parallel computing.
- Is aware of multicore processing unit architecture.
- Is able to explain the difference between concurrent and parallel computing approaches.
- Is capable of parallelizing algorithms and is able to identify algorithms (or their parts), that can't be parallelized.
- Is able to solve simple tasks using parallel computing paradigm.
- Is aware of newest technologies and industry trends for applications that are using parallel computing paradigm.

Organization mode of students' individual work

The independent work of students include:

- a regular learning of the course by using lecture materials, study literature, internet resources,
- course project development,
- work with parallel computing samples,

- preparations for the exam.

Evaluation of study results

The end result is made of:

- Course project 20%,
- Exam 80%

Study course outline

No.	Title of the topic
1	Introduction to parallel computing.
2	Introduction to multicore processing unit architectures.
3	Concurrent and parallel programming models.
4	Introduction to parallel computing application concepts in different programming languages.
5	Parallelization of algorithms.
6	Introduction to different parallel computing language syntaxes.
7	Newest technologies and trends in parallel applications.

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Fundamentals of JAVA Programming

(Programmēšanas pamati JAVA)

Author	Mg. sc. comp. Karina Šķirmante
Course Code	DatZ1027
Form of evaluation	Exam
Credit point (ECTS credit points)	4 (6 ETCS)
Prerequisites	n/a
Course group	Industry study course

Objective

To acquire basic knowledge of algorithms and program development process. Learn algorithmic thinking. Understand and be able to apply procedural programming approach to program development process by using the programming language JAVA.

Learning outcomes

- Able to develop applications (programs) using the programming language JAVA in accordance with good programming practice.
- Able to detect and correct errors in the source code.
- According to requirements of the problem are able to find an appropriate solution and to justify it.
- Able to analyze and explain the JAVA source code.
- Able to work independently with literature and internet resources.

Organization mode of students individual assignment

Systematic work during semester includes:

- regular learning using lecture materials, literature, internet resources,
- completion of home assignments,
- preparation for tests and the final exam,
- weekly teacher consultations.

Evaluation of learning outcomes

Course assessment consists of three parts:

- average grade for the home assignments (30% of total grade)
- average grade for the theoretical tests (20% of total grade)
- exam grade (50% of total grade)

During the semester students have to take two practical tests. If the result of each test is 8 or higher, the student can choose not to write the exam. In this case exam grade is replaced by the average grade for practical tests.

Week	Topic and subtopic	Type **(lecture, seminar, laboratory work)**
week1 day1	Introduction to programming; Creating JAVA programs; Compiling and executing a program; Dealing with errors; Comments;	Lecture and seminars
week1 day2	Variables, arithmetic operators and their priorities; Usage of System.in and System.out classes for input/output; Logical operators, making decisions: if statement.	Lecture and seminars
week1 day3	Loops for, while, do-while, operators break and continue; Making decisions: switch statement.	Lecture and seminars
week1 day4	Theoretical test No.1; Practical exercises;	Seminar, test
week2 day1	Initializing and using arrays; Initializing and using two-dimensional arrays.	Lecture and seminars
week2 day2	Defining a function; Arguments and parameters of a function; Returning values from functions; Functions with no returning value; Variable scope.	Lecture and seminars
week2 day3	Theoretical test No.2; Practical test No.1	Seminars, tests
week2 day4	Basic concepts of Object-oriented programming (OOP); Class as an abstract data type. Object as a class instance; Class implementation in the programming language JAVA; Access levels; Encapsulation and hiding.	Lecture and seminars
week3 day1	Constructors; The default constructor; Overloaded constructors	Lecture and seminars

week3 day2	Various associations between classes, such as a-kind-of, part-of, has-a; Using UML use to represent association between classes; The composition and aggregation; Inheritance: the base class and inherited class.	Lecture and seminars
week3 day3	Practical exercises	Seminars
week3 day4	Theoretical test No.3; Practical test No.2	Tests

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JAVA Programming

(Programmēšana JAVA)

Author	Mg. sc. comp. Karina Šķirmante
Course Code	DatZ1028
Form of evaluation	Exam
Credit point (ECTS credit points)	2 (3 ETCS)
Prerequisites	Basics of programming language JAVA (course "Fundamentals of JAVA programming")
Course group	Industry study course

Objective

Objective of this course is to introduce students to JAVA programming language and different modern technologies connected to them as well as to give students basic understanding about the advantages and shortcomings of these technologies and their main cases of usage.

Learning outcomes

After finishing this course students must have basic knowledge about JAVA programming language. Students must understand the possibilities and advantages of using these technologies and they must be able to develop some basic applications using JAVA about the topics covered throughout the course.

Organization mode of students individual assignment

Students must attend lectures or read the according information from the provided presentations or other sources (including internet). Laboratory work. Weekly consulting session with the lecturer is available.

Evaluation of learning outcomes

Final evaluation includes:

- exam/semester project (50%),
- theoretical tests (10%)
- practical assignments (20%)
- practical tests (20%)

Week	Topic and subtopic	Type **(lecture, seminar, laboratory work)**
1	OOP : variables and their types, concepts of program, commands, operators	**Lecture and seminar**
2	OOP: inheritance, polymorphism, interfaces	**Lecture and seminar**
3	**Exceptions;** **JAVA IO**	**Lecture and seminar**
4	**Version control;** **JAVA Unit Tests**	**Lecture and seminar**
5	**Threading**	**Lecture and seminar**
6	**Networking**	**Lecture and seminar**
7	**Connections with database, queries and implementation of results**	**Lecture and seminar**
8	**Practical work**	**Laboratory work**

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Software Design Patterns

(Programmatūras izstrādes šabloni I un II)

Author	Ralfs Lasmanis
LAIS course code	DatZ2014 and DatZ2015
Form of evaluation	Exam
Academic credit points (ECTS credit points)	6 ECTS
The total number of contact lessons	32
The number of lectures	16
The number of practical classes	16
Prerequisites	Basics of JAVA programming language.
Part of the study programme	Industry study course

Study course objective

The study course objective is to learn object-oriented programming (OOP) design principles and various OOP design patterns in Java programming language, to be able to solve various design problems by using established best practice approaches.

Study results

Having acquired the study course, a student:

- Is able to articulate the challenges involved in building complex software systems and the need for a systematic engineering approach to cope with these challenges.
- Is able to describe how patterns can be used to create reusable abstractions in the design of complex systems.
- Is able to compare and contrast how generic programming and pure object-orientated programming are used in pattern design.
- Is able to differentiate between idioms, design patterns, and architectural patterns.
- Is able to explain the consequences of using anti-patterns in software design.
- Is able to describe the design, use, and consequences of the Gang of Four and GRASP design patterns.
- Is able to describe the relationships and dependencies between GRASP patterns, Gang of Four Patterns, and the principles of object-oriented design.
- Is able to identify and use available resources to research various patterns.
- Is capable of applying OOP principles, GRASP, and Gang of Four design patterns to overcome real design challenges.
- Is capable of using UML diagrams for documenting the design of software.
- Is capable of identifying the use of various patterns in Java SE.

- Is capable of creating a clean and maintainable object-oriented designs by using best industry practices.

Organization mode of students' individual work

The independent work of students includes:

- a regular learning of the course by using lecture materials, study literature, internet resources,
- homework assignment completion,
- course project development,
- preparations for the tests and exams.

Evaluation of study results

The end result is made of:

- Performance in classes 10%
- Practical classes and homework 15%
- Tests 25%
- Course project 50%

Or:

- Exam 100%

Study course outline

No.	Title of the topic
1	Software development challenges and complexities.
2	UML diagrams, and their use in describing object-oriented design.
3	Principles of object-oriented design.
4	GRASP design patterns.
5	Gang of Four design patterns.
6	Clean code, code maintainability, and code refactoring techniques.

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Basics of IT industry rules & regulations & standards

(IT nozares tiesību pamati un standarti)

Author	Sanita Meijere
Course Code	Ties1002
Form of evaluation	Exam
Credit point (ECTS credit points)	2 (6 ETCS)
Prerequisites	n/a
Course group	General education study course

Course description

Explained basics of IPR, Copyright law, Patent Law, Law on physical persons` data protection, classification of cybercrime, Information security law. Explained quality management and Quality management standard ISO 9001. Explained Information security management standard ISO 27 001.

Learning outcome

By completing the course students will be aware of key aspects of IPR, its necessity and mechanisms and the most essential international and national rules and regulations in the field. Besides that, students will be aware of key quality and information security management tendencies and requirements based on the best practices.

Students independent work – study of the materials

Grading scheme 70% class participation, 30% final exam

Lectures	Topic	Type
1	**IPR**	**Lecture & seminar**
2	**Copyright**	**Lecture & seminar**
3	**Patents**	**Lecture & seminar**
4	**Physical person data protection**	**Lecture & seminar**
5	**Cybercrime**	**Lecture & seminar**
6	**Information security**	**Lecture & seminar**
7,8	**Quality management**	**Lecture & seminar**

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IT Project Management

(IT projektu vadīšana)

Author	Mg.oec Uldis Kuplis
Course Code	Citi1041
Form of evaluation	Test
Credit point (ECTS credit points)	2 (3ECTS)
Prerequisites	None
Course group	General education study course

Objective

The course objective is to understand theoretical basics of IT projects management processes and practical case study.

The course content is focused on organizing and management of software development projects. It ensures students comprehension of working as a team, management processes inside a project and organizational activities during project lifecycle.

Learning outcomes

The course outcomes are:

- To understand basic concepts of IT project management
- To be able to plan a project and document it
- To create project organizational structure
- To understand project lifecycle and its processes
- To understand responsibility of project manager role
- To estimate project workload
- To understand project cost calculations and risk management
- To be able to choose the most appropriate software development methodology

Organization mode of students individual assignment

All study resources (presentations, tasks and links to additional reading texts) will be available in electronic format.

Evaluation of learning outcomes

Students will be graded on their work during a semester. The grade will be calculated on their contribution, quizzes, group work and final test.

Grading for the course is as follows:

Assignments	Points

Contribution in class discussions	20
Quizzes	20
Team presentation	30
Final test	30
Total	100

Minimum points are 40 in order to pass the course evaluation.

Course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, laboratory work)
1. (2x90min)	Project and management basic concepts	Lecture
	Types of software development projects and appropriate methodologies	Seminar
3. (2x90min)	Project planning, project team, structure and roles	Lecture
	Project risk and resources management	Seminar
5. (4x90min)	The most popular software development methodologies – waterfall, agile, etc.	Seminar
7. (2x90min)	Project control, delegating, project manager's role, project closing	Lecture
	Case study and analysis	Practical work
9. (2x90min)	Project management tools	Seminar
	Final test	Test
11. (4x90min)	Final test review	Seminar
	Teamwork presentation	Practical work

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Internet and Computer Networks

(Interneta un datortīkla tehnoloģijas)

Author	Mag.oec. Lecturer Gints Neimanis
LAIS course code	DatZ2018
Form of evaluation	Exam
Academic credit points (ECTS credit points)	2 (3 ECTS)
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	
Part of the study programme	Industry study courses

Study course objective

Provide knowledge of local and global computer networks and their technologies. Get skills to configure, use and troubleshoot computer networks.

Study results

Having acquired the study course, a student:

- Is able to explain OSI and TCP/IP model.
- Is able to describe network functions on various OSI levels and Internet protocols.
- Is able to configure network settings on computer systems.
- Is ables to troubleshoot network errors.

Organization mode of students' individual work

The individual work of students include:

- studying Cisco NetAcademy courses and other information sources,
- repeating hands on labs

Evaluation of study results

Final mark depends on laboratory works, tests and final exam. It is mandatory to pass all laboratory works and tests before exam.

Study course outline

No.	Title of the topic
1	Introduction to computer networks
2	OSI network model

3	TCP/IP model. IP addressing, routing and network protocols.
4	Configuring and troubleshooting network settings in varioous operating systems.

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Embedded Systems

(Iegultās lietojumprogrammas)

Author	Mg. Sc. Ing., lektors, Gints Dreifogels
LAIS code	DatZ2021
Test form	Exam
Credit points (ECTS)	4 (6 ECTS)
Total number of contact lessons	32
Total number of lectures	10
Total number of workshops	22
Required knowledge to start the course	Not needed
Part of study programm	Industry study course

Study course aim

Study goal is to give theoretical and practical knowledge about applications of microcontrollers, including their architecture, technical characteristics, specific properties and programming skills using C and assembly languages. Using specific hardware and firmware development environment, provide possibility to defense their practical works and presenting results of coursework.

Study results

Student successfully mastering the study course:

- can program microcontrollers in C and assembly programming languages
- using specialized hardware and firmware development environment;
- can translate C structures to assembly instructions;
- can work with microcontroller peripheral devices;
- can develop embedded system firmware;
- can defense results of practical works;
- can present results of coursework;
- can characterise microcontroller architecture main buildings blocks.

Student independent work organization type

Student individual work includes:

- regular study of course content, using lecture materials, educational literature, internet resources;
- preparing for lecture tests;
- development of practical work;
- development of coursework.

Evaluation of study results

Final mark depends on:

- Practical works 50%
- Coursework 40%
- Tests 10%

Study course content

No.	Topic
1.	Introduction. Applications of microcontrollers and their architecture. Getting familiar with hardware platform ATmega328P Xplained Mini in usage for practical works.
2.	Basics of digital electronics: • Boolean algebra; • logic gates: NOT, AND, OR, NAND, NOR, XOR, XNOR; • half and full adder, multiplexer, demultiplexer, encoder, decoder; • sequential logic: trigers, registers; • ALU; • practical examples using computer simulation programm Logism.
3.	Microcontroller ATmega328P architecture. Instruction Set. Directives. Getting familiar with Atmel Studio 7 in usage for practical works.
4.	Introduction: Programming basics for microcontroller: • C and assembly programming languages; • Elementary Input and Output Part 1; • practical examples using C and assembly; • macro definitions, bit masks.
5.	Programming basics for microcontroller: • Elementary Input and Output Part 2; • practical examples using C and assembly; • translation from C structures to assembly instructions; • macro definitons, bit masks.
6.	Memory organization. Memory addresing modes. Stack.
7.	Power management and sleep modes. Interrupts.
8.	Peripheral devices: taimers/counters, (watchdog)
9.	Peripheral devices: analog-to-digital converter (ADC)
10.	Peripheral devices: USART, SPI, I2C

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Development Operations Tools

(Rīki programmatūras risinājumu nodrošināšanai)

Author	Mg.sc.comp. Katrina Zvaigzne
Course Code	DatZ2017
Form of evaluation	Test
Credit point (ECTS credit points)	2 (3 ECTS)
Prerequisites	Java
Course group	Industry study course

Objective
The course is a practical introduction to the tools commonly used in the world of DevOps, Software engineering and Continuous Delivery. With a focus on lab-based learning, students will be introduced to, and experience first-hand, the latest advanced engineering techniques which, when applied, can apply a huge benefit to project delivery.

Learning outcomes

- Students have the knowledge about DevOps fundamentals
- Students have the knowledge and practical skills to use the cloud and build environments using industrialized techniques
- Students have the knowledge of core tools, and their roles in continuous delivery and DevOps
- Students have the knowledge and practical skills on how to stand up a working tools environment capable of being used on real clients

Organization mode of students individual assignment
The course consists of contact hours with students and work with literature and internet resources. Contact hours include practical sessions, where students gain the necessary practical skills.

Evaluation of learning outcomes
Final grade is composed of 70% practical assignment grades and 30% of final test. Both must be higher than 4 on a scale of 10.

Course outline

Week	Topic and subtopic	Type **(lecture, seminar, laboratory work)**
1	DevOps fundamentals. Code versioning tools and code repositories. Git. Gerrit. Code versioning, management, Maven	Seminar
2	Cloud services.Amazon Web Services, private clouds, virtual machines/servers.	Seminar
3	Continuous delivery tools. Jenkins	Seminar
4	Code Quality tools. Sonar, Quality gates, integration with other tools and pipelines.	Seminar
5	Configuration Management. Infrastructure automation. Chef, infrastructure building.	Seminar
6	Beyond virtual machines. Containers vs virtual machines, Docker	Seminar
7	Amazon web services and stacks. AWS Cloudformation. Instances. Instance management.	Seminar
8	Operations. Monitoring in cloud. Monitoring tools. ELK (Elacticsearch, logstash, Kibana), Triggers and alarms.	Seminar

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Datu structures and Algorithms (JAVA)

(Data Struktūras un Algoritmi (JAVA))

Author	Mg.sc.comp. Karina Šķirmante
Course Code	DatZ1024
Form of evaluation	Examination
Credit point (ECTS credit points)	2 (ECTS 3)
Prerequisites	Proficiency in JAVA
Course group	Industry study course

Objective

The aim of this course is to provide students with information about fundamental data structures, including worst-case space/time efficiency and implementation details. Relevant algorithms related to the data structures will be covered as appropriate.

Learning outcomes

Upon successful completion of the course, students should

- be able to describe data structures from three perspectives–logical, application, and implementation,
- be able to implement fundamental data structures such as queues, stacks, trees, heaps, graphs.

Organization mode of students individual assignment

Systematic work during semester includes:

- regular learning using lecture materials, literature, internet resources,
- completion of home assignments,
- preparation for tests and the exam,

weekly teacher consultations.

Evaluation of learning outcomes

Final exam consists of two parts:

- theory (30% of total grade)
- programming (70% of total grade)

To be allowed to take the final exam student has to submit all home assignments given during the semester and the average grade for the home assignments has to be at least 4. If the average grade of home assignments is 8 or higher, the student can choose not to write the programming part of the final exam. In this case 70% of total grade is replaced by the average grade of home assignments.

During the semester students have to take two theoretical tests. If the average result of these tests is 8 or higher, the student can choose not to write the theory part of the exam. In this case 30% of total grade is replaced by the average grade for tests.

Course outline

Week	**Topic and subtopic**	**Type** (lecture, seminar, laboratory work)
1.	Concept of data and data type. Data structures and their classification. Commonly used data structures. Arrays. Records. Strings.	Lecture
2.	Lists: operations and implementation.	Seminar
3.-4.	Stack and queue: implementation, operations and application	Lecture, seminar
5.-6.	Linked structures and their operations	Lecture, seminar
7.-8.	Priority queues and heaps: operations, implementation	Lecture, seminar
9.-10.	First test. Trees: terminology, binary trees, binary search trees, operations, full binary tree, balanced tree, tree traversal and implementation.	Test, lecture, seminar
11.-12.	Implementation of binary search tree, copying trees, trees implemented with arrays, expression trees.	Lecture, seminar
13.-14.	Graphs: basics and terminology, implementation, traversals	Lecture, seminar
15.-16.	Second test. Graphs: minimum spanning tree, shortest path algorithms - Dijkstra's algorithm, Bellman–Ford algorithm and others algorithms	Test, lecture, seminar

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Database

(Datu bāzes I un II)

Author	G. Neimanis
Course Code	DatZ1025 and DatZ1026
Form of evaluation	Exam
Credit point (ECTS credit points)	4 (6 ECTS)
Prerequisites	Basic computer skills
Course group	Industry study course

Objective The aim of this course ir to provide knowledge about database management systems, their history, architecture, usability, exploitation as well as to acquire practical skills in creation of databases through practical project.

Learning outcomes Understanding of database types, objects. Skills to normalize data, use SQL for data manipulation and data definition. Understanding and skills to use views, transactions, stored procedures and triggers.

Organization mode of students individual assignment
Regular studies of course material, literature and online resources; homework assignments and development of course project; consultations with lecturer.

Evaluation of learning outcomes
Course project – 50%.
Final exam - 50%;

Course outline

Week	Topic and subtopic	Type (lecture, seminar, laboratory work)

1 - 2	DBMS history, types.	Lecture and seminars
3 - 4	Database design and database objects (tables, relations, keys, indexes).	Lecture and seminars
5 - 6	Data normalization	Lecture and seminars
7 - 8	SQL. DML usage	Lecture and seminars
9 - 10	SQL. DDL and account management commands	Lecture and seminars
11 - 12	Views and transactions. ACID	Lecture and seminars
13 - 14	Stored procedures, triggers	Lecture and seminars
15 - 16	Course project presentations	Seminars

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Business and Economics

(Ekonomika un komercdarbība)

Author:	**M.Soc.Sc. Viesturs Zeps**
Code	Ekon1017
Type of Test:	Exam (including practical assignment)
Credit Points (ECTS):	2 (3 ECTS)
Pre-conditions to participate:	Proficient understanding of English
Group	General education study courses

Aim of the Course

Main aim of the course is to provide knowledge and information to students on creation of modern high tech companies and management of innovation projects. The course enables students to understand key principles of business modelling, experiment and test business related hypothesis, develop their innovation projects (or start-up projects), prepare pitch-decks and present them.

Course covers the main principles of Lean Start-Up, explains the typical business and product development cycles, and provides information on most suitable support incentives and fundraising (venture capital, grant schemes, loans and mixed incentives)

Expected Results of the studies

It is expected that students (individually or in groups) are able to develop their own business model, prepare financial projects of the project (start-up) that is based on real data, prepare and present pitch deck for investors or any other financial scheme.

Organization of individual assignments

Course is organized in lectures and seminars, a set of home reading and some case study analysis are required by students. Individual assignments generally are based on development of the business model as well as ability to present it.

Evaulation of the resuls

Total evaluation of course are combined as follows:

50% Written Assignment

10% Participation in Lectures

40% Presentation of Pitch Deck

Contents of the Course

Week	Subject and Sub-Subject	**Type** (lectures, seminars, individual takss, laboratory activities)
1	Setting up of a company, typical cycles of a company development, general legal aspects on setting up a company. Knowledge, skills, team, funding and other fundamentals to start commercial activities.	Lecture / Seminar (4 lectures)
2	Development of Business Model Canvas (Profile of a company): - Business model Canvas - Analysis of other business models - Fundamentals of Pitch Deck	Lecture / Seminar (4 lectures)
3	Development of Business model canvas - Development and analysis of BM Canvas - Development and analysis of Financial Plan - Analysis of Competition, Segmentation etc	Lecture / Practical Assignment (4 lectures)
4	Fund rising - Development of MVPs - Analysis of costs - Presentations of a Pitch Deck	Seminar (4 lectures)

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Communication and Professional Ethics

(Saskarsme un profesionālā ētika)

Author	doc. Dr. philol. Guntars Dreijers
Course Code	KomZ1005
Form of evaluation	examination
Credit point (ECTS credit points)	2 (3ECTS)
Prerequisites	none
Course group	General education study course

Objective

To provide practical skills in communication and professional ethics needed in the work with customers, colleagues, and people from the academic environment – students and the teaching staff.

Learning outcomes

Students will learn about the basic concepts, models and their applications in communication and professional ethics; they will also be able to explain, analyze the practical applicability of the concepts and the models.

Organization mode of students individual assignment

Learning of concepts,home reading, drawing up and preparing presentations, preparing for the final examination

Evaluation of learning outcomes

Students will be provided with a feedback (oral and written assessment) about acquired concepts in communication and professional ethics, about discussions and negotiations, about oral presentations, and an assessment of the written examination

Course Outline

Week	Topic and subtopic	Type **(lecture, seminar, laboratory work)**
1-2	Components of language in communication. The role of language in communication. Lingustic and extralinguistic components of communication.	1lecture, 1 seminar
3-4	Ethical considerations in communication. The concept of ethics. Communication ethics.	1lecture, 1 seminar
5-6	Psycholinguistic aspects of communication. Personality, character, behaviour in communication.	1lecture, 1 seminar

7-8	Discussion, confrontation. The role of word(s) in a communication. Discussion, confrontatin, objections, pretexts and excuses, manipulation.	1lecture, 1 seminar
9-10	Business negotiations and business relations. Persuasion, influencing, motivation, forming and expressing an opinion.	2 seminars
11-12	Speech. Prepared and ex promptu speech.	1 lecture, 1 seminar
13-14	Attitude, coherence, calibrating. Attitude to speech situation, participants. Congruence skill. Calibrating or the skill to observe and notice differences in human behaviour.	2 seminars
15-16	Oral communication in presentations. Preparing the final term task.	2 seminars

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Fundamentals of the Latvian Language

(Latviešu valodas pamati)

Author	Mg. philol., lecturer Sintija Ozoliņa
LAIS course code	New course
Form of evaluation	Test
Academic credit points (ECTS credit points)	2 (3 ECTS)
The total number of contact lessons	16
The number of lectures	-
The number of practical classes	16
Prerequisites	-
Part of the study programme	General education study courses

Study course objective

The study course objective is to develop written and spoken communication skills in the Latvian language.

Study results

Having acquired the study course, a student:

- Is capable of communicating in the Latvian language with or without a dictionary;
- Is able to introduce others to himself/herself, to use Latvian when shopping and in other daily activities, as well as is able to write simple messages in Latvian and to fill out questionnaires, and is able to form a dialogue.

Organization mode of students' individual work

The independent work of students include:

- a regular learning of the course by using lecture materials, study literature, internet resources,
- homework assignment completion,
- situation interpretations and group work during classes,
- preparations for the tests and exams.

Evaluation of study results

The end result is made of:

- Homework 10%
- Performance in classes 30%
- Exam 60%

Study course outline

No.	Title of the topic
1.	Pronunciation of the sounds in the Latvian language.
2.	Creation and building of vocabulary.
3.	Nouns and their categories.
4.	Numerals and their categories.
5.	Pronouns and their categories.
6.	Verbs and their categories.

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Academic Writing

(Akadēmiskā angļu rakstu valoda)

Author	Dr.philol., Assist. Prof. Jānis Veckrācis
LAIS course code	Valo3027
Form of evaluation	Test
Academic credit points (ECTS credit points)	2 (3 ECTS)
The total number of contact lessons	16
The number of lectures	-
The number of practical classes	13
Prerequisites .	Competence in academic writing acquired in previous study courses
Part of the study programme	General education study courses

Study course objective

The aim of the course is to provide insight into the standards and features of academic writing in order to ensure that students are able to use this knowledge effectively and at high quality in the preparation and presentation of their Bachelor Paper and other scientific studies, also by developing the overall level of competence in line with the standards of the profession to be acquired and the needs of the labour market.

Study results

Having acquired the study course, a student:

- is capable of practical and independent use of acquired knowledge and skills of academic written English in the preparation and presentation of their Bachelor Paper and other scientific studies at a high level of competence;
- is able to meet the relevant requirements pertaining to style, content, design and presentation;
- is capable of meeting the ethical standards of academic writing.

Organization mode of students' individual work

The independent work of students includes:

- engagement in the course on a regular basis by using of study materials, study literature, Internet resources;
- completion of home assignments;
- preparation for the final test.

Evaluation of study results

The end result is made of:

- Home assignments 20%;
- Class work 20%;

- Final test 60%.

Study course outline

No.	Title of the topic
1.	Introduction. Types of scientific articles. Basic principles of academic writing language practice. Phases of developing/drafting of Bachelor Paper (BP).
2.	Phase 1: research problem and topic.
3.	Phase 2: study plan (table of contents).
4.	Phase 3. Part I. Use of references. Quotations and their integration into a text
5.	Phase 4. Part II. Case study; practical analysis.
6.	Phase 5: Conclusions.
7.	Phase 6: Introductions and abstract.
8.	Phase 7: Bibliography and proofreading.
9.	Research methods.

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Business English I

(Uzņēmējdarbības valoda I: menedžments un darba tirgus)

Author	j.doc. Thomas Springer
LAIS course code	SDSK2007
Form of evaluation	Test
Academic credit points (ECTS credit points)	2 (3 ECTS)
The total number of contact lessons	8
The number of lectures	8
The number of practical classes	0
Prerequisites	Upper Intermediate English Proficiency
Part of the study programme	Basic theoretical courses in the field and IT courses

Study course objective

The study course objective is to improve English language skills, with a focus on professional vocabulary and business topics. Attention is directed in how to take part in meetings and discussions, use appropriate language and tone in professional and other business communications, and effectively understand the basic business forces that influence business decisions.

Study results

Having acquired the study course, a student:

- Is capable of understanding and discussing current business topics in the news.
- Is able to define and explain basic business terms.
- Is able to distinguish between the Macro and Micro economic principles and their influence on business.

Organization mode of students' individual work

The independent work of students includes:

- a regular learning of the course by using lecture materials, study literature, internet resources,
- homework assignment completion,
- preparations for the tests.

Evaluation of study results

The independent work of students include:

1. a regular learning of the course by using lecture materials, study literature, internet resources,
2. homework assignment completion,
3. preparations for the tests.

Study course outline

No.	Title of the topic
1.	Contracts
2.	Business Terms and Vocabulary
3.	Macro and Micro Economic Terms
4.	Business Entities
5.	Basics of Financing

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Research Methods

(Pētījumu metodes)

Author	Assistant Professor Dr. sc. administr. Liene Resele
LAIS course code	Citi5001
Form of evaluation	Exam
Academic credit points (ECTS credit points)	2 (3 ECTS)
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	Statistics, Econometrics
Part of the study programme	Comprehensive study course

Study course objective

To acquire knowledge about scientific research process, social science research problems, methods, research process, its stages, results, their reflection. To develop students' skills in the preparation, implementation and presentation of research work (including – course, bachelor's and master's thesis).

Study results

Having acquired the study course, a student:

- is able to read and analyse research literature, documents and statistical data;
- has knowledge about the essence, basic concepts and process of scientific research;
- is able to formulate the key elements of research and select appropriate research methods;
- is able to collect and process qualitative and quantitative data and interpret the results;
- is able to write and present research report.

Organization mode of students' individual work

The independent work of student includes:

- a regular learning of the course by using lecture materials, study literature, internet resources;
- fulfilling assignments in practical classes;
- preparation for the exam.

Evaluation of study results

The end result is made of:

- work in the lectures and practical classes – 60%;
- exam – 40%.

Study course outline

No.	Title of the topic
1.	Characteristics of the scientific research
2.	Research elements. Formulating and clarifying the research topic
3.	Bibliographic references and literature review
4.	Selecting samples
5.	Obtaining and using primary and secondary data
6.	Analysis of quantitative and qualitative data
7.	Writing and presenting a research report

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Information and Business Processes

(Informācijas un biznesa procesi)

Author	Asoc. professor, rector Kārlis Krēsliņš
LAIS course code	VadZ3036
Form of evaluation	Exam
Academic credit points (ECTS credit points)	4 (6 ECTS)
The total number of contact lessons	32
The number of lectures	27
The number of practical classes	5
Prerequisites	Basic knowledge in business management, marketing and information technology is needed.
Part of the study programme	General education study courses

Study course objective

The study course objective is to provide students understanding about such concepts as new economics, information society, e-commerce, e-business, e-marketing as well as to familiarise students with business models, its specifics and kinds of use. The study course objective is also to give students overview about use of modern technology (e-environment) in business in order to develop business processes and increase business efficiency.

Study results

Having acquired the study course, a student:

- Is capable to discuss about the theoretical aspects of business processes as well as is able to analyse practical usage of business models.
- Is able to determine and analyse different problem situations.
- Is capable to analyse definite business activities and environment and is able to draw independent conclusions about use of e-business models in the business operations.
- Is able independently to find relevant information about the concrete issue, is able to analyse this information and present to others.

Organization mode of students' individual work

The independent work of students includes:

- a regular learning of the course by using lecture materials, study literature, internet resources,
- homework assignment completion,
- preparations for the tests and exams.

Evaluation of study results

The end result is made of:

- Tests 30%
- Performance in classes 10%
- Exam 60%

Study course outline

No.	Title of the topic
1.	Description of the course, structure and definitions.
2.	Management of information technology.
3.	Use of IT in business.
4.	Emergence of e-commerce and e-business.
5.	Development of internet and e-commerce.
6.	Strategy and development of information systems.
7.	Management of information systems.
8.	Business processes and analysis of business processes.
9.	Change management.
10.	Management of corporate information resources.
11.	Role of information systems in knowledge management and decision making.
12.	Data and information security and protection.
13.	Social and ethical problems and its relation to information systems.
14.	New economics and its characteristics.
15.	Role of innovation in development of economic processes.
16.	Course summary and conclusions.

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Organisational Behavior

(Organizāciju uzvedība)

Author	Mag. Līga Koloda, lecturer
LAIS course code	Citi3030
Form of evaluation	Exam
Academic credit points (ECTS credit points)	2 (3 ECTS)
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	Knowledge in management theory and entrepreneurship.
Part of the study programme	General education study courses

Study course objective

The study course objective is to provide the students understanding of the organizational structure, elaborate on the work in the teams, work environment and role of the leader in the team as well as change management theory and cases.

Study results

Having acquired the study course, a student:

- Is capable of understanding organizational structure, motivation system and knows the theory and good practice examples on change management
- Is able to define the roles of the individuals developing and implementing the changes in the organisation and develop the individual approaches.

Organization mode of students' individual work

The independent work of students includes:

- a regular learning of the course by using lecture materials, study literature, internet resources,
- homework,
- writing a course paper,
- preparation for the exam.

Evaluation of study results

The end result is made of:

- Performance in class 40%
- Exam 60%

Study course outline

No.	Title of the topic

1.	Organisational behaviour introduction.
2.	Globalisation, high performance organisations and diversity of workforce.
3.	Work in the teams, perceptions and attributions, behaviour of the groups.
4.	Motivation and job design.
5.	Performance appraisal.
6.	Leadership, power and empowerment.
7.	Organisational communication.
8.	Decision making process.
9.	Conflict and negotiations.
10.	Organisational change.
11.	Organisational design and strategy.
12.	Organisational culture and corporate social responsibility.

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Macroeconomics

(Makroekonomika)

Author	Dr.oec., viesprof. Ivars Brīvers
LAIS course code	Ekon1015
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 (4.5 ECTS)
The total number of contact lessons	-
The number of lectures	-
The number of practical classes	-
Prerequisites	Mathematics, Microeconomics
Part of the study programme	General education study courses

Study course objective

Course objective: to provide students with an understanding of economic objectives at the macro level, of economic processes, the performance indicators, and the relationship between them, on the ways and means to affect these processes.

Study results

- Able to demonstrate knowledge of the subject matter and macro-economic objectives of macroeconomic skills, to evaluate the commitment to the objectives at the micro level, is able to understand the fundamental economic and alternative directions for their solution.
- Able to demonstrate knowledge of key macroeconomic indicators and their interrelationships, ability to assess the macro-economic situation, selecting the relevant indicators are able to find and evaluate the macroeconomic indicators of the sources of information or their relationship.
- Able to demonstrate knowledge of the economic policy instruments, the ability to evaluate the use and efficacy are able to understand the economic interrelationships between policy instruments.
- Able to demonstrate skills to analyze the national economy, to assess the possible state intervention in the economy and predict its consequences.

Organization mode of students' individual work

Test

After considering first three items there will be a written test. Positive evaluation for the test is a necessary condition for examination.

Examination

The examination students will be in a written form of test, covering topics presented in lectures and including essay type questions. It will be open notes, open mind, closed laptops, closed phones and no sharing of notes or anything else. Answers will be graded on organization and relevancy as well. This means points will be deducted for any irrelevant material in the answer. As an optional extra task students are offered to prepare (in a form of an essay) the following: how do you understand the main goal of economy in the formulation of the United Nations Organization?

Evaluation of study results

The end result is made of:

- active participation during the classes and individual work assessment – 30%
- test – 30%
- written exam – 40%

Study course outline

1.Introduction to Macroeconomics
1.1.The goal of economy in the 1987 formulation of United Nations Organization
1.2.The subject and history of Macroeconomics
2.The key macroeconomic processes, indicators and their interrelation
2.1. Basic macroeconomic indicators
2.2. Economic growth
2.3. The average standard of living
2.4. Inflation
2.5. Unemployment
3.Structure of the economy
3.1. Sectoral structure of economy
3.2. Social structure of economy
4.Basic concepts of economic policy
4.1. Business cycles
4.2. Aggregate supply and aggregate demand
4.3. Main tools of economic policy
4.4. Expansive and restrictive economic policy
5.Fiscal policy
5.1. Basic principles of taxation
5.2. The simplest Keynesian multiplier model
6.Monetary policy
6.1. The concept of money
6.2. Money supply
6.3. How commercial banks create money
6.4. Demand in the money market
7.Interconnection between goods and money markets: IS-LM model 8.XXI century – a birth of new paradigm in economy?

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The English Language: Communication Aspects II

(Angļu valoda: komunikācijas prasmes II)

Author	Professional master's degree in legal text translation, vieslekt. Valērijs Sergejevs
LAIS course code	KomZ1004
Form of evaluation	Exam
Academic credit points (ECTS credit points)	4 (6 ECTS)
The total number of contact lessons	32
The number of lectures	-
The number of practical classes	-
Prerequisites	None
Part of the study programme	General education study courses

Study course objective

- To improve reading and comprehension skills
- To improve knowledge of English grammar
- To get acquainted with various text types
- To practice text skimming skills in order to pinpoint the prevailing topic and key ideas
- To practice text analysis and discussion of topics present in the text
- To improve the skills of summarizing and note-taking
- To expand essential business-related and communication-related vocabulary
- To improve communication skills, both in writing and in spoken English

Organization mode of students' individual assignment

Students are required to participate in in-class activities (compulsory attendance, minimum of 75 %), as well as fulfil home assignments

Organization mode of students' individual work

The independent work of students includes:

- a regular learning of the course by using lecture materials, study literature, internet resources,
- homework,
- writing a course paper,
- preparation for the exam.

Evaluation of study results

The end result is made of:

- Home assignments/ in-class assignments
- Midterm test Final exam

Study course outline

No.	Title of the topic

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Introduction to Computer Studies

(Ievads datormācībā)

Author	Ester Vītola
LAIS course code	DziT1014
Form of evaluation	Exam
Academic credit points (ECTS credit points)	2 (3 ECTS)
The total number of contact lessons	16
The number of lectures	-
The number of practical classes	-
Prerequisites	-
Part of the study programme	General education study courses

Study course objective

To help students learn the specifics of VeUAS computer network. Acquire the knowledge of changing computer settings, use and configure operating systems installed on VUC computers. Acquire the skills to work with office software and practice typing skills.

Organization mode of students individual assignment

Regular learning using lecture materials, internet resources, software help systems. Individual assignment completion. Weekly teacher consultations.

Learning Outcomes

Students are able to operate independently the VeUAS computer network resources from both publicly available and personal computers.
Students are able to use e-mail, printing devices and office software. Students are able to write bachelor paper in accordance with the methodological instructions of the faculty; use spreadsheets.

Evaluation of study results

All students are allowed to write the final test.
Prerequisites for automatic pass:

- student during the semester has not skipped more than three classes;
- a certain amount of points obtained in MS Word and MS Excel tests;
- submitted class work is evaluated as mostly good.

Study course outline

1. User authentication, account activation in all environments, adding printer. Authorization in the e-mail account. Accessing VUC network resources from other networks. Learning to work with WinSCP.
2. Internet browsers, their settings and saving data. Adding data to archive.
3. Internet resources and organization. Adding links to bookmarks and organizing them. Bookmark export, import.

4. Searching online resources. Specialized search engines, machine translation options, booking tickets online, satellite maps, etc.
5. Working with Google documents, file sharing. Creating Google survey and mailing it to respondents, Google presentations.
6. Working in Linux. Adding a keyboard language, accessing network folders and their files with different network protocols (SMB, SFTP, fish).
7.Formatting documents in MS Office and OpenOffice: formatting paragraph, creating and formatting tables, using multi-level numbering, creating automatic table of contents, working with track changes, creating and using templates, creating a series of documents.
8. MS Word test in Moodle.
9. Working with MS Excel: data entry, formatting and printing parameters, Excel formulas, functions and their application. Absolute, relative and mixed references. Array formulas, data sorting.
10. MS Excel test in Moodle.
11. At the beginning of each class, students train their typing skills with Typing Master.

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Intercultural Aspects of the Latvian Language

(Latviešu valodas starpkultūru aspekti)

Author	Mg.philol., lecturer Sintija Ozoliņa
LAIS course code	
Form of evaluation	Test
Academic credit points (ECTS credit points)	
The total number of contact lessons	16
The number of lectures	-
The number of practical classes	16
Prerequisites	-
Part of the study programme	General education study courses

Study course objective

The study course objective is to develop communication skills in the Latvian language.

Study results

Having acquired the study course, a student:

- Is capable of communicating in the Latvian language with or without a dictionary or additional resources;
- Is able to introduce others to himself/herself, to use Latvian when shopping and in other daily activities, as well as is able to write simple messages in Latvian and to fill out questionnaires, and is able to form a dialogue.

Organization mode of students' individual work

The independent work of students include:

- a regular learning of the course by using lecture materials, study literature, internet resources,
- homework assignment completion,
- situation interpretations and group work during classes,
- preparations for the tests and exams.

Evaluation of study results

The end result is made of:

- Homework 10%
- Performance in classes 30%
- Exam 60%

Study course outline

No.	Title of the topic
1.	Pronunciation of the sounds in the Latvian language.
2.	Creation and building of vocabulary.
3.	Nouns and their categories.
4.	Numerals and their categories.
5.	Pronouns and their categories.
6.	Verbs and their categories.

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Management Theories

(Vadības teorija)

Author	MBA, lecturer Dace Štefenberga
LAIS code	VadZ 5001
Form of testing	Exam
Credit Points (ECTS)	2 CP (3 ECTS)
Total number of contact hours	16
Number of lectures	8
Number of practical lessons	8
Knowledge necessary to undertake the course	Basic knowledge in economics
Part of the study programme	Restricted elective

Goal of the course

The goal of the course is to get acquainted with management theories and their development, to develop and promote creative thinking and action in management situation assessment and decision-making.

Study results

After the completion of the course, a student:

- Acquainted with management theories.
- Knows how to apply and choose the most appropriate structure in practical business.

Type of organization for student individual assignments

Self-study by students (60%) includes:

- Regular study of the course contents using the Moodle platform, study materials, educational literature and Internet resources;
- Case study analysis and presentation.

Evaluation of study results

Final evaluation of the study performance consists of:

- Case study analysis presentation — 40%
- Exam — 60%

Contents of the study course

No.	Topic
1.	Basic concepts of management. Introduction to management theories.
2.	Basic context of management. Historical background. Management and the economy.

No.	Topic
3.	F. Taylor's Scientific Management Theory. H. Fayol's Administrative Management Theory. Scientific theories and business economics. Objectives of the management process.
4.	M. Weber's Bureaucratic Management Theory. E. Mayo's Human Relations Theory. L. von Bertalanffy's General System Theory. D. McGregor's Theory X and Theory Y. Functions of the management process.
5.	P. Drucker's Management Theory. Levels of management. Management skills. Context of the management environment
6.	M. Porter's Strategic Management Theory. Innovation management: 6 foundational management competences. Planning and decision-making
7.	Modern management theories — Systemic approach, Quantitative approach, Total quality management, Learning organization approach. Organizing process in management
8.	Modern management theories — Team building theory, Chaos theory, Open system theory, Contingency theory, Theory U, leadership in management

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International Business Law

(Starptautiskās komerctiesības)

Author	Doctorate, Guest Professor, Thomas Springer
LAIS course code	JurZ2005
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	12
The number of practical classes	4
Prerequisites	Intermediate English Level
Part of the study programme	General education study courses

Study course objective

The study course objective is:

- to identify the source of international laws;
- to determine the risks of international business and an examination of how these risks differ from doing business domestically;
- to identify the transactional risk associated with importing and exporting;
- to understand foreign Licensing, Franchising and Intellectual Property Law;
- to identify the political risk inherent in foreign direct investment;
- to provide an understanding of the differences between principles and rules;

Study results

Having acquired the study course, a student is:

- able to provide definitions and explanations of the basic concepts included in the course;
- capable of identifying which laws apply to international business transactions;
- able to identify proper Venue to settle disputes;
- able to explain the basic clauses of international contracts;
- capable of drafting a basic service and goods contract;
- able to participate and conduct a cross border contract negotiation;

Organization mode of students' individual work

The independent work of students includes:

- a regular learning of the course by using lecture materials, study literature, internet resources;
- homework assignment completion;
- in-class practical assignments;
- preparations for the tests and exams.

Evaluation of study results

The end result is made of:

- participation 30%
- performance of in-class work 10%
- midterm exam 25%
- final exam – 35%

Study course outline

No.	Title of the topic
1.	Source of International Law
2.	International Contracts
3.	Dispute Resolution
4.	Negotiations

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Business Ethics

(Pārvaldības ētika)

Author	Doctorate, Guest Professor, Thomas Springer
LAIS course code	Filz3001
Form of evaluation	Exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	10
The number of practical classes	6
Prerequisites	Intermediate English Level
Part of the study programme	General education study courses

Study course objective

The study course objective is:

- to define, describe and contrast the role of personal ethics from business ethics;
- to provide an understanding of the differences between principles and rules;
- to differentiate between Best Practices and obligatory ethical laws;
- to provide a working knowledge of the theories and roles of Shareholders and Stakeholders influence on an organization's ethical philosophy;
- to provide a working knowledge of the process of creating an ethical philosophy in an organization by the HR department and senior management;
- to provide a working knowledge of the process of Dispute Resolution using ethical principles.

Study results

Having acquired the study course, a student is:

- able to provide definitions and explanations of the basic concepts included in the course;
- capable of identifying ethical issues within an organization;
- able to explain the rules in an organization in relation to its ethical principles;
- capable of drafting a basic set of rules based on ethical principles
- able to participate and conduct a dispute resolution conflict discussion using a principle-based approach.

Organization mode of students' individual work

The independent work of students includes:

- a regular learning of the course by using lecture materials, study literature, internet resources;
- homework assignment completion;
- in-class practical assignments;

- preparations for the tests and exams.

Evaluation of study results

The end result is made of:

- participation 30%
- performance of in-class work 10%
- midterm exam 25%
- final exam – 35%

Study course outline

No.	Title of the topic
1.	Defining Ethics and identifying ethical dilemmas
2.	Influences on a business's ethical choices
3.	Sources of ethical rules
4.	Ethics within conflicts
5.	Conflict Resolution

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Aspects of Intercultural Communication II

(Starpkultūru komunikācijas aspekti II)

Author	Dr.paed., MBA, assist.prof. Vita Balama
LAIS course code	SDSK1014
Form of evaluation	Exam
Academic credit points (ECTS credit points)	2 credit points (3 ECTS)
The total number of contact lessons	16
The number of lectures	9
The number of practical classes	7
Prerequisites	Intermediate knowledge of English- minimum B2 level (course language of instruction is English)
Part of the study programme	General education study courses

Study course objective

The study course objective is to provide insight into problems of intercultural communication, develop intercultural communication skills (openness, tolerance, adaptability).

Study results

Having acquired the study course, a student:

- is able to present knowledge of intercultural communication,
- has ability to critically analyze data related to this field.

Organization mode of students' individual work

The independent work of students include:

- a regular learning of the course by using lecture materials, study literature, internet resources,
- course paper development on chosen research topic,
- presentation of the research topic,
- preparations for the exam.

Evaluation of study results

The end result is made of:

- Course paper 20%
- Research topic presentation 10%
- Exam 70%

Study course outline

No.	Title of the topic
1.	Intercultural communication for an individual. Concept of communication. Interaction or communication.
2.	Psychological aspects of intercultural communication (awareness of one’s identity, acceptance/non-acceptance of other identity).
3.	Communication with game elements.
4.	Extralinguistic aspects.
5.	Linguistic aspects of intercultural communication.
6.	Language and culture. Cultural and linguistic interference in modern world.
7.	One concept, different cultures.
8.	Facts, pictures, words, objects, colors, different cultures.
9.	Intercultural aspects of communication in modern art.
10.	Translation and intercultural communication.
11.	Individual experience of intercultural communication.

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Financial Economics

(Finanšu ekonomika)

Author	Professor Sergejs Hilkevics
LAIS course code	Ekon2017
Form of evaluation	Test, exam
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	8
The number of practical classes	8
Prerequisites	Study course in Economics
Part of the study program	General education study courses

Study course objective

The study course objectives are to acquire students with latest theories in financial economics, which can be used considering relations between company financial ratios and economic processes, and to develop business thinking and students' ability to manage company.

Study results

After completion of the course students will have fundamental knowledge in financial analysis and it's applications to business administration, including capital budgeting, project evaluation, corporate investment and financing decisions, and basic security analysis and investment management.

Organization mode of students' individual work

The course is lecture and practical exercises based. Lectures will consist of covering the theory, examples, and class discussion. Homework assignments will focus on applying the material from lectures.

The independent work of students include:

- a regular learning of the course by using lecture materials, study literature, internet resources,
- homework assignment completion,
- course paper development,
- preparations for the tests and exams.

Evaluation of study results

The end result is made of:

- Laboratory works 30%
- Performance in classes 10%

- Exam 60%

Study course outline

No.	Title of the topic
1.	Economic processes descriptions – macroeconomics, microeconomics, econometrics. Economic growth, economic equilibrium, economic cycles.
2.	Financial economics and financial information. State finances. Company finances. Financial statements – balance sheet, profit-loss account, cash flow.
3.	Three levels of company finances analysis – operational level, financial level, market value level.
4.	Operational level ratios – activity, profits, returns.
5.	Financial level ratios – liquidity, capital structure, leverage.
6.	Market level ratios – time value of money, cash flow present value, terminal value, total present value, shareholder value added, economic value added.
7.	Financial instruments. Financial markets. Risk and return. Market efficiency.
8.	Economic forecasting. Technical analysis. Fundamental analysis. Investment decisions.

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Data transmission technology and devices

Study Course Code	ETeh3001
Credits	4
European Credit Transfer and Accumulation System Credits	6
Total Number of Contact Hours	

Compulsory reading

1. Rappaport, Theodore S. Wireless Communications : principles and practice / Theodore S.Rappaport. - 2nd ed. - Upper Saddle River : Prentice Hall, 2002. - 707 p. ISBN 0130422320. (Ventspils Augstskolas bibliotēkā pieejami 2 eksemplāri)
2. „Wireless Communications and Networks", William Stallings. Prentice Hall, 2001.

Further Reading List

1. „Fundamentals of Wireless LANs: Companion Guide (Cisco Networking Academy Program)", Inc. Cisco Systems, Cisco Networking Academy Program.

Other sources

.http://wi-fi.org/, http://www.fcc.gov/, http://www.ietf.org/, http://www.itu.int/, http://www.etsi.org/, http://www.ieee.org/

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Lexicostylistic English Text Analysis: Theory and Application

Author	MA Ieva Vizule
LAIS course code	Valo1012
Form of evaluation	Term test
Academic credit points (ECTS credit points)	3 ECTS
The total number of contact lessons	16
The number of lectures	3
The number of practical classes	13
Prerequisites	Good knowledge of English
Part of the study programme	Basic theoretical and IT courses

Course objective

To enhance student understanding of what a text is and develop their skill and ability to see the text, its author and their message through different linguistic and stylistic textual elements; and to expand the student vocabulary (word building, synonymy, polysemy, idiomatic expressions, etc.)

Study results

At the end of the course the student is able to:

- critically read and understand relevant theoretical materials and the basic concepts they contain;
- demonstrate different text reading techniques and ability to understand the text sender's message and intention;
- to perform a comprehensive linguistic and stylistic text analysis (macro and micro level, identifying relevant contexts, text type, pragmatics, register, key ideas and words, target audience, figures of speech and their function, etc.), individually and/ or in a group;
- analyse lexical units in the text in terms of their morphology, semantics (micro/macro meaning, incl. *US/ UK/ AUS English*, polysemy, homonymy, synonymy, connotations, phraseology), and style (direct and figurative meaning);
- demonstrate their ability to choose relevant reference sources and to successfully use them in substantiating their point of view;
- demonstrate their ability to integrtae newly acquired vocabulary in their own writing

Organization mode of student individual work

The work is organised through the *Moodle* platform during the classes and outside them, and it involves various group and individual class and home assignments:

- reading theoretical materials/ watching video lectures, and taking notes;
- reading and comprehending different expressive texts (focused on a certain

textual aspect, or comprehensive);

- doing a detailed analysis of a text (linguistic and stylistic)
- vocabulary analysis and acquisition (separate word polysemy, synonym lines)
- writing assignments (vocabulary integrattion in some creative writing/ comments demonstrating student understanding of the discussed theory)
- work with different reference sources

Evaluation of study results

A 2-part term test: text analysis (accounts for 60% of the overall final grade), and vocabulary and language use (40%). Successful from 60%.
During the term:

- completiton of the home assignments (either submitted or presented in the calss)
- engagement in the class work
- class tests (successful from 70%)

Study course outline

No.	Title of the topic
1	Text and text analysis for translating. Text types.
2	Text analysis and basic concepts: text types, genres, plot lines, tone in writing, register, pragmatics, figures of speech, word formation.
3	Text and its components: vocabulary and syntax (word classes, word formation, collocations, synonymy, polysemy, sentences & their structure, micro and macro meaning of vocabulary units).
4	Micro and macro analysis of the text (relevant contexts and how they help in text perception; pragmatic goal of the text and its linguistic realisation)
5	Vocabulary acquisition; language use in the texts, including created by students.

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English Written Practice I

Author	MA Ieva Vizule
LAIS course code	Valo2006
Form of evaluation	Term Test
Academic credit points (ECTS credit points)	1.5 ECTS
The total number of contact lessons	8
The number of lectures	-
The number of practical classes	8
Prerequisites	English Grammar I & II; Communication in English I & II; Linguistic and Stylistic Text Analysis I & II; Text Formating and Editing (LV)
Part of the study programme	General education courses

Course objective

To develop student cognitive skills through acquiring the main text creation principles, elements and norms on the word, sentence and text level, including against those in the native language.

Study results

At the end of the course, the student is able to:

- Critically read and understand theoretical literature on text production in English, and summarise the key points orally or in writing in group or individually;
- See and explain how spelling, punctuation and text creation conventions in English differ from those in their native language, and explain their effect on the meaning on the word, sentence and text level;
- Demonstrate their understanding and skill of creating texts that have different communicative purpose and register through their ability to choose appropriate linguistic tools and use them in their writing;
- Express their idea in a well-structured, logical, clear and concise manner avoiding wordiness, unjustified and irrelevant textual entries;
- Review and peer-review a written piece and evaluate how it complies with the accepted conventions in writing as well as with the assessment criteria;
- Find and use relevant reference sources and computer supported writing tools at different stages of their writing.

Organization mode of student individual work

Each 90-min class every other week - within the *Moodle* platform - followed by individual home assignments:

- home assignments completed and submitted (written assignment after a week, punctuation, spelling – for the next class)

- class assignments completed and submitted, engagement in class discussions (reviewing and revising written pieces in the light of theoretical material)
- reflective writing on the completed assignments
- class tests on punctuation and spelling

Evaluation of study results

A 4-part WRITTEN TEST (pass/fail)*:*

- Spelling I: rules-based (electronically);
- Spelling II: confusing words (electronically);
- Punctuation (electronically), and
- Paragraph writing (by hand, without using any reference sources).

A pass from 70%; spelling – from 80%

Study course outline

No.	Title of the topic
1	Text creating and how it develops cognitive skills; text creating and its main elements
2	Text and its main elements: punctuation, spelling, sentence combining.
3	Text and its main elements: structure and cohesion; the topic sentence
4	Paragraph/ text types and the text pragmatics: argumentation, cause and effect, contrasts and comparison
5	Text creating, editing and revising

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