DESCRIPTION OF COURSE

University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KÚA FHI/IIE22410/22	**Title of course:** Accounting and financial reporting of Insurance Companies

Type, load and method of teaching activities: **Form of course:** Lecture / Practical **Recommended load of course (number of lessons):** **Per week:** 2 / 2 **Per course:** 26 / 26 **Method of study:** present

Number of credits: 5

Recommended semester/trimester of study: 2.

Degree of study: II.

Prerequisites:

Requirements to complete the course: 15 % written work, 10 % semester seminar work, resp. project, 5 % continuous processing of tasks, worksheets resp. case studies. 70 % written exam.

Student workload: Total study load (in hours): 130 hours 26 hours of lectures, 26 hours of exercise, 48 hours of self-study in preparation for the exam, 10 hours preparation for seminars, 10 hours elaboration of a semester project, 10 hours preparation for written work.

Teaching results: Teaching results: Completion of the course will bring students the expansion of key competencies in the field of new knowledge and skills related to the actuarial profession. The student will gain an overview of the functioning of the European system of financial supervision and important EU legislation, the system of risk management and administration with emphasis on the roles and functions of the actuarial profession. The student will acquire knowledge in the field of internal audit and regulatory measures of the NBS and will get acquainted with the international standard IFRS 17 Insurance Contracts. The student will gain knowledge about the requirements for the system of administration and management of assets, technical provisions and equity applied under the new regulatory regime under the Solvency II Directive. Knowledge and understanding The graduate of the course will gain an overview of the current national and supranational legislation of accounting and financial reporting of insurance companies. They will acquire knowledge about the performance of insurance, reinsurance and investment activities of insurance companies. They will learn to account for and report this information in the financial statements prepared in accordance with International Financial Reporting Standards (IFRS). He knows the tools and techniques of managing individual risks to which the insurance company is exposed, including

the reporting of mandatory disclosure of risks in financial reports. They will learn to interpret information from accounting into financial reports for the needs of the NBS, investors and other users.
Competence
The student solves assigned tasks and accounts for practical examples from the practice of commercial insurance companies. It controls the requirements for reporting information in the financial statements prepared in accordance with IFRS and orients other statements, reports and reports submitted to the NBS. Gains the basics of critical thinking in solving case studies and can assess the requirements for information presented by the user.
Skills
Students will acquire the necessary skills to enable them to perform executive and managerial tasks related to the actuarial profession in a commercial insurance company. They will learn to interpret information from accounting into financial reports published for the needs of the NBS, investors and other users.

Indicative content:
The role of insurance companies in a globalized economy. Legislative and regulatory framework of insurance accounting and reporting. Presentation of information in the financial statements of an insurance company. Insurance contract and investment contract. Settlement relationships from direct insurance. Co-insurance. Other settlement relations of the insurance company. Financial placement in real estate. Financial placement in financial assets. Intangible, tangible movable property, other property. Equity structure and reporting. Technical provisions. Other long - term liabilities of the insurance company. Dividing, accounting and reporting of insurance costs and revenues

Support literature:
1. Meluchova, J.: Účtovníctvo a výkazníctvo poisťovní podľa IFRS a Solventnosti II, 1. vydanie, vydavateľstvo WK, 2019;
2. Meluchova, J.: Účtovníctvo a vykazovanie poisťovní podľa IFRS, cvičebnica, vydavateľstvo EKONÓM 2017;
3. Act no. 39/2015 Z. z. o poisťovníctve a o zmene a doplnení niektorých zákonov v znení neskorších predpisov.
4. Dvořáková, D.: Finanční účetnictví a výkaznictví podle mezinárodních účetních standardů IFRS, 5. aktualizované a rozšířené vydání, 2017.
5. IFRS: http://eur-lex.europa.eu/legal-content/SK/TXT/HTML/?uri=CELEX:02008R1126-20160101&qid=1505458350655&from=EN a doplnky z r. 2019 a 2020.
6. EU legal acts for the insurance sector (EU directives, EC regulations, EIOPA measures).
7. Measures, guidelines, recommendations and other NBS documents for the insurance sector.

Syllabus:
Sylabus:
1. Legislative framework for the regulation of accounting and financial reporting of insurance companies in the Slovak Republic and the EU, legislative and regulatory framework for investment management and the securities market with emphasis on the roles and functions of the actuar in the insurance company.
2. Regulatory requirements and the system of operation of the insurance sector in the EU (Solvency II Directive) and related requirements for the reporting of this information in the financial statements of insurance companies.
3. Principles and principles of accounting, basic assumptions of preparation of financial statements, goal and characteristics of individual components of financial statements of an insurance company prepared in accordance with IFRS.

4. Characteristics and basic requirements imposed on the content structure of financial reports prepared by insurance companies (statements, reports and reports submitted to the NBS, audited financial statements). Annual report of the insurance company from the point of view of both the creator and the user.
5. Basic principles of accounting and taxation of the insurance company, methods of investment and taxation of investment income. Profit or loss of the insurance company.
6. Insurance contract according to the international standard IFRS 4 (IFRS 17) present and future.
7. Settlement relationships with clients, intermediaries and reinsurers arising from insurance and reinsurance activities. Other, settlement relations.
8. Financial instruments issued or procured by an insurance company (investment opportunities and methods of valuing financial instruments, disclosure requirements for risks associated with the investment strategy). Methods and techniques of valuing assets and liabilities.
9. Capital structure (equity) of the insurance company and its dividend policy. Requirements for proving solvency (Solvency II Directive).
10. Structure of financial liabilities, testing the adequacy of provisions created to cover liabilities from insurance and investment contracts. Insurance liabilities in the form of embedded options and guarantees in life insurance, embedded derivative in the insurance contract.
11. Tools and methods used to value, monitor and eliminate the risks to which the insurance undertaking is exposed. Significant risk analysis, risk concentration and risk underwriting strategy. Application of the principles of the ALM system for the needs of ensuring the time consistency of cash flows arising from assets to cover due and expected liabilities from concluded contracts.
12. Costs and revenues arising from insurance, reinsurance and other activities of the insurance company. Structure of profit or loss and presentation of this information in the financial statements.
13. Calculation and use of financial indicators, analysis of the financial situation of the insurance company or group (including intra-group transactions).

Language whose command is required to complete the course:
slovak

Notes:

Assessment of courses
Total number of evaluated students: 112

A	B	C	D	E	FX
14.29	29.46	35.71	11.61	8.93	0.0

Lecturer: doc. Ing. Jitka Meluchová, PhD.

Date of the latest change: 06.04.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KÚA FHI/IIE21183/21	Title of course: Accounting and taxes of legal entities II

Type, load and method of teaching activities: Form of course: Lecture / Practical Recommended load of course (number of lessons): Per week: 2 / 2 Per course: 26 / 26 Method of study: present

Number of credits: 6

Recommended semester/trimester of study: 3.

Degree of study: II.

Prerequisites:

Requirements to complete the course: 26 hours of lectures 26 hours of seminars 13 hours of preparation for the lectures 26 hours of preparation for the seminars 24 hours of preparation for the continuous written essay (40 % of the overall grading) 41 hours of preparation for the final written exam (60 % of the overall grading) Total study load (in hours): 156

Student workload: 26 hours of lectures 26 hours of seminars 13 hours of preparation for the lectures 26 hours of preparation for the seminars 24 hours of preparation for the continuous written essay (40 % of the overall grading) 41 hours of preparation for the final written exam (60 % of the overall grading) Total study load (in hours): 156

Teaching results: The aim of the training is to acquire knowledge in the field of corporate income tax and value added tax, consolidation and deepening of knowledge and skills in keeping accounting records and gaining the competence to compile a corporate income tax declaration, value added tax declaration and control report for value added tax. By completing the course, students will gain: knowledge - quantification of profit before tax, income adjustment, tax profit adjustment, tax accounting and calculation of profit after tax, identification of taxable transactions and mastering the basic rules of value added tax, skill - determine and apply accounting procedures in the accounting of a legal entity entrepreneur with an emphasis on the analysis of tax deductibility of costs and revenues, adjustment of profit before tax on the basis of income tax, assess individual types of taxable transactions in terms of determining the amount of tax liability or tax deduction of added value,

Competence - assessment of the possibility of applying expenses / costs in the calculation of the tax base, compilation of corporate income tax declaration, compilation of value added tax declaration, compilation of control report for value added tax.

Indicative content:
Property taxes as a subject of accounting in business legal entities. Calculation of tax base and taxes: Motor vehicle tax, real estate tax, other direct taxes. Compilation of tax declaration for selected property taxes. Income tax from dependent activity as a subject of accounting. Employers' employment tax obligations. Accounting of costs, revenues, calculation of profit before tax and its adjustment on a tax basis. Tax analysis of costs and revenues focused on tax deductibility, limits set by the Income Tax Act or special legislation. Compilation of a corporate income tax declaration. Value added tax, taxable persons, registration obligation, taxable transactions (domestic, within the European Union, with third countries). Exempt transactions (with right to deduct tax and without right to deduct tax). Value added tax documentation.

Support literature:
1. Právne predpisy upravujúce oblasť účtovníctva a daní.
2. Príklady a podklady v elektronickej podobe poskytované prostredníctvom e-learningového portálu.
3. Štúdie vo vedeckých časopisoch a zborníkoch a články v odborných časopisoch.

Syllabus:
1. Corporate income tax - theoretical basis of corporate taxation. Basic structural elements of corporate income tax.
2. The relationship between the accounting and tax system in determining the tax base and corporate income tax in the conditions of the Slovak Republic.
3. Accounting presentation and tax deductibility of expenses / costs related to: creation of provisions and adjustments, assignment and write-off of receivables.
4. Accounting presentation and tax deductibility of overdue liabilities, subsequent adjustment of the tax base in the tax period in which the liabilities were paid, remission of liabilities.
5. Problems of transformation of profit or loss based on income tax and its consequences. Items that increase and decrease profit or loss.
6. Items deductible from the tax base: deduction of tax loss, deduction of expenses (costs) for research and development. Tax relief for recipients of investment aid. Tax relief for incentive recipients. Income tax declaration of income of legal entities.
7. Value added tax: taxable persons, registration obligation, taxable transactions, determination of the place of taxable transaction.
8. Basic principles of the value added tax mechanism: tax liability, tax deduction, excessive deduction.
9. Application of value added tax in the implementation of taxable transactions in the country.
10. Application of value added tax to taxable transactions with other Member States of the European Union and with third countries.
11. Obligations of persons liable to pay value added tax. Relation of accounting and tax declaration to value added tax.
12. Accounting and tax system in a market economy and their relationship. Accounting concepts (models) in relation to the tax system.
13. Tax harmonization in EU countries.

Language whose command is required to complete the course:

Notes:

Assessment of courses
Total number of evaluated students: 979

A	B	C	D	E	FX
4.29	17.06	28.19	28.19	17.98	4.29

Lecturer: Ing. Miroslava Vašeková, PhD., Ing. Adriana Surovičová, PhD., Ing. Anton Marci, PhD.

Date of the latest change: 17.02.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

DESCRIPTION OF COURSE

University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KÚA FHI/IIE21010/21	Title of course: Analysis of the Financial Statements

Type, load and method of teaching activities:
Form of course: Lecture / Practical
Recommended load of course (number of lessons):
Per week: 2 / 2 Per course: 26 / 26
Method of study: present

Number of credits: 6

Recommended semester/trimester of study: 3.

Degree of study: I., II.

Prerequisites:

Requirements to complete the course:
Requirements to complete the course – daily form:
Interim written exam focused on control of acquired theoretical and practical knowledge 25%
Final semester seminar work 15%
Oral examination 60%
Total study load (in hours): 156
Participation in lectures: 26 hours
Participation in seminars: 26 hours
Preparation for seminars: 26 hours
Elaboration of the final semester seminar work: 14 hours (15% of the overall grading)
Preparation for interim examination: 20 hours (25% of the overall grading)
Preparation for the final oral examination: 44 hours (60% of the overall grading)

Student workload:
Requirements to complete the course – daily form:
Interim written exam focused on control of acquired theoretical and practical knowledge 25%
Final semester seminar work 15%
Oral examination 60%
Total study load (in hours): 156
Participation in lectures: 26 hours
Participation in seminars: 26 hours
Preparation for seminars: 26 hours
Elaboration of the final semester seminar work: 14 hours (15% of the overall grading)
Preparation for interim examination: 20 hours (25% of the overall grading)
Preparation for the final oral examination: 44 hours (60% of the overall grading)

Teaching results:
The purpose of the teaching is to acquire knowledge, skills and competences in the field of detailed analysis of the financial statements of entrepreneurs maintaining their books under the system of double entry bookkeeping, in the field of calculation and economic interpretation of financial analysis´ ratios with the intention to build in students the ability to assess the financial health of the accounting entity and use the results acquired by the analysis of the financial statements in the financial management and in making economic decisions.

After the completing the course students gain:

a) knowledge – comprehensive understanding of the methods and procedures for assessing the financial position and financial performance of business accounting entities in terms of fundamental analysis and elementary methods of technical analysis, in terms of economic interpretation of calculated ratios and their use in the decision-making process;

b) skills – to apply the acquired theoretical knowledge about financial analysis methods in the process of analysis of the financial health of particular accounting entities; to calculate and economically interpret the results; to compare them over time, within the industry, region; to make the relevant economic decisions aimed at supporting strengths and eliminating weaknesses of accounting entities;

c) competences – to perform a financial analysis of selected accounting entities, to evaluate ratios characterizing financial health, to be able to predict the development of ratios in the future, to perform analysis in time and in the region, to propose measures to maintain favorable developments in the future and eliminate risk factors and factors affecting financial health in a negative way.

Indicative content:

Introduction to financial analysis. Methods and procedures of financial analysis, financial analysis´ ratios. Basic sources of input data for financial analysis. Analysis of the financial position of the accounting entity based on information presented in the balance sheet. Horizontal analysis of the balance sheet, vertical analysis of the balance sheet. Analysis of the financial performance of the accounting entity based on information presented in the income statement. Analysis of cash flows of the accounting entity based on information presented in the cash flow statement. The use of liquidity ratios and profitability ratios in evaluation of the accounting entity´s financial health. The use of activity (turnover) ratios and debt ratios in evaluation of the accounting entity´s financial health. The analysis of financial and non- financial information presented in annual report in evaluation of the accounting entity´s financial health. The prediction and bankruptcy models. The use of financial analysis results in the decision-making process. The analysis of the accounting entity´s competitiveness based on evaluation of its financial position and financial performance.

Support literature:

ŠLOSÁROVÁ, A. – BLAHUŠIAKOVÁ, M. Analýza účtovnej závierky. Druhé, prepracované a doplnené vydanie. Bratislava: Wolters Kluwer, 2020, 440 s. ISBN 978-80-571-0166-6.

KOTULIČ, R. – KIRÁLY, P. – RAJČÁNIOVÁ, M. Finančná analýza podniku. Tretie, prepracované a doplnené vydanie. Bratislava: Wolters Kluwer, 2018, 232 s. ISBN 978-80-8168-888-1.

MAYNARD, J. Financial Accounting, Reporting and Analysis. Oxford UP, 2017. ISBN 978-0-198-74531-0.

CARLON, S. Financial Accounting: Reporting, Analysis and Decision Making, 6th Edition. Wiley, 2018. ISBN 978-0-730-35614-1.

FRIDSON, M. – ALVAREZ, M. Financial Statement Analysis. A Practitioner´s Guide. Hoboken, New Yersey: John Wiley & Sons, Inc., 2011. ISBN 978-0-470-63560-5.

Právne predpisy z oblasti účtovníctva podnikateľských subjektov.

Štúdie vo vedeckých časopisoch a zborníkoch a články v odborných a vedeckých časopisoch

Syllabus:

1. Introduction to financial analysis.
2. Methods and procedures of financial analysis, financial analysis´ ratios.
3. Basic sources of input data for financial analysis.
4. Analysis of the financial position of the accounting entity based on information presented in the balance sheet.
5. Horizontal analysis of the balance sheet, vertical analysis of the balance sheet.

6. Analysis of the financial performance of the accounting entity based on information presented in the income statement.
7. Analysis of cash flows of the accounting entity based on information presented in the cash flow statement.
8. The use of liquidity ratios and profitability ratios in evaluation of the accounting entity´s financial health.
9. The use of activity (turnover) ratios and debt ratios in evaluation of the accounting entity´s financial health.
10. The analysis of financial and non- financial information presented in annual report in evaluation of the accounting entity´s financial health.
11. The prediction and bankruptcy models.
12. The use of financial analysis results in the decision-making process.
13. The analysis of the accounting entity´s competitiveness based on evaluation of its financial position and financial performance

Language whose command is required to complete the course:

Notes:

Assessment of courses
Total number of evaluated students: 785

A	B	C	D	E	FX
26.11	25.61	23.44	13.38	10.32	1.15

Lecturer: doc. Ing. Miriama Blahušiaková, PhD., Ing. Kornélia Lovciová, PhD.

Date of the latest change: 17.02.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

DESCRIPTION OF COURSE

University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KÚA FHI/IIE21024/21	Title of course: Auditing I

Type, load and method of teaching activities: Form of course: Lecture / Practical Recommended load of course (number of lessons): Per week: 2 / 2 Per course: 26 / 26 Method of study: present

Number of credits: 6

Recommended semester/trimester of study: 2.

Degree of study: II.

Prerequisites:

Requirements to complete the course: 26 hours of lectures 26 hours of seminars 26 hours of preparation for the seminars 24 hours of preparation for the interim concept check test 54 hours of preparation for the exam Total study load (in hours): 156

Student workload: 26 hours of lectures 26 hours of seminars 26 hours of preparation for the seminars 24 hours of preparation for the interim concept check test 54 hours of preparation for the exam Total study load (in hours): 156

Teaching results: Learning Outcomes Auditing is a section that has a national and international standing. The issues that are the subject of auditing are broad and to a large extent it is necessary to use and apply knowledge from other disciplines. The aim of the course Audit 1 is to teach students the basic framework in which statutory audit operates in terms of its position in the economic environment. At the same time, to teach students, through the connection of theory and practical applications, the essence of the audit procedures performed within the auditor's initial work. Audit 1 forms the basis for the continuing subject Audit 2. Knowledge The subject will gain knowledge of the legal framework applicable to statutory audit. At the same time, he/she will learn to understand the auditor's responsibilities from a moral, ethical, and legal perspective. The graduate will gain knowledge of the activities that must be performed in accepting the audit engagement, audit risk assessment and evaluation, and take adequate responses to the identified risk in accordance with the requirements of International Standards on Auditing. At the same time, he/she will master the issues related to audit planning, understanding the importance of

the internal control system and determining the level of materiality in accordance with the practical application.
Competences
Following the acquired knowledge, the student is able to solve various model situations related to the variability of the audit environment. The student acquires coherent thinking in connection with the interconnectedness of the problem. Last but not least, the student will have knowledge of the content of audit documentation in relation to the content of the course.

Indicative content:
Indicative content:
Historical conditionality and development of audit, nature and goal of audit. Transnational and national audit regulation. Definition of the auditor's responsibilities in relation to the legal, moral and ethical level. Ethics in auditing, auditor independence. Activities related to order acceptance and audit risk assessment. Work with accounting documentation. Application of analytical procedures in order to identify risk areas of the audit. Audit quality control. Audit identification and assessment. Auditor's communication with management and those charged with governance. Auditor's response to identified risks. Audit planning. Nature and content of audit documentation. Internal control system. Internal control system testing. Evaluation of the degree of reliance on the internal control system. Determining the level of materiality in the audit. Use of financial analysis in audit. Use of IT in audit. Internal audit, defining the differences between internal audit and audit of financial statements. Cooperation of the external auditor with the internal auditor. Creation of audit documentation. Practical aplication and case studies.

Support literature:
1. Madera, F.: Audit and Auditing. Bratislava, 2015.
2. Mullerová, L., Králiček, V.: Auditing. Praha, 2020
3. Hayes, R., Wallage P., Gortemaker H.: Principles of Auditing. 2014
4. Krišková, P., Užík, J.: Methodological aspects of the implementation of auditing standards as part of the economic and legal environment of the Slovak Republic, Praha, 2020
5. Kareš, L., Krišková, P., Užík, J: Auditing 1 – case studies, Bratislava, 2018
6. Act No. 423/2015 Coll Act on Statutory Audit and on Amendments to Act No. 431/2002 Coll. on accounting as amended.
7. Act No. 431/2002 Coll. on accounting as amended.
8. SKAU Auditor's Code of Ethics, Auditor's Code of Ethics Handbook. 2018. https://www.skau.sk/wp-content/uploads/2020/01/Eticky-kodex-auditora-final-uprava.pdf
9. SKAU guidelines available at www.skau.sk

Syllabus:
1. Historical conditionality and development of audit, nature and goal of audit.(PR)
2. Transnational and national audit regulation. (PR)
3. Definition of the auditor's responsibilities in relation to the legal, moral and ethical level. (ZZ)
4. Ethics in auditing, auditor independence. (ZZ)
5. Activities related to order acceptance and audit risk assessment. (KZ)
6. Work with accounting documentation. Application of analytical procedures in order to identify risk areas of the audit. (KZ)
7. Audit quality control. Audit identification and assessment. Auditor's communication with management and those charged with governance. (ZZ)
8. Auditor's response to identified risks. (KZ)
9. Audit planning. Nature and content of audit documentation. (KZ)
10. Internal control system. Internal control system testing. Evaluation of the degree of reliance on the internal control system. (ZZ)
11. Determining the level of materiality in the audit. (KZ)

12. Use of financial analysis in audit. Use of IT in audit. (PR)
13. Internal audit, defining the differences between internal audit and audit of financial statements. Cooperation of the external auditor with the internal auditor. Creation of audit documentation. (PR)
PR - overview, ZZ - basic knowledge, KZ - key knowledge

Language whose command is required to complete the course:
slovak

Notes:

Assessment of courses
Total number of evaluated students: 916

A	B	C	D	E	FX
18.67	28.17	23.8	19.21	9.39	0.76

Lecturer: Ing. Petra Krišková, PhD., Ing. Ján Užík, PhD., doc. Ing. Mgr. Zuzana Juhászová, PhD.

Date of the latest change: 17.02.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

DESCRIPTION OF COURSE

University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KAI FHI/IIA21550/21	Title of course: Big Data

Type, load and method of teaching activities: Form of course: Lecture / Practical Recommended load of course (number of lessons): Per week: 2 / 2 Per course: 26 / 26 Method of study: present

Number of credits: 6

Recommended semester/trimester of study: 2.

Degree of study: II.

Prerequisites:

Requirements to complete the course: Exercises 40% Exercises include the development and defense of projects, which students work on in exercises during the semester. Each project submitted is graded separately and the student must achieve at least a 51% pass rate when the results are aggregated. Verifies the summative level of learning outcomes D., E. Examination 60% of the grade. The exam consists of two parts: a test and a specific problem-solving task. The test verifies the level of learning outcomes A.,B., C.

Student workload: Total study load (in hours): 6 credits x 26 hours = 156 hours Distribution of study load Lectures and seminar participation: 52 hours Preparation for seminars: 13 hours Written assignments: 13 hours Final exam preparation: 60 hours

Teaching results: Upon completion of the course, students should be able to: A. define the basic concepts of big data management and analysis, B. recognize the challenges that organizations face with big data C. understand big data as it affects business, scientific progress, and our daily lives. D. the ability to design scalable solutions for organizations of different types E. Analyze and solve problems related to the processing and use of big data both conceptually and practically for a variety of industries such as government organizations, manufacturing, retail, education, banking/finance, healthcare and pharmaceuticals, and more.

Indicative content: 1. Introduction to the problem of big data. 2. Current challenges, trends and applications of big data 3. Data types and data formats of big data. 4. Introduction to Hadoop, how Hadoop works 5. Hadoop ecosystem 6. Principles of HDFS 7. Technologies for big data management

8. YARN, HBase, Hive, Pig
9. Basic principles and data processing with MapReduce
10. HBase principles
11. Technologies for big data management
12. Algorithms for big data analysis
13. Big data application perspective and big data implementation issues

Support literature:
1. Hendl, J.:Big data - Věda o datech, základy a aplikace (česky), Grada 2021
2. Holubová I., Kosek j., Minařík k., Novák D.: Big Data a NoSQL databáze. Grada, 2015, ISBN 9788024754666
3. Matthew J. Salganik. (2017). Bit by Bit: Social Research in the Digital Age. Princeton University Press.
4. Cathy O'Neil. (2016). Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy. Penguin Books.
5. Rob Kitchin. (2014). The Data Revolution: Big Data, Open Data, Data Infrastructures and Their Consequences. SAGE Publications
6. Lockwood, Glenn. (2014). Conceptual Overview of Map-Reduce and Hadoop. Blog Post (http://www.glennklockwood.com/data-intensive/hadoop/overview.html)
7. Lazer, David, Ryan Kennedy, Gary King, and Alessandro Vespignani. (2014). The Parable of Google Flu: Traps in Big Data Analysis. Science 343(6176): 1203-1205.
8. Lazer, David. (2015). The Rise of the Social Algorithm. Science 348(6239): 1090-1091.
9. Anand Rajaraman and Jeffrey David Ullman (2011) Mining of Massive Datasets ISBN-10: 1107015359
ISBN-13: 978-1107015357
10. Murugesan, San; Bojanova, Irena, (2016) Encyclopedia of cloud computing. Wiley-IEEE Press. ISBN: 9781118821954

Syllabus:
Within the course, the content will focus on the following three areas:
• Introduction to the problem of big data. Current challenges, trends and applications.
It also includes topics such as the history of big data, their elements, types, advantages, disadvantages, etc.
Definition of big data, enterprise / structured data, social / unstructured data, unstructured data for analytical services, which are large data sets, sources of big data, industries using big data, challenges we face in the field of big data.
Use of big data in enterprises and businesses. A Big Data application perspective that covers topics such as the use of big data in marketing, analysts, retail, healthcare, consumer goods, defense, government, and so on.
• Algorithms for analyzing big data. Knowledge mining algorithms and UIs that have been developed specifically to solve the problems of processing big data.
Data mining algorithms for big data and data streams.
• Technologies for managing big data. Big Data technologies and tools, with special emphasis on the Map-Reduce paradigm and the Hadoop ecosystem.
This area covers such topics as the introduction to Hadoop, the operation of Hadoop, Cloud computing (features, benefits, applications). Understanding the Hadoop and its ecosystem, which includes HDFS, MapReduce, YARN, HBase, Hive, Pig, Sqoop, Zookeeper, Flume, Oozie, etc.
The basics of MapReduce and HBase emphasize the creation of a simple mapreduce framework and the concepts that apply to it. This area also covers the stack of large data files, i. data source layer, receive layer, source layer, security layer, visualization layer, visualization approaches, etc.

This area also covers information about NoSQL data management systems, including document databases, relationships, graph databases, schema-free databases, and so on

Language whose command is required to complete the course:
slovak

Notes:

Assessment of courses
Total number of evaluated students: 541

A	B	C	D	E	FX
32.16	31.05	17.56	9.24	9.8	0.18

Lecturer: doc. Ing. Jaroslav Kultan, PhD., Ing. Mgr. Peter Schmidt, PhD.

Date of the latest change: 01.02.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

DESCRIPTION OF COURSE

University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KAI FHI/IIA21500/21	Title of course: Business Intelligence

Type, load and method of teaching activities: Form of course: Lecture / Practical Recommended load of course (number of lessons): Per week: 2 / 2 Per course: 26 / 26 Method of study: present

Number of credits: 6

Recommended semester/trimester of study: 3.

Degree of study: II.

Prerequisites:

Requirements to complete the course: Exam 60% The exam consists of two parts: the evaluation of the theoretical knowledge and knowledge of modelling of a specific example. The first part, verifies the achievement level of the teaching results A. C. E. G., whereas the second part verifies the level of the teaching results D, F. Assignments during the semester 40% The project should be designed and defended. The evaluation of the students involves project and answers to the supplementary questions. The project evaluation and subsequent short test shall assess the following teaching results: A. B., C. D. H. I.

Student workload: Student workload (in hours): 6 credits x 26 hours = 156 hours Distribution of study load: Attendance at seminars: 26 hours Preparation for seminars: 26 hours Preparation for project and test: 52 hours Preparation for the exam: 26 hours

Teaching results: In particular, students acquire the following abilities: A. knowing how to create multidimensional data models and different approaches for developing data warehouses, B. managing the creation of data warehouses in the MySQL database and modelling in SqlDBM, C. be capable of creating and managing ETL processes at the conceptual, logical and physical levels, D. developing data hypercubes and applying MDX queries, E. knowing how to apply reporting and visualisation methods (queries, charts, dashboards), F. optimizing data warehouse (materialized views, bitmap and bitmap-join indexes, partitions) G. understanding the basic concepts of data mining for business intelligence, H. working with the software and platforms approved by university; I. managing team cooperation in the development of a business intelligence solutions.

Indicative content: 1. Business intelligence concept and the disposition level of data, comparison with the transactional level.

2. Multidimensional data models, data warehouses and data marts (Inmonn and Kimball approaches).
3. Managing slowly and fastly changing dimensions and managing hierarchies of dimensions.
4. ROLAP, MOLAP and HOLAP.
5. Conceptual model of data warehouse and MultiDim.
6. ETL / ELT processes.
7. External and internal data sources and data quality indicators.
8. Data governance a master data management.
9. Business intelligence architectures.
10. Querying data warehouses SQL a MDX queries.
11. Reporting a visualization (dashboard, graphical outputs, critical indicators of performance).
12. Data warehouse optimization.
13. Life cycles of business intelligence solutions, project team, managing project team and pre-project analyses.

Support literature:

NĚMEC R. (2014). Principy projektování a implementace systémů business intelligence. VŠB-TU Ostrava, Ostrava.
VAISMAN A., ZIMANYI E. (2014). Data Warehouse Systems - Design and Implementation. Springer-Verlag, Berlin Heidelberg.
KIMBALL R. (2002). The Data Warehouse Toolkit, John Wiley & Sons.
HUMPHRIES M., HAWKINS M., DY M.. (2002) Data warehousing Principy a praxe, Computer Press.
GROSSMANN W., RINDERLE-MA S. (2015). Fundamentals of Business Intelligence. Springer-Verlag Berlin Heidelberg.
BRAMER M. (2020). Principles of Data Mining. Springer-Verlag London.
JENSEN C.S., PEDERSEN T.B., THOMSEN C. (2010). Multidimensional Databases and Data Warehousing. Morgan & Claypool.

Syllabus:

Language whose command is required to complete the course:
slovak

Notes:

Assessment of courses
Total number of evaluated students: 599

A	B	C	D	E	FX
14.86	24.87	31.72	19.87	7.85	0.83

Lecturer: doc. Dr. Ing. Miroslav Hudec, Ing. Veronika Horniaková, PhD.

Date of the latest change: 01.02.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

DESCRIPTION OF COURSE

University: University of Economics in Bratislava	

Faculty: Faculty of Economic Informatics

Course code: KŠ FHI/IID22320/21	**Title of course:** Demographic Statistics

Type, load and method of teaching activities: **Form of course:** Lecture / Practical **Recommended load of course (number of lessons):** **Per week:** 2 / 2 **Per course:** 26 / 26 **Method of study:** present

Number of credits: 5

Recommended semester/trimester of study: 3.

Degree of study: II.

Prerequisites:

Requirements to complete the course: 30 % credit written work 70 % final exam

Student workload: Total study load (in hours): 130 hours Lectures participation: 26 hours Seminar participation: 26 hours Preparation for seminars: 13 hours Preparation for written assignment: 26 hours Exam preparation: 39 hours

Teaching results: At the end of the semester, students gain an overview of demographic approaches and opportunities that help analyze and evaluate the current demographic situation in society. In particular, students acquire the following abilities: - Students will be able to correctly interpret and analyze demographic rates. They will acquire skill in the construction of mortality tables and life tables in general. Students acquire in particular the following skills: - Students will demonstrate knowledge of basic knowledge about the principles of demographic data collection, correctly understand the demographic development in society, the migration situation in the country. Students will acquire the following competencies: - Acquired knowledge after completing the subject of demographic statistics enabling the student to perform a basic analysis in the field of population statistics and projections of population development.

Indicative content: The content of the course is to master the basic methods of analysis of population development, the use of individual sources of demographic data, the acquisition of demographic terminology, demographic indicators, demographic symbolism. The demographic statics part contains the structure of the population mainly by age and sex, but also other structures such as marital status, religion, etc. The demographic dynamics section analyzes demographic events, their correct

interpretation and uses demographic models - mortality, marriage, fertility, divorce, abortion and migration. The course also includes the theoretical basis of the current demographic development.

Support literature:
1. KLUFOVÁ, R., POLÁKOVÁ,, Z. : Demografické metody a analýzy: demografie české a slovenské populace. 1. vyd. Praha: Wolters Kluwer ČR, 2010.308s. ISBN 978-80-7357-546-5
2. KOSCHN, F.: Vybrané demografické modely, 1. vyd. Praha: VŠE, 2002. 51s. ISBN 80-245-0273-9
3. KOSCHN, F.: Kapitoly z ekonomické demografie, 1. vyd. Praha: VŠE, 2005. 52s. ISBN 80-245-0959-8
4. JURČOVÁ, D.: Slovník demografických pojmov, Bratislava: Edícia Akty, 2005. ISBN 80-85659-40-9
The literature will be continuously updated with the latest scientific and professional titles.

Syllabus:
1. Subject, content and structure of demography. Development of demography as a science.
2. Definition of demographic events and demographic phenomena. History of current population records and census.
3. Sources of population data. Census, content and use.
4. Natural movement of the population, its registration and use in demographic analysis.
5. Construction of demographic indicators. Time in demographic analysis and demographic network.
6. Basic structures of the population - by sex and age, other structures.
7. Mortality, mortality intensity indicators. Infant mortality and its decomposition. Standardization mortality.
8. Mortality tables, construction, calculation, use in demography.
9. Marriage and termination of marriages. Wedding tables.
10. Fertility and fertility, fertility rates and reproduction.
11. General characteristics of reproduction.
12. Population estimates and projections of population number and structure.
13. Summary of the lectured subject matter.

Language whose command is required to complete the course:
Slovak

Notes:

Assessment of courses
Total number of evaluated students: 23

A	B	C	D	E	FX
43.48	43.48	13.04	0.0	0.0	0.0

Lecturer: RNDr. Daniela Sivašová, PhD.

Date of the latest change: 07.02.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

DESCRIPTION OF COURSE

University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KMA FHI/IIC21360/21	Title of course: Differential and Difference Equations.

Type, load and method of teaching activities: Form of course: Lecture / Practical   Recommended load of course (number of lessons):   Per week: 2 / 2 Per course: 26 / 26   Method of study: present

Number of credits: 5

Recommended semester/trimester of study: 3.

Degree of study: II.

Prerequisites:

Requirements to complete the course: The semester work and the written test – 30 %   The final written test – 70 %

Student workload: Total study load (in hours): 156 hours   26 hours participation in lectures   26 hours participation in exercises   13 hours preparing for exercises   13 hours preparation for course credit   52 hours individual study in preparation for the exam

Teaching results: Knowledge. In the field of new knowledge, students will get acquainted with the multiply integral, differential and difference equations and their use in various areas of economics.   Students will understand and master not only the basic concepts, but also their properties.   Skills. In the educational process, students will acquire such theoretical and practical skills in the use and solution of differential and difference equations, which they can then use in other subjects and which will help them to solve various professional problems while studying at the University of Economics.   Competences. On the basis of completing the study of the subject, graduates are able not only to continue to actively expand their knowledge and skills, but also to acquire additional competencies in the use of differential and difference equations in various areas of economic theory and practice.

Indicative content: 1. Repetition. Double integral, triple integral, multiply integral – definition and properties.   2. Calculation of multiply integral by using iterated integral.   3. Changes of variables – polar, cylindrical and spherical coordinates.   4. Applications of multiply integral. Area and volume.   5. Differential Equations. General, particular and singular solution of differential equation. Separable and homogeneous equations.   6. Linear differential equation of the first order.   7. Some nonlinear differential equation (DE) of first order.   8. Linear DE of higher order with constant coefficients. Wronskian.

9. Nonhomogeneous linear DE. Methods – variation of parameters, typical right sides.
10. Economic applications. Linear differential system. Characteristic equation.
11. Calculus of (finite) differences. First order difference. Differences of some functions. Differences of higher order.
12. Difference equations.
13. Linear difference equation of the first order. Linear system of difference equation.

Support literature:
1. SAKÁLOVÁ, K. – STREŠŇÁKOVÁ, A: 2011. Množný integrál a diferenciálne rovnice. Bratislava : Ekonóm EUBA, 2011. 171. ISBN 978-80-225-3189-4.
2. PELLER. F. – PINDA, Ľ. – FECENKO, Ľ.: 2001. Matematika 3. Bratislava : IURA Edition Bratislava, 2001. ISBN 80-88715-97-0.

Syllabus:
1. Repetition. Double integral, triple integral, multiply integral – definition and properties.
2. Calculation of multiply integral by using iterated integral.
3. Changes of variables – polar, cylindrical and spherical coordinates.
4. Applications of multiply integral. Area and volume.
5. Differential Equations. General, particular and singular solution of differential equation. Separable and homogeneous equations.
6. Linear differential equation of the first order.
7. Some nonlinear differential equation (DE) of first order.
8. Linear DE of higher order with constant coefficients. Wronskian.
9. Nonhomogeneous linear DE. Methods – variation of parameters, typical right sides.
10. Economic applications. Linear differential system. Characteristic equation.
11. Calculus of (finite) differences. First order difference. Differences of some functions. Differences of higher order.
12. Difference equations.
13. Linear difference equation of the first order. Linear system of difference equation.

Language whose command is required to complete the course:
slovak

Notes:

Assessment of courses
Total number of evaluated students: 0

A	B	C	D	E	FX
0.0	0.0	0.0	0.0	0.0	0.0

Lecturer: prof. RNDr. Katarína Sakálová, CSc., RNDr. Anna Strešňáková, PhD.

Date of the latest change: 01.02.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

DESCRIPTION OF COURSE

University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KMA FHI/IIC21230/21	Title of course: Effective Communication for Actuaries

Type, load and method of teaching activities: Form of course: Practical Recommended load of course (number of lessons): Per week: 4 Per course: 52 Method of study: present

Number of credits: 5

Recommended semester/trimester of study: 3.

Degree of study: II.

Prerequisites:

Requirements to complete the course: 20 % semester seminar work, resp. project, 10 % continuous processing of case studies. 70 % combined exam.

Student workload: Total study load (in hours): 130 hours 52 hours of exercise, 30 hours of self-study in preparation for the exam, 24 hours preparation for seminars, 24 hours elaboration of a semester project.

Teaching results: Completion of the course Effective communication of actuaries presupposes the development of communication skills and skills in the decision-making process in actuarial practice (also in context ERM). Knowledge At the level of knowledge, the student will gain modern knowledge of effective communication, understand the functioning of formal and informal communication flows, the theoretical basis of professional managerial verbal and nonverbal communication. Competences To teach students to professionally use individual components of effective communication in interpersonal in-house work processes in correlation with European standards. To teach students to compile and apply in actuarial practice a communication model supporting the applied management style and corporate culture of the organization. To teach students to use communication strategies to resolve interpersonal and inter-group conflicts and to promote the strategic interests of the insurance company. Skills In practical skills, the student will gain the ability to present actuarial ideas and arguments, both in written and oral form so that they are understandable to non-actuaries. It is expected that the actuar will be able to prepare a draft written document for non-actuaries, which will explain the basic principles and will not contain incomplete or false facts or unconfirmed opinions. It is also expected that the actuary is able to lecture on a professional topic in front of laymen.

Indicative content:
1. Techniques used in effective oral and written communication
2. Effective communication techniques to communicate the results of actuarial work to the relevant audience of co-workers, managers or guests.
3. Preparation of a comprehensive summary of technical actuarial results.
4. Preparation of an effective management summary for the result of the actuarial work.
5. Creation of permanent documentation for the result of actuarial work.
6. Problem solving and decision making in actuarial work.
7. Culture and structure of the organization in the decision-making process.
8. Factors of the decision-making process.
9. Time management.
10. Project management.
11. Professional standards.
12. Ethics of actuarial work.
13. Professional misconduct. Obligations of the actuar. Public interest. Frauds.

Support literature:
1. CARDON, P. Business Communication. Developing Leaders for a Networked World. 4th edition. McGraw-Hill Education, 2020.
2. GUFFEY, M. E. Essential of Business Communication. Cengage Learning, 2018.
3. COOK, G. Guide to Business Etiquette. Pearson, 2010.
4. FITZGERALD, J. Business Data, Communications and Networking. Wiley, 2017.
5. MCLEOD, V. Effective Communication at Work. Rockridge Press, 2020.
6. CIPRA, T. Riziko ve financích a pojišťovnictví: Basel III a Solvency II. Praha : Ekopress, 2015.

Syllabus:
1. Techniques used in effective oral and written communication
2. Effective communication techniques to communicate the results of actuarial work to the relevant audience of co-workers, managers or guests.
3. Preparation of a comprehensive summary of technical actuarial results.
4. Preparation of an effective management summary for the result of the actuarial work.
5. Creation of permanent documentation for the result of actuarial work.
6. Problem solving and decision making in actuarial work.
7. Culture and structure of the organization in the decision-making process.
8. Factors of the decision-making process.
9. Time management.
10. Project management.
11. Professional standards.
12. Ethics of actuarial work.
13. Professional misconduct. Obligations of the actuar. Public interest. Frauds.

Language whose command is required to complete the course:
slovak

Notes:

Assessment of courses
Total number of evaluated students: 10

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Lecturer: Ing. Mgr. Zuzana Krátka, PhD.	
Date of the latest change: 01.02.2022	
Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.	

University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KMA FHI/IIC21240/21	**Title of course:** Enterprise Risk Management

Type, load and method of teaching activities:
  Form of course: Lecture / Practical
  Recommended load of course (number of lessons):
  Per week: 2 / 2 **Per course:** 26 / 26
  Method of study: present

Number of credits: 4

Recommended semester/trimester of study: 4.

Degree of study: II.

Prerequisites:

Requirements to complete the course:
 30 % semester seminar work,
 40 % written exam,
 30 % oral exam.

Student workload:
 Total study load (in hours): 104 hours
 26 hours of lectures,
 26 hours of exercise,
 13 hours preparation for exercise,
 13 hours elaboration of a semester seminar work,
 26 hours of self-study in preparation for the exam.

Teaching results:
 The course Enterprise Risk Management provides a theoretical and practical guide to the application of the results of Enterprise Risk Management (ERM), including quantitative methods of risk measurement and modeling, with a focus on financial institutions.
 Knowledge
 Students will gain knowledge of the principles and tools of the ERM, the identification, analysis, evaluation, mitigation, monitoring and communication of risks at the enterprise level, as well as the regulatory frameworks of Solvency II and Basel III.
 Competences
 After completing the course Enterprise Risk Management, students are able to independently apply the main principles and techniques ERM in practical situations and analyze the consequences of risk on capital requirements, including regulatory capital requirements Solvency II and Basel III.
 Skills
 After completing the course, students are able to obtain the necessary information about risk management from available sources, classify and critically approach them, use theoretical knowledge in the analysis of various types of risks (especially market risk, credit risk, liquidity risk and underwriting risk) and clearly interpret and present the results achieved.

Indicative content:
 1. The concept and framework of Enterprise Risk Management (ERM) – basic concepts, principles and benefits of ERM. The structure of risk management and controls within an insurance company.

2. The role of regulators in ERM. Legal and regulatory frameworks Solvency II and Basel III. The role of credit rating agencies in the ERM.
3. ERM process. Identification, analysis, evaluation, mitigation, monitoring and communication of risks at the company level.
4. Risk identification. Definitions and concepts of risk. Risk classification.
5. Types of risks, including underwriting, market, credit and operational risks.
6. Risk measurement and modeling. Use of risk management models in the context of pricing, reserving, valuation of assets and liabilities and capital management.
7. Solvency and profitability of the insurance company and capital management. Consequences of risk on capital requirements, including economic and regulatory capital requirements.
8. Asset and Liability Management (ALM).
9. Risk aggregation methods.
10. Risk mitigation, risk mitigation techniques.
11. Risk monitoring and exposure. The importance of risk reporting to managers and other stakeholders.
12. Implications of risks on strategic planning and strategy selection.
13. Comprehensive use of the ERM in practical situations.

Support literature:
1. Lam, J. (2014). Enterprise Risk Management. John Wiley.
2. Cipra, T. (2015). Riziko ve financích a pojišťovnictví: Basel III a Solvency II. Ekopress, Praha.
3. Páleš, M. a kol. (2021). Aktuárstvo. Vydavateľstvo Letra Edu, Bratislava.
4. Horáková, G. – Páleš, M. – Slaninka, F. (2015). Teória rizika v poistení. Vydavateľstvo Wolters Kluwer, Bratislava.
5. Chapman, R. J. (2015). Simple Tools and Techniques for Enterprise Risk Management. John Wiley.
6. Duckert, G. H. (2011). Practical Enterprise Risk Management. John Wiley and Sons, Inc., New Jersey.

Syllabus:
1. The concept and framework of Enterprise Risk Management (ERM) – basic concepts, principles and benefits of ERM. The structure of risk management and controls within an insurance company.
2. The role of regulators in ERM. Legal and regulatory frameworks Solvency II and Basel III. The role of credit rating agencies in the ERM.
3. ERM process. Identification, analysis, evaluation, mitigation, monitoring and communication of risks at the company level.
4. Risk identification. Definitions and concepts of risk. Risk classification.
5. Types of risks, including underwriting, market, credit and operational risks.
6. Risk measurement and modeling. Use of risk management models in the context of pricing, reserving, valuation of assets and liabilities and capital management.
7. Solvency and profitability of the insurance company and capital management. Consequences of risk on capital requirements, including economic and regulatory capital requirements.
8. Asset and Liability Management (ALM).
9. Risk aggregation methods.
10. Risk mitigation, risk mitigation techniques.
11. Risk monitoring and exposure. The importance of risk reporting to managers and other stakeholders.
12. Implications of risks on strategic planning and strategy selection.
13. Comprehensive use of the ERM in practical situations.

Language whose command is required to complete the course:

slovak

Notes:

Assessment of courses
 Total number of evaluated students: 130

A	B	C	D	E	FX
42.31	20.0	17.69	12.31	7.69	0.0

Lecturer: Ing. Mgr. Zuzana Krátka, PhD.

Date of the latest change: 01.02.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

DESCRIPTION OF COURSE

University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KÚA FHI/IIE21292/21	Title of course: Ethics of an accounting professional

Type, load and method of teaching activities: Form of course: Lecture / Practical   Recommended load of course (number of lessons):   Per week: 2 / 2 Per course: 26 / 26   Method of study: present

Number of credits: 6

Recommended semester/trimester of study: 2.

Degree of study: I., II.

Prerequisites:

Requirements to complete the course: 26 hours of lectures   26 hours of seminars   26 hours of preparation for the seminars   24 hours of preparation for the continuous written essay and presentation (30 % of the overall grading)   54 hours of preparation for the exam,   - out of which 27 hours of the preparation for the test (35 % of the overall grading)   - out of which 27 hours of the preparation for the theoretical part (35 % of the overall grading)   Total study load (in hours): 156

Student workload: 26 hours of lectures   26 hours of seminars   26 hours of preparation for the seminars   24 hours of preparation for the continuous written essay and presentation (30 % of the overall grading)   54 hours of preparation for the exam,   - out of which 27 hours of the preparation for the test (35 % of the overall grading)   - out of which 27 hours of the preparation for the theoretical part (35 % of the overall grading)   Total study load (in hours): 156

Teaching results: According to the Higher Education Act, the mission of a higher education institution is the education of experts with high moral principles, civic and social responsibility, as well as education for critical thinking.   The aim of the course is therefore to teach students socially responsible behavior and critical thinking, which will allow them to analyze, evaluate and model their ethical thinking, thus reducing the risk of action or thinking based on public opinion or the influence of certain authorities. By completing the course, the student should be able to use traditional and modern ethical tools applied in business ethics and socially responsible business. The topic of business ethics is an interdisciplinary scientific discipline that includes not only ethics and economics but also philosophy, sociology, etiquette or management, etc. The aim of the course is therefore to provide

comprehensive knowledge and competencies that will enable students to apply ethical thinking in the performance of the work of an accounting professional at different levels of management and in different job positions.

Knowledge

The graduate of the course will gain knowledge in the field of ethical thinking and ethical management. They will learn the basics of business ethics, ethical principles and ethical principles applied in the ethical behavior and actions in the daily practice of an accounting professional. They will learn the methods of ethical management, they will get acquainted with professional ethics, but they will also get acquainted with the consequences of unethical behavior. He will gain knowledge that will help him solve the ethical dilemmas he will encounter in his work in practice.

Skills

As part of the educational process, the student will acquire the necessary skills that will enable him to perform executive and managerial tasks related to the profession of accountant in national and multinational companies as well as in various other organizations. Students with developed critical thinking critically receive information, look for causes, evidence, and are impartial, which allows them to really perceive situations, respect ethical principles and principles and act accordingly.

Competences

Based on the acquisition of the above knowledge, the student knows how to solve the assigned tasks and perceive the need for professional ethics in the practice of an accounting professional. Acquires the basics of critical thinking when dealing with ethical dilemmas. He is able to take a stand on the topics addressed and express his own opinion in solving model situations, which in practice are solved by an accounting professional in the performance of his profession. The student thus develops competencies that are usable in most professions and will enable him to hold several functions and positions.

Indicative content:

According to the Higher Education Act, the mission of a higher education institution is the education of experts with high moral principles, civic and social responsibility, as well as education for critical thinking ...

The aim of the course is therefore to teach students socially responsible behavior and critical thinking, which will allow them to analyze, evaluate and model their ethical thinking, thus reducing the risk of action or thinking based on public opinion or the influence of certain authorities. By completing the course, the student should be able to use traditional and modern ethical tools applied in business ethics and socially responsible business. The topic of business ethics is an interdisciplinary scientific discipline that includes not only ethics and economics but also philosophy, sociology, etiquette or management, etc. The aim of the course is therefore to provide comprehensive knowledge and competencies that will enable students to apply ethical thinking in the performance of the work of an accounting professional at different levels of management and in different job positions.

Knowledge

The graduate of the course will gain knowledge in the field of ethical thinking and ethical management. They will learn the basics of business ethics, ethical principles and ethical principles applied in the ethical behavior and actions in the daily practice of an accounting professional. They will learn the methods of ethical management, they will get acquainted with professional ethics, but they will also get acquainted with the consequences of unethical behavior. He will gain knowledge that will help him solve the ethical dilemmas he will encounter in his work in practice.

Skills

As part of the educational process, the student will acquire the necessary skills that will enable him to perform executive and managerial tasks related to the profession of accountant in national and multinational companies as well as in various other organizations. Students with developed critical

thinking critically receive information, look for causes, evidence, and are impartial, which allows them to really perceive situations, respect ethical principles and principles and act accordingly.
Competences
Based on the acquisition of the above knowledge, the student knows how to solve the assigned tasks and perceive the need for professional ethics in the practice of an accounting professional. Acquires the basics of critical thinking when dealing with ethical dilemmas. He is able to take a stand on the topics addressed and express his own opinion in solving model situations, which in practice are solved by an accounting professional in the performance of his profession. The student thus develops competencies that are usable in most professions and will enable him to hold several functions and positions.

Support literature:
1. Duska, R.F. - Duska, B.Sh .: Accounting Ethics, Blackwell Publishing, Oxford 2007
2. Collective: History of Ethical Thinking in Europe and the USA, rest. Remišová, A., Ed. Calligram,
Bratislava 2008
3. Putnová, A.-Seknička, P .: Ethical management in the company, Grada, Prague 2007
4. SKAU Code of Ethics, Auditor's Code of Ethics Handbook. 2018. https://www.skau.sk/wp-content/uploads/2020/01/Eticky-kodex-auditora-final-uprava.pdf
5. IFAC 2018. IFAC Code of Ethics: http://www.ethicsboard.org/system/files/publications/files/IESBA-Handbook-Code-of-Ethics-2018.pdf
6. Janotová H. et al. Professional ethics. Euroex Bohemia, 2005
7. Remišová, A. Ethics and economics. Kalligram, Bratislava. 2011
8. Kellie A. McElhaney. Good business. A strategic guide on how to align the corporate social responsibility program with the company's brand. Eastone Books, Bratislava. 2011
9. Dalai Lama XIV. Ethics for the new millennium. Pragma, Prague 1999
10. European Court of Auditors: https://www.eca.europa.eu/en/Pages/Transparency-ethics.aspx

Syllabus:
1. Historical development of morality and ethics up to the present. Basic principles of ethical behavior.
2. Business ethics. Ethical tools used today. Evaluation of their effectiveness. Classical and modern principles, tools and methods in the application of business ethics.
3. Current trends in business ethics. Corporate Social Responsibility.
4. Sectoral and professional codes of ethics of professional organizations and chambers. Corporate codes of ethics as the most used ethical tool.
5. Ethical patterns as a tool of applied ethics in business. Ethical model as a tool of ethical management (Bata's management system).
6. Corporate culture as a source of competitive advantage in business - examples of introducing an ethical atmosphere (Ethical Atmosphere) - stories of ethically behaving companies.
7. Development of the accounting profession - present and future, shared services centers. Consequences of a pandemic on the economy with an emphasis on the accounting profession.
8. Ethical aspect of supranational regulation and national legal regulation of accounting and auditing in the Slovak Republic. The role of regulators and professional organizations in promoting ethical and professional standards in the professional profession.
9. The importance of ethics in the activities of an accounting professional. Professional ethics with a focus on the activities of an accountant, internal auditor, statutory auditor, tax advisor, etc.
10. Selected problems of application of ethical principles in managerial accounting. Ethics of a manager, ethics of a manager, ethics of an employee.
11. Selected problems of application of ethical principles in taxation and examples of failure of ethics in taxation.

12. Selected problems of applying ethical principles in the financial market - in banking, insurance, securities traders. The role of the ombudsman, cases of failure of ethics in the financial market. Ethical banks in the world.

13. Ethical dilemmas in connection with the application of ethical principles - examples of ethical failure in the performance of accounting, tax audit.

Language whose command is required to complete the course:
slovak

Notes:

Assessment of courses
Total number of evaluated students: 1301

A	B	C	D	E	FX
11.76	22.83	29.9	24.98	8.15	2.38

Lecturer: doc. Ing. Jitka Meluchová, PhD., Ing. Veronika Kňažková, PhD., Ing. Ján Vlčko

Date of the latest change: 17.02.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KMA FHI/IIC21250/21	Title of course: Financial Mathematics II

Type, load and method of teaching activities:
 Form of course: Lecture / Practical
 Recommended load of course (number of lessons):
 Per week: 2 / 2 **Per course:** 26 / 26
 Method of study: present

Number of credits: 5

Recommended semester/trimester of study: 1.

Degree of study: II.

Prerequisites:

Requirements to complete the course:
 30% written work,
 70% written exam.

Student workload:
 Total study load (in hours): 156 hours
 26 hours of lectures,
 26 hours of exercise,
 52 hours of self-study in preparation for the exam,
 13 hours preparation for seminars,
 13 hours preparation for written work.

Teaching results:
Completion of the course Financial Mathematics II presupposes the development of financial thinking over time.
Knowledge
Progress in the field of new knowledge is evident after completing the course. Students will understand the valuation of loans represented by fixed interest securities with a focus on matching the assets and liabilities of the insurance company's technical reserves. They will gain knowledge about the operation of futures trading instruments with a focus on trading strategies.
Competences
Based on the above knowledge, students are able to comment on the selection of assets with a fixed coupon and then compile a requirement for the construction of a portfolio of technical reserves of the insurance company with a focus on its immunization.
Skills
As part of the educational process, they will acquire such skills that will enable students to make a selection of long-term securities with a focus on matching with liabilities. Get acquainted with the functioning of futures contracts at futures contracts.

Indicative content:
 1. Accumulation and discount factors, inflation on projects, low start of loan repayment
 2. Fixed interest securities, Makeham's formula, yield and maturity
 3. Loan valuation, interest and capital tax, profitability
 4. Optimal loan maturity and capital gains tax, loss compensation

5. Time structure of interest rates, spot, forward interest rate, yield curve
6. Average project maturity, volatility of fixed interest securities
7. Matching of assets and liabilities, Redington's theory of immunization, full immunization
8. Futurity and forward contracts, short and long positions, clearing houses
9. Term price of a security, value of a forward contract, short position risk
10. Swaps, matching payments, capital resources while reducing costs
11. Options, payout function, internal and time value of options, option price limits
12. Put-call parity. Black – Scholes model and partial differential equation.
13. Option and stock strategies, trading strategies: synthetic contract, bear and bull spreed

Support literature:
1. Garrett, S. J.: An Introduction to the Mathematics of Finance. Oxford: Elsevier, Butterworth – Heinemann, 2013, ISBN: 978-0-08-098240-3
2. Pinda, Ľ.: Deriváty cenných papierov /Vybrané problémy/. IURA EDITION 2001. ISBN 80-88715-98-9
3. Hull, J. C.: Options, futures, and other derivative securities. 11-th Edition. Prentice-Hall International, Inc. 2018. ISBN-13: 978-0-13-6940104
4. Pinda, Ľ.: Finančná matematika I. Letra Edu 2021, ISBN: 978-80-89962-82-2
5. Pinda, Ľ.: Finančná matematika investičných projektov. Bratislava: IURA EDITION, spol. s r.o. 2010, ISBN: 978-80-8078-319-8
6. Melicherčík, I.– Olšanová, L.–Úradníček, V.: Kapitoly z finančnej matematiky. EPOS 2005. ISBN 80-8057-651-3

Syllabus:
1. Accumulation and discount factors, inflation on projects, low start of loan repayment
2. Fixed interest securities, Makeham's formula, yield and maturity
3. Loan valuation, interest and capital tax, profitability
4. Optimal loan maturity and capital gains tax, loss compensation
5. Time structure of interest rates, spot, forward interest rate, yield curve
6. Average project maturity, volatility of fixed interest securities
7. Matching of assets and liabilities, Redington's theory of immunization, full immunization
8. Futurity and forward contracts, short and long positions, clearing houses
9. Term price of a security, value of a forward contract, short position risk
10. Swaps, matching payments, capital resources while reducing costs
11. Options, payout function, internal and time value of options, option price limits
12. Put-call parity. Black – Scholes model and partial differential equation.
13. Option and stock strategies, trading strategies: synthetic contract, bear and bull spreed

Language whose command is required to complete the course:
slovak

Notes:

Assessment of courses
Total number of evaluated students: 66

A	B	C	D	E	FX
37.88	12.12	24.24	19.7	6.06	0.0

Lecturer: prof. RNDr. Ľudovít Pinda, CSc., Ing. Lenka Smažáková, PhD.

Date of the latest change: 01.02.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development

and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

University: University of Economics in Bratislava	

Faculty: Faculty of Economic Informatics	

Course code: KMA FHI/IIC21260/21	**Title of course:** Financial Mathematics III

Type, load and method of teaching activities:
 Form of course: Lecture / Practical
 Recommended load of course (number of lessons):
 Per week: 2 / 2 **Per course:** 26 / 26
 Method of study: present

Number of credits: 5

Recommended semester/trimester of study: 2.

Degree of study: II.

Prerequisites:

Requirements to complete the course:
 30% semester seminar work, resp. project,
 70% written exam.

Student workload:
 Total study load (in hours): 156 hours
 26 hours of lectures,
 26 hours of exercise,
 52 hours of self-study in preparation for the exam,
 13 hours preparation for seminars,
 13 hours preparation for written work.

Teaching results:
Completion of the course Financial Mathematics III presupposes the development of thinking in modern portfolio theory.
Knowledge
Progress in the field of new knowledge is evident after completing the course. Students will understand the construction and management of both equity and bond portfolios. They gain knowledge about the intrinsic value of assets and their properties. Using the methods described, students will learn to secure the appropriate portfolio with suitable securities derivatives.
Competences
Based on the acquired knowledge, students are able to take a position on the construction of the portfolio and its management. In conjunction with its participation in the portfolio of technical provisions, students will be able to choose a procedure and a financial derivative to hedge it against an undesirable decline.
Skills
As part of the educational process, they will acquire such skills that will enable students to implement the construction of a portfolio of securities, its management and determine the appropriate hedging strategy.

Indicative content:
 1. Types of financial markets, securities, decision criteria, historical and expected variables
 2. Modern portfolio theory, optimization problems, risk aversion
 3. CAPM model, CML and SML line, acceptable, efficient and optimal portfolio

4. Investment process, fundamental and technical analysis
5. Multi-factor model, arbitrage valuation model
6. Passive portfolio management, functions for portfolio management
7. Active management of the equity and bond portfolio
8. Characteristics of portfolio management, decomposition of total income
9. Asset portfolio management when matching with liabilities
10. Securing the equity portfolio with equity index futures contracts
11. Securing the bond portfolio with futures contracts for long-term interest rates
12. Hedging of the stock portfolio with options, delta hedging
13. Hedging strategies of the stock and the stock portfolio with options

Support literature:
1. Blake, D.: Financial market analysis. John Wiley. Sons, LTD, 2000. ISBN 0-471-87728-X
2. Pinda, Ľ.: Deriváty cenných papierov /Vybrané problémy/. IURA EDITION 2001. ISBN 80-88715-98-9
3. Hull, J. C.: Options, futures, and other derivative securities. 11-th Edition. Prentice-Hall International, Inc. 2018. ISBN-13: 978-0-13-6940104
4. Pinda, Ľ.: Finančná matematika investičných projektov. Bratislava: IURA EDITION, spol. s r.o. 2010, ISBN: 978-80-8078-319-8

Syllabus:
1. Types of financial markets, securities, decision criteria, historical and expected variables
2. Modern portfolio theory, optimization problems, risk aversion
3. CAPM model, CML and SML line, acceptable, efficient and optimal portfolio
4. Investment process, fundamental and technical analysis
5. Multi-factor model, arbitrage valuation model
6. Passive portfolio management, functions for portfolio management
7. Active management of the equity and bond portfolio
8. Characteristics of portfolio management, decomposition of total income
9. Asset portfolio management when matching with liabilities
10. Securing the equity portfolio with equity index futures contracts
11. Securing the bond portfolio with futures contracts for long-term interest rates
12. Hedging of the stock portfolio with options, delta hedging
13. Hedging strategies of the stock and the stock portfolio with options

Language whose command is required to complete the course:
slovak

Notes:

Assessment of courses
Total number of evaluated students: 19

A	B	C	D	E	FX
21.05	36.84	21.05	10.53	10.53	0.0

Lecturer: prof. RNDr. Ľudovít Pinda, CSc., Ing. Lenka Smažáková, PhD.

Date of the latest change: 01.02.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof.

RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KAI FHI/IIA21560/21	**Title of course:** Fuzzy Sets in Decision Making Processes

Type, load and method of teaching activities: **Form of course:** Lecture / Practical **Recommended load of course (number of lessons):** **Per week:** 2 / 2 **Per course:** 26 / 26 **Method of study:** present

Number of credits: 6

Recommended semester/trimester of study: 3.

Degree of study: II.

Prerequisites:

Requirements to complete the course: Exam 60% The exam consists of two parts: the evaluation of the theoretical knowledge and knowledge of modelling specific tasks. The first part, verifies the achievement level of the teaching results A., D., F., H., whereas the second part verifies the level of the teaching results B., C., E., G. Assignments during the semester 40% The purpose of seminars is to develop and defend the tasks related to modeling uncertainties and a test. The evaluation of the students also their activity during the semester. The following teaching results are evaluated B., C., D., E. G.

Student workload: Total study load (in hours): 6 credits x 26 teaching hours = 156 h Distribution of study load: lectures and seminars participation: 52 h seminar participation: 24 h tasks and test preparation: 40 h preparation of exam: 40 h

Teaching results: In particular, students acquire the following abilities: A. understanding the semantic uncertainty of real-world and appropriately handling by fuzzy sets and fuzzy logic, B. creating flexible database queries, C. logically aggregating elementary conditions, D. developing and interpreting linguistic summaries from data, E. applying fuzzy inference and classification models, F. handling and managing work with imprecise data in databases, G. applying acquired knowledge and skills in solving real-world tasks, H. gaining the overview of the role of fuzzy logic in explainable artificial intelligence.

Indicative content: 1. Introduction into fuzzy sets and fuzzy logic, and comparison with the classical logic and set theory. 2. Fuzzy arithmetic.

3. Logic aggregation functions and their applications in evaluating entities and summarizing information from data.
4. Flexible (fuzzy) relational database queries.
5. Empty and overabundant problems in queries.
6. Linguistic summaries on numeric and categorical data.
7. Fuzzy inference (Mamdani and Sugeno model, defuzzification).
8. Flexible rule-based systems and IF-THEN rules (developing rule-based systems and evaluating their quality).
9. Fuzzy relational databases (basic model and fuzzy meta model).
10. Querying on fuzzy relational databases and data warehouses.
11. Possibility and necessity measures in data evaluation.
12. Overview of the advanced concepts: type II fuzzy sets, hesitant fuzzy sets, intuitionistic fuzzy sets
13. Fuzzy logic in explainable artificial intelligence.

Support literature:
HUDEC M. (2015). Fuzzy logika pre hospodársku informatiku. Ekonóm, Bratislava.
KOLESÁROVÁ A., KOVÁČOVÁ M. (2004). Fuzzy množiny a ich aplikácie. Slovenská technická univerzita v Bratislave, Bratislava.
KLIR, G., YUAN, B. (1995). Fuzzy sets and fuzzy logic, theory and applications. Prentice Hall, New Jersey.
SILER W., BUCKLEY, J. (2005). Fuzzy expert systems and fuzzy reasoning. John Wiley & Sons, Inc, New Jersey.
ZIMMERMANN H. J. (2001). Fuzzy set theory – and its applications. Kluwer Academic Publishers, London.
HUDEC M. (2016). Fuzziness in Information Systems - How to Deal with Crisp and Fuzzy Data in Selection, Classification, and Summarization. Springer, Cham.
GALINDO, J. (Ed.) (2008). Handbook of Research on Fuzzy Information Processing in Databases. IGI Global,Hershley.

Syllabus:

Language whose command is required to complete the course:
slovak

Notes:

Assessment of courses
Total number of evaluated students: 139

A	B	C	D	E	FX
15.83	20.14	26.62	25.18	11.51	0.72

Lecturer: doc. Dr. Ing. Miroslav Hudec, Ing. Erika Mináriková

Date of the latest change: 01.02.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

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DESCRIPTION OF COURSE

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University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KÚA FHI/IIE21242/21	**Title of course:** IFRS: Consolidated Financial Statements I

Type, load and method of teaching activities: **Form of course:** Lecture / Practical **Recommended load of course (number of lessons):** **Per week:** 2 / 2 **Per course:** 26 / 26 **Method of study:** present

Number of credits: 6

Recommended semester/trimester of study: 3.

Degree of study: II.

Prerequisites:

Requirements to complete the course: 26 hours of lectures 26 hours of seminars 26 hours of preparation for the seminars 24 hours of preparation for the interim check test (40 % of the finally exam) 54 hours of preparation for the exam: of this 24 hours for the practical issues (30 % of the finally exam) and 30 hours for the theoretical issues (30 % of the finally exam). Total study load (in hours): 156

Student workload: 26 hours of lectures 26 hours of seminars 26 hours of preparation for the seminars 24 hours of preparation for the interim check test (40 % of the finally exam) 54 hours of preparation for the exam: of this 24 hours for the practical issues (30 % of the finally exam) and 30 hours for the theoretical issues (30 % of the finally exam). Total study load (in hours): 156

Teaching results: The aim of the course is to teach students to prepare consolidated financial statements for a group. As part of their education, students should understand the nature, significance and functions of consolidated financial statements. Students will get acquainted with the process of consolidation preparation and with the consolidation procedures applied in the preparation of consolidated financial statements of business entities according to IFRS adopted by the European Union. By completing the course, students will gain: knowledge - gaining knowledge about the obligation to presentation consolidated financial statements and the application of consolidation procedures (methods), understanding the specifics of consolidated financial statements prepared for a group in comparison with the individual financial statements prepared for an entity and clarifying its significance for individual users. skill – to realize initial equity consolidation and subsequent equity consolidation as a part of consolidation of subsidiary, prepare the consolidated statement of financial position and consolidated statement of profit and loss and other comprehensive income after the realized equity consolidation in the two following accounting periods.

competence - to assess whether the obligation to presentation consolidated financial statements has arisen; decide whether it is possible to apply any exemption from this obligation, identify the entities in the group and the group's shares in other entities, to prepare and ensure the process of preparation and presentation of consolidated financial statements with emphasis on obtaining and processing the necessary data and documents, to interpret the results of equity consolidation.

Indicative content:

Nature, significance and purpose of consolidated financial statements. Theoretical approaches to the interpretation of consolidated financial statements. Historical development of consolidated financial statements. The obligation to present consolidated financial statements according to Act no. 431/2002 Coll. on Accounting, as amended (further referred to as the "Accounting Act"). Exemptions from the obligation to present consolidated financial statements in accordance to the Accounting Act. Other obligations related to consolidated financial statements according to the Accounting Act. Definition of international regulation for consolidated financial statements. EU directives for consolidated financial statements. IFRSs for consolidated financial statements. Relationship between EU directives and IFRSs. The impact of international regulation on the national legal regulation of consolidated financial statements in the conditions of the Slovak Republic as a member state of the European Union. The process of preparation and presentation of consolidated financial statements. Internal regulation for consolidation in a group. General principles for the presentation of consolidated financial statements. Structure and content of consolidated financial statements according to IFRSs. Peculiarities of the structure and content of the consolidated financial statements in comparison with the individual financial statements. Business combinations according to IFRS 3 Business combinations. Connection of business combinations and consolidated financial statements. The nature of the acquisition method for business combinations, its individual components and application in the consolidated financial statements. Impairment testing of goodwill in accordance with IAS 36 Impairment of Assets. Single control model according to IFRS 10 Consolidated financial statements in comparison with Slovak legislation. Subsidiary consolidation procedures in accordance with IFRS 10. Presentation of separate financial statements in accordance with IAS 27 Separate financial statements. Preparation of the consolidated statement of financial position for the group (parent - subsidiary) with goodwill or gain from a bargain purchase. Dealing with retained earnings and other components of the subsidiary's equity at the acquisition date and after the acquisition date. Identification, measurement and presentation of non-controlling interests at the acquisition date (proportional or at fair value) and subsequent recognition of non-controlling interests after the acquisition date depending on the chosen method of their measurement at the acquisition date. Preparation of the consolidated statement profit and loss and other components of the comprehensive income for the group (parent – subsidiary) with a non-controlling interest with the acquisition date during the accounting period. Recognition of fair value adjustments, including an explanation of their effect on the amount of goodwill recognized (or on gain from bargain purchase), on non-depreciated and depreciated non-current assets, inventories, financial liabilities, assets and liabilities that are not included in the statement of financial position of the subsidiary, including contingent assets and contingent liabilities. Impairment loss of goodwill and the effect of the measurement of non-controlling interests on the recognition of an impairment loss of goodwill.

Support literature:

1. HORNICKÁ, R.: Konsolidovaná účtovná závierka I. Praktikum. Bratislava: Vydavateľstvo Ekonóm, 2018.
2. Zákon č. 431/2002 Z. z. o účtovníctve v znení neskorších predpisov.
3. Smernica Európskeho parlamentu a Rady 2013/34/EÚ z 26. júna 2013 o ročných účtovných závierkach, konsolidovaných účtovných závierkach a súvisiacich správach určitých druhov

podnikov, ktorou sa mení smernica Európskeho parlamentu a Rady 2006/43/ES a zrušujú smernice Rady 78/660/EHS a 83/349/EHS v znení neskorších úprav.

4. Nariadenie komisie (ES) č. 1126/2008 z 3. novembra 2008, ktorým sa v súlade s nariadením Európskeho parlamentu a Rady (ES) č. 1606/2002 prijímajú určité medzinárodné účtovné štandardy v platnom znení.

Syllabus:

1. Nature, significance and purpose of consolidated financial statements. Theoretical approaches to the interpretation of consolidated financial statements. Historical development of consolidated financial statements.

2. Obligation to present consolidated financial statements according to Act no. 431/2002 Coll. on Accounting, as amended (further referred to as the "Accounting Act"). Exemptions from the obligation to present consolidated financial statements in accordance to the Accounting Act. Other obligations related to consolidated financial statements according to the Accounting Act.

3. Definition of international regulation for consolidated financial statements. EU directives for consolidated financial statements. IFRSs for consolidated financial statements. Relationship between EU directives and IFRSs. The impact of international regulation on the national legal regulation of consolidated financial statements in the conditions of the Slovak Republic as a member state of the European Union.

4. Process of preparation and presentation of consolidated financial statements. Internal regulation for consolidation in a group. General principles for the presentation of consolidated financial statements according to IFRSs. Structure and content of consolidated financial statements according to IFRSs. Peculiarities of the structure and content of the consolidated financial statements in comparison with the individual financial statements.

5. Identifying of business combinations and ways of rise of the business combinations. Transactions excluded from scope of IFRS 3. Connection of business combinations and consolidated financial statements. Nature of the acquisition method for business combinations and its application in the consolidated financial statements.

6. Identifying of acquirer according to IFRS 3. Transferred consideration by the acquirer at the acquisition date (identification and measurement). Determining the acquisition date according to IFRS 3. Recognising and measuring the identifiable assets acquired, the liabilities assumed at the acquisition date according IFRS 3. Recognising and measuring the non-controlling interests at the acquisition date according to IFRS 3. Dealing with previously held equity interest at the date acquisition according IFRS 3.

7. Recognising and measuring goodwill or gain from a bargain purchase according IFRS 3. Recognising and measuring of individual components of business combination (transferred consideration, acquired assets and assumed liabilities, goodwill, non-controlling interests) after acquisition date. Measurement period according to IFRS 3. Disclosure information about business combination according IFRS 3.

8. Impairment testing of goodwill in accordance with IAS 36. Identifying the cash-generating unit to which an asset belongs. Recoverable amount and carrying amount of cash-generating unit. Allocation of goodwill to cash-generating unit or to group of cash-generating units. Impairment loss for a goodwill.

9. Single control model according to IFRS 10 in comparison with Slovak legislation. Consolidation procedures for subsidiaries (full method consolidation) in accordance to IFRS 10. Presentation of separate financial statements in accordance to IAS 27.

10. Preparation of the consolidated statement of financial position for the group (parent - subsidiary) with goodwill or gain from a bargain purchase. Dealing with retained earnings and other components of the subsidiary's equity at the acquisition date and after the acquisition date. Identification, measurement and presentation of non-controlling interests at the acquisition date

(proportional or at fair value) and subsequent recognition of non-controlling interests after the acquisition date depending on the chosen method of their measurement at the acquisition date.
11. Preparation of the consolidated statement profit and loss and other components of the comprehensive income for the group (parent – subsidiary) with a non-controlling interest with the acquisition date during the accounting period.
12. Recognition of fair value adjustments, including an explanation of their effect on the amount of goodwill recognized (or on gain from bargain purchase), on non-depreciated and depreciated non-current assets, inventories, financial liabilities, assets and liabilities that are not included in the statement of financial position of the subsidiary, including contingent assets and contingent liabilities.
13. Identifying, measuring and recognizing an impairment loss of goodwill. The effect of the measurement of non-controlling interests on the recognition of an impairment loss of goodwill.

Language whose command is required to complete the course:
slovak

Notes:

Assessment of courses
Total number of evaluated students: 807

A	B	C	D	E	FX
6.44	16.36	25.03	29.86	21.31	0.99

Lecturer: Ing. Renáta Hornická, PhD., Ing. Martina Podmanická, PhD.

Date of the latest change: 17.02.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

DESCRIPTION OF COURSE

University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KÚA FHI/IIE21172/21	Title of course: IFRS: Individual (separate) financial statements I

Type, load and method of teaching activities: Form of course: Lecture / Practical Recommended load of course (number of lessons): Per week: 2 / 2 Per course: 26 / 26 Method of study: present

Number of credits: 5

Recommended semester/trimester of study: 1., 3.

Degree of study: II.

Prerequisites:

Requirements to complete the course: 26 hours of lectures 26 hours of seminars 52 hours of preparation for the seminars 52 hours of preparation for the written exam Total study load (in hours): 130 Achievement of at least 51 % of maximum amount of points allocated for the exam

Student workload: 26 hours of lectures 26 hours of seminars 52 hours of preparation for the seminars 52 hours of preparation for the written exam Total study load (in hours): 130 Achievement of at least 51 % of maximum amount of points allocated for the exam

Teaching results: The aim of the course is to provide knowledge, competence and skills which will enable the students, within a context of supplementary IFRS´s covered by the lectures and seminars and with respect for the individual individual / separate financial statements: a) in their position of accountants to select and appropriately apply accounting policies in accordance with the underlying IFRS´s, b) in their position of the auditors to assets their appropriate application, and c) in their position of managers, investors, financial analysist, creditors and / or tax authors to reasonably interpret the achieved results. Knowledge Upon completing the course, the students gain knowledge on adoption of the IFRS in Slovak republic, on the scope and the content of the individual / separate financial statements prepared in accordance with IFRS and on the definition of the elements of financial statements (assets, liabilities, equity, expenses, income) in accordance with Conceptual framework for the financial reporting. In addition, he/she gains knowledge on accounting treatment of non-current tangible and intangible assets, inventories, leases, revenues from contract with customers, and provision, including, but limited to, selection of the relevant standard, measurements, recognition and disclosure of supplementary information in the notes to the financial statements.

Competences

Based on the acquired knowledge, the student will be able, within the context of IFRSs covered by the lectures and seminars, to: a) asses the most typical business transactions, events and other conditions, which would have an impact on the financial situation and financial performance of a business, b) following the previous assessment to select and apply the most relevant accounting policies, and c) to interpret the achieved economic results.

Skills

Within a scope of a topics covered by the lectures and courses, the student will acquire skills necessary for the appropriate application of the relevant accounting policies, to assign the appropriate accounts (and/or line items of the financial statements) the respective transactions, events and other conditions and to apply both the relevant measurement bases and analytical procedures focused on the evaluation of the achieved results.

Indicative content:

Structure of the IFRS Foundation, IFRSs and their adoption in the EU. Conceptual framework for financial reporting. Definition, identification, and the recognition of the elements of the financial statements. Structure of the complete set of the financial statements in accordance with IAS 1. Content of the balance sheet, statement of comprehensive income, statement of changes in equity, cash flow statement and notes. Measurement bases used in IFRS. Borrowing costs in accordance with IAS 23. Accounting policy, accounting estimates and correction of errors in accordance with the IAS 8. Accounting for plants, property, and equipment in accordance with IAS 16. Impairment allowances in accordance with the IAS 36. Accounting for intangible assets in accordance with IAS 38. Accounting for inventories in accordance with IAS 2. Accounting for leases in accordance with the IFRS 16. Accounting for provisions, contingent liabilities, and contingent assets in accordance with the IAS 37. Accounting for contracts with customers in accordance with IFRS 15. Impact of the accounting treatment on accounting ratios.

Support literature:

1. IFRS Foundation (2022). International Financial Reporting Standards. London.
2. TUMPACH, Miloš (2019). Účtovná politika a vykazovanie zásob podľa IAS 2. Recenzovali: Jitka Meluchová, Peter Dvorák. 1. vydanie. Bratislava : SKCÚ, 2019. ISBN 978-80-972525-5-7.
3. TUMPACH, Miloš - JUHÁSZOVÁ, Zuzana - KUBAŠČÍKOVÁ, Zuzana - KRIŠKOVÁ, Petra (2021). Datasets of Impact of the First-Time Adoption of IFRS 16 in the Financial Statements of Slovak Compulsory IFRS Adopters. In Data in Brief. - Amsterdam : Elsevier Science Publishers B.V. ISSN 2352-3409, 2021, vol. 36, no. June, pp. 1-8..
4. TUMPACH, Miloš (2014). Medzinárodné štandardy IFRS - I : praktikum. Recenzenti Ján Užík, Zuzana Kubaščíková. 1. vyd. Bratislava : Vydavateľstvo EKONÓM, . ISBN 978-80-225-3882-4.
5. TUMPACH, Miloš (2018). Medzinárodné štandardy účtovného výkazníctva. 1. vydanie. Bratislava : Vydavateľstvo EKONÓM, 2018. e-kniha 105 s. [7,41 AH]. ISBN 978-80-225-4591-4.

Syllabus:

1. Application of the IFRS in the Slovak Republic. IFRS Foundation and its bodies (IASB, IFRS IC, SAC). Structure of the IFRS (IFRS, IAS, SIC, IFRIC) and their approval for the use in the EU. Conceptual framework for financial reporting: general principles (faithful presentation, usefulness and relevance of information). Definition, identification, and the recognition of the elements of the financial statements (assets, liabilities, equity, expenses, income). Need for distinction between equity and liabilities. Structure of the complete set of the financial statements in accordance with IAS 1.
2. Balance sheet, its structure, and the distinction of the current and non-current items. Statement of comprehensive income, recognition of profit or loss and other comprehensive income.

Presentation of the operating expenses in accordance with their nature and their function. Statement of changes in equity. Cash flow statement.

3. Measurement bases, determination of fair value in accordance with IFRS 13, use of discounted cash-flows, market values and acquisition costs. Accounting for borrowing costs in accordance with IAS 23. Impact on the accounting treatment on accounting ratios.

4. Comparability of accounting information. Accounting policy and its changes in accordance with the IAS 8. Use of estimates and presentation of their changes by the entity. Comparison of accounting treatment of changes of policies and estimates. Information about the changes to presented in the notes and statement of changes in equity. Correction of errors.

5. Accounting for plants, property, and equipment in accordance with IAS 16: Scope of the standard and determination of costs for the first-time measurement (including the capitalisation of the borrowing costs, discounting of delayed payments, non-monetary transactions, acquisition funded by grants and provisions for decommissioning).

6. Accounting for plants, property, and equipment in accordance with IAS 16: Subsequent measurement (cost model and revaluation model). Impairment allowances in accordance with the IAS 36. Concept of cash-generating unit. Accounting for reversal of impairment. Accounting for the disposal of plant, property, and equipment. Schedules for changes of plants, property, and equipment in the notes to financial statements. Impact on the accounting treatment on accounting ratios.

7. Accounting for intangible assets in accordance with IAS 38. Scope of the standard, similarities with IAS 16 (first time and subsequent measurement). Distinctions between IAS 16 and IAS 38: capitalisation of expenditures for in-house research and development, limited use of both the residual and the fair values. Schedules for changes of plants, property, and equipment in the notes to financial statements. Impact on the accounting treatment on accounting ratios.

8. Accounting for inventories in accordance with IAS 2. Scope of the standard, inventories held at fair value and net realizable value through profit or loss. Determination of the acquisition cost and its similarities with procedures required by the IAS 16. Impact on the accounting treatment on accounting ratios.

9. Accounting for leases in accordance with the IFRS 16: scope of the standard, economic rationale of leases, general provisions, and accounting for the financial and operating lease by the lessor. Accounting for sale and the leaseback transactions.

10. Accounting for leases in accordance with the IFRS 16: accounting by leasee. Use of incremental borrowing rate. Exemptions for the short-term leases and leases with low value. Schedules for changes of rights to leased asset, other assets arising from leases and lease liabilities in the notes to financial statements. Impact on the accounting treatment on accounting ratios.

11. Accounting for provisions, contingent liabilities, and contingent assets in accordance with the IAS 37. Scope of the standard, economic rationale for the recognition of provisions in balance-sheet and their changes in statement of comprehensive income. Impact on the accounting treatment on accounting ratios.

12. Accounting for contracts with customers in accordance with IFRS 15: Scope of the standard and five steps for determination of the contract with a customer. Determination of the performance obligation. Determination of the consideration and its allocation to various performance obligations. Contracts realized at a point in time and over the time. Determination of the stage of completion.

13. Accounting for contracts with customers in accordance with the IFRS 15: distinction between principal and agents, accounting for consignment contracts, repurchase agreements and "bill and hold" agreements. Combination and the separation of contracts. Impact on the accounting treatment on accounting ratios.

Language whose command is required to complete the course:

slovak					

Notes:

Assessment of courses
 Total number of evaluated students: 1051

A	B	C	D	E	FX
13.99	11.23	16.08	19.31	27.5	11.89

Lecturer: prof. Ing. Miloš Tumpach, PhD.

Date of the latest change: 17.02.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

DESCRIPTION OF COURSE

University: University of Economics in Bratislava	

Faculty: Faculty of Economic Informatics

Course code: KOP OF/IOE22080/22	**Title of course:** Insurance Law

Type, load and method of teaching activities:
 Form of course: Practical
 Recommended load of course (number of lessons):
 Per week: 2 **Per course:** 26
 Method of study: present

Number of credits: 4

Recommended semester/trimester of study: 1., 3.

Degree of study: II.

Prerequisites:

Requirements to complete the course:
 10 % seminars activity,
 30 % semester work,
 60 % written exam.

Student workload:
 Student´s workload of individual educational activities: 104
 Attendance of seminars: 26
 Elaboration of a semester work: 26
 Peparation for the seminar: 26
 Preparation for the exam: 26

Teaching results:
The aim of the subject of insurance law is to provide a university student of economics with the necessary theoretical basis for mastering the basic institutes and issues related to insurance law from a theoretical and practical point of view so that they can use them in their future profession.
The subject of insurance law focuses on the acquisition of basic institutes of insurance law, specifically on the analysis of insurance law, principles of insurance law, individual types of insurance, insurance risk, legislation on insurance contracts, the status of insurance participants, duration of insurance, etc.
The teaching of the subject of insurance law focuses on the private and public law context of insurance law.

Indicative content:
The teaching of the subject of insurance law focuses on the private and public law context of insurance law.

Support literature:
ADAMKO, J. (2018). Poistenie a poistný trh. Vybrané kapitoly. Prešov: Michal Vaško – Vydavateľstvo.
JOHN, N., WESTON-SIMONS, Ch., HODGSON, L. (2022). Insurance Law Handbook. London: Bloomsbury Professional.
JERRY, H., R. II (2023). Advanced Introduction to Insurance Law. Cheltenham: Edward Elgar Publishing.

JURKOVIČOVÁ, L., KROPAJ, M., VAČOKOVÁ, L., WINKLER, M., SLEZÁKOVÁ, A., VETERNÍKOVÁ, M., HOLUB, D., MAGUROVÁ, H. (2020). Poistné právo pre ekonómov. Bratislava: Wolters Kluwer.
STEMPEL, W., J., KNUSTEN, S., E., SWISHER, N., P. (2020). Principles of Insurance Law. Durham: Carolina Academic Press.
WINKLER, M. – HOLUB, D. – JURKOVIČOVÁ, L. - KROPAJ, M. - MAGUROVÁ, H. - SLEZÁKOVÁ, A – VAČOKOVÁ, L. – VETERNÍKOVÁ, M.: Basics of Law. Bratislava: Vydavateľstvo EKONÓM, 2020, 290 s., ISBN 978-80-225-4781-9.

Syllabus:
1. Basic legal concepts in insurance law.
2. Insurance law - origin and development.
3. Insurance law - development of the 20th century. and current legislation.
4. Legal regulation of insurance law of the Slovak Republic - analysis.
5. INSURANCE CONTRACTS - PART I (General definition of IC)
6. INSURANCE CONTRACTS - II. PART (Basic concepts and subjects of IC)
7. INSURANCE CONTRACTS - III. PART (Requirements and conclusion of the IC)
8. Rights and obligations of the participants in the insurance relationship.
9. Change and termination of the insurance relationship.
10. INDIVIDUAL TYPES OF INSURANCE ACCORDING TO THE CIVIL CODE - Part 1
11. INDIVIDUAL TYPES OF INSURANCE ACCORDING TO THE CIVIL CODE - Part 2
12. INDIVIDUAL TYPES OF INSURANCE ACCORDING TO THE CIVIL CODE - Part 3
13. INDIVIDUAL TYPES OF INSURANCE ACCORDING TO THE CIVIL CODE - Part 4

Language whose command is required to complete the course:
Slovak

Notes:

Assessment of courses
Total number of evaluated students: 30

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Lecturer: JUDr. Mária Veterníková, PhD.

Date of the latest change: 05.04.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

University: University of Economics in Bratislava	

Faculty: Faculty of Economic Informatics	

Course code: KMA FHI/IIC21350/21	**Title of course:** Life Insurance

Type, load and method of teaching activities:
 Form of course: Lecture / Practical
 Recommended load of course (number of lessons):
 Per week: 2 / 2 **Per course:** 26 / 26
 Method of study: present

Number of credits: 6

Recommended semester/trimester of study: 3.

Degree of study: II.

Prerequisites:

Requirements to complete the course:
 The semester work and the written test – 30 %
 The final written test – 70 %

Student workload:
 Total study load (in hours): 156 hours
 26 hours participation in lectures
 26 hours participation in exercises
 26 hours preparing for exercises
 26 hours preparation for course credit
 52 hours individual study in preparation for the exam

Teaching results:
 Knowledge. The main educational goal of the course is to acquaint students with the methods of pricing in life insurance, actuarial analysis and reinsurance in life insurance in theory and in practice .Students should understand the methods of product pricing, they should have knowledge of methods for valuing assets, liabilities, surplus, solvency and reinsurance of life insurance.
 Skills. Graduates should be able to apply the acquired knowledge and skills and methods in practice and thus obtain the basic prerequisites for the work of an actuary, but also the risk manager in a life insurance company.
 Competences. Graduates should actively expand their actuarial knowledge and skills and thus acquire additional competencies for the work of an actuary and risk manager.

Indicative content:
 1. Life insurance contracts.
 2. Contract design. Pricing techniques.
 3. Profit testing. Profit criteria.
 4. Underwriting and extra risks.
 5. Pricing bases – mortality, interest rate, expenses, inflation, surrenders.
 6. Areas of risk and uncertainty. Actuarial investigations.
 7. Methods for valuing the assets and the liabilities. Earned asset shares.
 8. Methods of policyholder participation.
 9. Unit-linked contracts.
 10. Surrender values. Alterations. Mortality options. Financial guarantees.

11. Reinsurance.

12. The financial management of a life insurance company, ALM.

13. Market consistent embedded value. Investment strategy. Actuarial control cycle.

Support literature:

1. SAKÁLOVÁ, K. (2001). Oceňovanie produktov v životnom poistení. Bratislava : Ekonóm EUBA, 2001. 156. ISBN 80-225-1350-4.

2. SAKÁLOVÁ, K. (2006). Aktuárske analýzy. Bratislava : Ekonóm EUBA, 2006. 113. ISBN 80-225-2115-9.

3. DICKSON, D., C., M., HARDY, M., R., WATERS, H.,R. (2009). Actuarial Mathematics for Life Contingent Risk. Cambridge University Press, New York.

4. LIFE INSURANCE (1995). Subject F. Institute of Actuaries. Oxford.

5. OLIVIERI, A., PITACCO, E. (2015). Introduction to insurance mathematics: technical and financial features of risk transfers. New York: Springer.

6. ROTAR, V. I. (2014). Actuarial models: the mathematics of insurance (2nd ed.). Chapman and Hall/CRC.

Syllabus:

1. Life insurance contracts.

2. Contract design. Pricing techniques.

3. Profit testing. Profit criteria.

4. Underwriting and extra risks.

5. Pricing bases – mortality, interest rate, expenses, inflation, surrenders.

6. Areas of risk and uncertainty. Actuarial investigations.

7. Methods for valuing the assets and the liabilities. Earned asset shares.

8. Methods of policyholder participation.

9. Unit-linked contracts.

10. Surrender values. Alterations. Mortality options. Financial guarantees.

11. Reinsurance.

12. The financial management of a life insurance company, ALM.

13. Market consistent embedded value. Investment strategy. Actuarial control cycle.

Language whose command is required to complete the course:

slovak

Notes:

Assessment of courses

Total number of evaluated students: 19

A	B	C	D	E	FX
26.32	26.32	15.79	21.05	10.53	0.0

Lecturer: prof. RNDr. Katarína Sakálová, CSc.

Date of the latest change: 01.02.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

DESCRIPTION OF COURSE

University: University of Economics in Bratislava	

Faculty: Faculty of Economic Informatics	

Course code: KMA FHI/IIC22910/22	**Title of course:** Life and Non-life Insurance

Type, load and method of teaching activities:
  Form of course:
  Recommended load of course (number of lessons):
  Per week: Per course:
  Method of study: present

Number of credits: 10

Recommended semester/trimester of study:

Degree of study: II.

Prerequisites:

Requirements to complete the course:

Student workload:

Teaching results:

Indicative content:

Support literature:

Syllabus:

Language whose command is required to complete the course:

Notes:

Assessment of courses
 Total number of evaluated students: 8

A	B	C	D	E	FX
37.5	37.5	25.0	0.0	0.0	0.0

Lecturer:

Date of the latest change: 05.04.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

DESCRIPTION OF COURSE

University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KMA FHI/IIC21270/21	Title of course: Mathematics for Life Insurance I

Type, load and method of teaching activities:
 Form of course: Lecture / Practical
 Recommended load of course (number of lessons):
 Per week: 2 / 2 **Per course:** 26 / 26
 Method of study: present

Number of credits: 6

Recommended semester/trimester of study: 1.

Degree of study: II.

Prerequisites:

Requirements to complete the course:
 30 % activities in tutorials, completion of given tasks and passing of semester written work (written test),
 40 % written part of the exam,
 30 % oral part of the exam.

Student workload:
 Total study load (in hours): 156 hours
 26 hours attendance at lectures,
 26 hours participation in tutorials,
 26 hours preparation for tutorials,
 26 hours preparation for semester written work,
 56 hours preparation for exam.

Teaching results:
 The aim of the course is to master the mathematical methods and actuarial techniques used in life insurance.
 Knowledge
 On completing the course the student should understand the terminology and master the actuarial techniques used in both the deterministic discrete and continuous approach to insurances on single lives and on more than one life.
 Skills
 Based on the above knowledge, students will be able to value of the premium, the assured amount and the insurance reserve for life insurance products on one and on multiple lives.
 Competence
 The graduate of the course will obtain knowledge and skills that can be used in the study of Mathematics for Life Insurance II, so can be used knowledge of the issue of stochastic approach to modeling in life insurance.

Indicative content:
 .

Support literature:
 1. Sekerová, V., Bilíková, M. (2005). Poistná matematika. Bratislava : Ekonóm.

2. Bilíková, M., Johanesová, M. (2008). Aktuárske výpočty pre rôzne druhy poistenia m-tice osôb. Bratislava : Ekonóm.
3. Bilíková, M. (2003). Spojité metódy v poistnej matematike. Bratislava : Ekonóm.
4. Promislow, S. D. (2015). Fundamentals of Actuarial Mathematics. United Kingdom: John Wiley & Sons.
5. Dickson, D. C. M., Hardy, M. R. & Waters, H. R. (2009). Actuarial Mathematics for Life Contingent Risks. New York: Cambridge University Press.

Syllabus:
1. Actuarial basis, basic principles of life insurance, commutation functions, pure endowment, value of basic annuities.
2. Value of special annuities. Value of basic and special insurances on death, endowment assurance.
3. Regular net premium, insurance paid only regularly, generalised form of the relationship for calculating the net premium.
4. Gross premium. English and Germany approach to gross premium.
5. Net premium reserve, prospective and retrospective calculation of the net reserve. Risk and investment part of premium.
6. Zillmer reserve, reserve for expenses, gross premium reserve, surrender and alteration of policies. Surplus and profit of insurer.
7. Continuous methods in life insurance: force of mortality. Relationships between force of mortality and mortality table functions. Laws of mortality.
8. Level annuities paid m-times a year and their approximation. Continuous annuities.
9. Assurances paid immediately on death. Further continuous assurances. Approximation of continuous by discrete assurances. Continuous insurance reserves.
10. Insurance of more than one person, basic terms, joint lives. Complete intensity and joint-life insurances.
11. Law of equal aging. State to last death, state of exactly r lives alive, state of at least r lives alive - probability, insurances. Z-method.
12. Compound states. Time interval between deaths. Reversionary annuities.
13. Regular premiums and reserves for insurances on more than one life and reversionary annuities.

Language whose command is required to complete the course:
slovak

Notes:

Assessment of courses
Total number of evaluated students: 124

A	B	C	D	E	FX
18.55	15.32	23.39	19.35	20.97	2.42

Lecturer: Mgr. Ing. Ingrid Krčová, PhD.

Date of the latest change: 01.02.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof.

RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

DESCRIPTION OF COURSE

University: University of Economics in Bratislava	

Faculty: Faculty of Economic Informatics	

Course code: KMA FHI/IIC21280/21	**Title of course:** Mathematics for Life Insurance II

Type, load and method of teaching activities:
 Form of course: Lecture / Practical
 Recommended load of course (number of lessons):
 Per week: 2 / 2 **Per course:** 26 / 26
 Method of study: present

Number of credits: 5

Recommended semester/trimester of study: 2.

Degree of study: II.

Prerequisites:

Requirements to complete the course:
 The semester work - written test - 30%,
 Written part of the exam - 40%
 Oral part of the exam - 30%

Student workload:
 Total study load (in hours):
 Participation in lectures - 20
 Participation in exercises - 20
 Preparation for exercises – 20
 Preparation for the semester work - 20
 Preparation for the final exam - 50
 Total load - 130

Teaching results:
The aim of the course is to provide knowledge of the stochastic approach to modeling life insurance products. The valuation of premiums, reserves and life insurance risks is performed using appropriately selected functions of a random variable. The graduate of the course will obtain:
Knowledge and understanding
- knowledge of modeling risks, premiums and reserves in life insurance using the random variable function,
- knowledge of mortality models and modeling the mortality risk,
- knowledge of modeling the stochastic interest rate.
Skills
- students will be able to value insurance premiums and reserves based on a stochastic approach,
- students will be able to express the loss or profit of the insurance company and use it in actuarial calculations.
Competence
- knowledge and skills that can be used to expand knowledge of the issue of the stochastic approach to modeling in life insurance.

Indicative content:
 .

Support literature:
1. Šoltésová, T. (2019). Aktuárske modelovanie v životnom poistení. Bratislava: Vydavateľstvo Letra Edu.
2. Dickson, D. C. M., Hardy, M. R. & Waters, H. R. (2009). Actuarial Mathematics for Life Contingent Risks. New York: Cambridge University Press.
3. Olivieri, A., Pitacco, E. (2015). Introduction to insurance mathematics: technical and financial features of risk transfers. New York: Springer.
4. Promislow, S. D. (2014). Fundamentals of actuarial mathematics. John Wiley & Sons.

Syllabus:
1. Future lifetime random variable (RV) at birth, its basic functions.
Future lifetime RV for a life aged x, force of mortality, probability density, expectation of life.
2. The curate future lifetime. Definition of mortality tables based on the stochastic approach.
3. The fractional age assumptions for the future lifetime RV for a life aged x between integer ages.
4. Continuous insurances as functions of the future lifetime RV for a life aged x, their means and standard deviations.
5. Continuous annuities as functions of the future lifetime RV for a life aged x, their means and standard deviations.
6. Discrete insurances as functions of RV curtate future lifetime, their means and standard deviations.
7. Generalization of basic types of insurances and recurrent formulas in a stochastic approach.
8. The stochastic approach to life insurance on m lives: joint life, state to last death.
9. The stochastic approach to insurances on m lives: contingent insurances and reversionary annuities.
10. Future loss RV of an insurer from a specified policy and its use in actuarial calculations.
11. The using a stochastic approach to a calculation of premiums, various criteria for the calculation.
12. Reserves in a stochastic approach. The death strain, the profit from mortality.
13. Stochastic modeling of the mortality risk and the interest rate risk.

Language whose command is required to complete the course:
slovak

Notes:

Assessment of courses
Total number of evaluated students: 115

A	B	C	D	E	FX
13.04	16.52	18.26	27.83	20.87	3.48

Lecturer: doc. Mgr. Tatiana Šoltésová, PhD.

Date of the latest change: 01.02.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

DESCRIPTION OF COURSE

University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KMA FHI/IIC21290/21	Title of course: Non-life Insurance

Type, load and method of teaching activities:
Form of course: Lecture / Practical
Recommended load of course (number of lessons):
Per week: 2 / 2 Per course: 26 / 26
Method of study: present

Number of credits: 5

Recommended semester/trimester of study: 2.

Degree of study: II.

Prerequisites:

Requirements to complete the course:
30% exams (using software support)
20% oral final exam
50% written final exam (using software support)

Student workload:
Total study load (in hours): 130 hours
26 hours - participation in lectures,
26hours - participation in exercises,
13 hours - preparation for exercises, homeworks,
13 hours - preparation for written work,
52 hours - self-study in preparation for the exam.

Teaching results:
Students will gain theoretical and practical knowledge in the field of Non-life insurance, they will be able to define and analyze insurance industries, within P&C products. The students will expand their knowledge of mathematical statistics and probability and in addition to the theoretical basis of statistical analysis or predictive modeling they will learn modern practical applications in non-life insurance, such as tariff analysis or claim reserving, using statistical software R or Python. Knowledge 1. Identification and analysis of the insurance industry, within retail and commercial non-life insurance products 2. Understand the basic concepts, terminology and principles in non-life insurance 3. Acquisition of a solid mathematical basis and knowledge of procedures and mathematical-statistical methods applied in non-life insurance in the valuation of products and the estimation of technical provisions 4. Orientation in the basics of legislation in the field of non-life insurance Competences Based on the acquired knowledge, students are able to understand the statistical, mathematical, financial and IT procedures in insurance companies, administrative and regulatory bodies responsible for the supervision of P&C insurance. They will gain the ability to understand the practice and development of the insurance market not only in Slovakia but also the single market

within the European Union, including its legal basis. The acquired theoretical and practical skills are to the extent recommended by the International Society of Actuaries for Non-life Insurance. Skills

After completing the course, students can:
• use theoretical knowledge in data analysis in basic statistical models
• be familiar with the issue and apply appropriate procedures and models
• develop actuarial models and demonstrate an understanding of practical considerations and constraints related to tariff analysis and claim reserving
• use computational technology and statistical softwares (R/Python)
• clearly interpretation and presentation of the achieved results

Indicative content:
1. Non-life insurance classification, KPI in P&C industry.
2. Generalized linear methods (GLMs) - model structure, multiplicative model, parameter estimation, testing the significance of the model and the significance of individual parameters.
3. Diagnostics and model quality, model selection, deviance.
4. Predictive modeling using GLMs in tariff analysis, segmented risk model.
5. Bayesian statistics and Credibility Theory.
6. Empirical Bayesian Credibility Theory.
7. Bonus-Malus systems (BMS) and No-Claim Discount (NCD) systems.
8. Markov analysis and Poisson process.
9. Calculation of relative premium rate in BMS system, BMS efficiency.
10. Claim reserving, Deterministic claim reserving methods: Chain-ladder, Inflation-adjusted Chain-ladder.
11. Deterministic methods for calculating technical provisions for claims: Arithmetic separation method, geometric separation method, Bornhuetter-Ferguson, Cape-Code.
12. Stochastic claim reserving methods.
13. Non-life insurance in Solvency II.

Support literature:
1. Denuit, Michel, et al.: Actuarial Modelling of Claim Counts: Risk Classification, Credibility and Bonus-Malus Systems. West Sussex : John Wiley & Sons, Inc., 2007.
2. Klugman, Stuart A., Panjer, Harry H., Willmot, Gordon E.: Loss Models: From Data to Decisions. 4th Edition. New Jersey: John Wiley & Sons, Inc., 2012.
3. Boland, P. J.: Statistical and Probabilistic methods in Actuarial Science, 2007.
4. Ohlsson, E., Johansson, B.: Non-Life Insurance Pricing with Generalized Linear Models. Berlín: Springer Nature Switzerland AG, 2010.
5. Pacáková, V.: Aplikovaná poistná štatistika. Bratislava: Elita, 2004
6. Cipra, T.: Riziko ve financích a pojišťovnictví: Basel III a Solvency II, 2015.
7. Zákon č. 39/2015 Z. z. (Zákon o poisťovníctve).
8. Charpentier, A.: Computation actuarial science with R. Taylor & Francis Group. 2015.
9. Strežo, M., Mucha, V., Šoltés, E., Páleš, M. Risk Premium Prediction of Motor Hull Insurance Using Generalized Linear Models. In Statistika : Statistics and Economy Journal. - Praha : Český statistický úřad, 2019, vol. 99, no. 4

Syllabus:
1. Non-life insurance classification, KPI in P&C industry.
2. Generalized linear methods (GLMs) - model structure, multiplicative model, parameter estimation, testing the significance of the model and the significance of individual parameters.
3. Diagnostics and model quality, model selection, deviance.
4. Predictive modeling using GLMs in tariff analysis, segmented risk model.
5. Bayesian statistics and Credibility Theory.

6. Empirical Bayesian Credibility Theory.
7. Bonus-Malus systems (BMS) and No-Claim Discount (NCD) systems.
8. Markov analysis and Poisson process.
9. Calculation of relative premium rate in BMS system, BMS efficiency.
10. Claim reserving, Deterministic claim reserving methods: Chain-ladder, Inflation-adjusted Chain-ladder.
11. Deterministic methods for calculating technical provisions for claims: Arithmetic separation method, geometric separation method, Bornhuetter-Ferguson, Cape-Code.
12. Stochastic claim reserving methods.
13. Non-life insurance in Solvency II.

Language whose command is required to complete the course:
slovak

Notes:

Assessment of courses
Total number of evaluated students: 113

A	B	C	D	E	FX
13.27	28.32	16.81	21.24	19.47	0.88

Lecturer: doc. Mgr. Vladimír Mucha, PhD., Ing. Lenka Smažáková, PhD.

Date of the latest change: 01.02.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

<div align="center">**DESCRIPTION OF COURSE**</div>

University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KMA FHI/IIC21300/21	**Title of course:** Pension and Health Insurance

Type, load and method of teaching activities: **Form of course:** Lecture / Practical **Recommended load of course (number of lessons):** **Per week:** 2 / 2 **Per course:** 26 / 26 **Method of study:** present

Number of credits: 6

Recommended semester/trimester of study: 3.

Degree of study: II.

Prerequisites:

Requirements to complete the course: 30% semester written work, 70% written exam.

Student workload: Total study load (in hours): 156 hours 26 hours of lectures, 26 hours of exercise, 70 hours of self-study in preparation for the exam, 17 hours preparation for seminars, 17 hours preparation for semester written work.

Teaching results: Completion of the course Pension and sickness insurance presupposes the science of analyze of actuarial methods and modelling in pension, health and sickness insurance. Knowledge The subject offers a new knowledge of actuarial science and technique of actuarial calculations in continuity with exploitation in actuarial profession. In this calculations there are need to demonstrate on skills of students suitable use actuarial models and insurance-mathematical methods. Competences Based on the above knowledge, students are able to comment on the calculations of benefits in miscellaneous pensions schemes and in calculations of benefits and contributions in sickness insurance by use of deterministic models and with modelling of premium magnitude by Markov chains. Skills As part of the educational process, they will acquire such skills that will enable students to apply in social security. They will be evaluate assets of company and to advise to management financial strategy like future actuaries, too. They expressive will be contribute to the improvement of products of insurance company.

Indicative content: 1. Pension insurance – introduction. Defined contribution pension plans, defined benefit pension plans.

2. Funding and unfunding pension plans. Pension benefits and their calculation.

3. Pensions not dependent on salary. Old-age retirement and ill-health pension.

4. Pensions dependent on salary (average or final). Calculation of level of contributions. Assignation of level of assets, future benefits and future contributions.

5. Lump sum on death. Funding methods: entry age method, attained age method, current unit method, projected unit method.

6. Initial values in pension insurance. Widows and orphan pension.

7. Estimation theory for pension schemes.

8. Miscellaneous topics in health and sickness insurance. Introduction in actuarial calculations.

9. General fields of risk and indefiniteness in health and sickness insurance.

10. Annual rate of sickness, central rate of sickness, force of sickness. Assumptions of valuation of products in sickness insurance.

11. Premium calculation in sickness insurance. Commutation functions in sickness insurance. Methods of valuation of obligations. Transition probabilities and intensities . Sickness-death model.

12. Multiple-decrement models in sickness insurance. Markov homogeneous and not homogeneous time chains with ultimate space for time-continuous model.

13. Constructions of the differential equations for transition probabilities. The use of differential equations in sickness and health insurance today. Multiple decrement models.

Support literature:

[1] Škrovánková, L., Simonka, Z.: Aktuárske metódy a modely v penzijnom, zdravotnom a nemocenskom poistení. H.R.G. spol. s.r.o., www.TiskovyExpress.cz 2021.

[2] Škrovánková, L.: Zdravotné a nemocenské poistenie. Bratislava: Ekonóm, 2013

[3] Škrovánková, L., Škrovánková, P.: Dôchodkové poistenie. Bratislava: Ekonóm, 2015.

[4] Booth, P., Chadburn, R., Haberman, S.: Modern Actuarial Theory and Practice. London: Chapman and Hall, 2004.

[5] Cipra, T.: Pojistná matematika: teorie a praxe. Praha: Edice Ekopress, 1999.

[6] Formulae and Tables for Examinations of the Faculty of Actuaries and the Institute of Actuaries. Cambridge: 2002.

Syllabus:

1. Pension insurance – introduction. Defined contribution pension plans, defined benefit pension plans.

2. Funding and unfunding pension plans. Pension benefits and their calculation.

3. Pensions not dependent on salary. Old-age retirement and ill-health pension.

4. Pensions dependent on salary (average or final). Calculation of level of contributions. Assignation of level of assets, future benefits and future contributions.

5. Lump sum on death. Funding methods: entry age method, attained age method, current unit method, projected unit method.

6. Initial values in pension insurance. Widows and orphan pension.

7. Estimation theory for pension schemes.

8. Miscellaneous topics in health and sickness insurance. Introduction in actuarial calculations.

9. General fields of risk and indefiniteness in health and sickness insurance.

10. Annual rate of sickness, central rate of sickness, force of sickness. Assumptions of valuation of products in sickness insurance.

11. Premium calculation in sickness insurance. Commutation functions in sickness insurance. Methods of valuation of obligations. Transition probabilities and intensities . Sickness-death model.

12. Multiple-decrement models in sickness insurance. Markov homogeneous and not homogeneous time chains with ultimate space for time-continuous model.

13. Constructions of the differential equations for transition probabilities. The use of differential equations in sickness and health insurance today. Multiple decrement models.

Language whose command is required to complete the course:
slovak

Notes:

Assessment of courses
Total number of evaluated students: 19

A	B	C	D	E	FX
57.89	26.32	15.79	0.0	0.0	0.0

Lecturer: doc. RNDr. Lea Škrovánková, PhD., PaedDr. Zsolt Simonka, PhD.

Date of the latest change: 01.02.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

DESCRIPTION OF COURSE

University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KMA FHI/IIC21200/21	Title of course: Predictive Models in Actuarial Science

Type, load and method of teaching activities: Form of course: Lecture / Practical Recommended load of course (number of lessons): Per week: 2 / 2 Per course: 26 / 26 Method of study: present

Number of credits: 5

Recommended semester/trimester of study: 1.

Degree of study: II.

Prerequisites:

Requirements to complete the course: 30% exams (using software support) 20% oral final exam 50% written final exam (using software support)

Student workload: Total study load (in hours): 130 hours 26 hours - participation in lectures, 26 hours - participation in exercises, 26 hours - preparation for exercises, homeworks, 10 hours - preparation for written work, 42 hours - self-study in preparation for the exam.

Teaching results: Students will gain the ability to mathematically analyze the properties of linear and nonlinear regression models and apply their knowledge in specific economic and actuarial problems. This course also deals with the use of the generalized least squares method in the case of autocorrelation or heteroskedasticity as well as the estimation of nonlinear regression models. Demonstration of applications in R language is an integral part of this course. Knowledge 1. The use of Exploratory Data Analysis (EDA) for the summary statistics and visualization of data, or the search for hypotheses about the causes of the observed phenomenon 2. Using Linear, resp. Nonlinear regression models to fit the causal dependence of statistical variables 3. Selection of the optimal set of relevant predictors 4. Verify the assumptions of the selected regression model and apply appropriate procedures in case of their violation 5. Diagnosis of relationships between covariates in a regression model 6. Determine the presence of multicollinearity and influential observations and apply appropriate procedures to eliminate them Competences Based on the above knowledge, students will work effectively with data. They propose optimal regression model, by which they describe the causal relationship between two or more variables

and explain as much of the variability of the explained variable as possible by its relationship with another explanatory variable.
Skills
After completing the course, students will gain:
• define the assumptions of linear, resp. nonlinear regression model and their importance in the correct performance of regression analysis
• understand the geometric interpretation of regression models
• be able to estimate unknown parameters in regression models
• verify modeling assumptions using formal tests and visual diagnostic tools
• deduce conclusions about regression models
• be able to fundamentally create and verify regression models
• correctly interpret the results achieved in a comprehensible and clear form
• apply the above knowledge and techniques based on their own data with the support of computational programming

Indicative content:

Introduction to Regression and Correlation analysis, regression models and their types. Use in actuarial science. Basic Linear Model theorem, estimation of Linear Model parameters using least squares method and geometry of regression models, estimator, Gauss-Markov theorem. Testing the statistical significance of the regression model and the contribution of explanatory variables, F-distribution, decomposition of the sum of squares. Theoretical and computational aspects of statistical inference about Linear Model parameters. Prediction vs explanation, causality concept, designed data vs observed data, matching. Correlation analysis. Simple correlation characteristics and inductive judgments about them. Multiple and partial correlation characteristics Quality of regression model, multicollinearity, methods of selection of explanatory variables, criteria methods - consistency vs. efficiency. Projection matrix, Model residuals, Diagnostics of influential observations: outliers, Cook statistics. Verification of assumptions about the random component of Linear Model, graphical analysis of residues, verification of homoskedasticity. Diagnostics - assumptions about random errors. Generalized least squares method, Generalized Linear Models – GLMs. Nonlinear models and algorithms for finding local minima in the least squares method, Gauss-Newton and related methods.

Support literature:

1. Frees, E. W., Derrig, R., Mayers, G.: Predictive Modeling Applications in Actuarial Science: Volume 1, Predictive Modeling Techniques. Cambridge University Press, 2014
2. Frees, W., E.: Regression Modeling with Actuarial and Financial Applications. Cambridge University Press, 2010
3. De Jong, P., Heller, G. Z.: Generalized Linears Models for Insurance Data. Cambridge: Cambridge University Press, 2008
4. Faraway, J.: Linear Models with R, second edition, CRC press, 2014
5. Šoltés, E.: Regresná a korelačná analýza s aplikáciami v softvéri SAS. Bratislava: IURA Edition, 2019
6. Agresti, A: Foundations of Linear and Generalized Linear Models. John Wiley & Sons, 2015
7. Hastie, T., Tibshirani, R., Friedman, J.: The elements of Statistical Learning, 2017
8. James, G., Witten D., Hastie T., Tibshirani R.: An introduction to statistical learning with applications in R, Springer, 2013
9. Crawley, Michael J.: "Statistical modelling." The R Book, Second Edition, 2007
10. Pázman, A., Lacko, V.: Prednášky z regresných modelov: Odhadovanie parametrov strednej hodnoty a štatistická optimalizácia experimentu, Bratislava Univerzita Komenského, 2012

11. Škrovánková, L., Révészová, L. Some applications of statistical information theory. In Creative Mathematics and Informatics. Department of Mathematics and Computer Science North University of Baia Mare. Baia Mare, 2006.

Syllabus:
1. Introduction to Regression and Correlation analysis, regression models and their types. Use in actuarial science.
2. Basic Linear Model theorem, estimation of Linear Model parameters using least squares method and geometry of regression models, estimator, Gauss-Markov theorem
3. Testing the statistical significance of the regression model and the contribution of explanatory variables, F-distribution, decomposition of the sum of squares
4. Theoretical and computational aspects of statistical inference about Linear Model parameters
5. Prediction vs explanation, causality concept, designed data vs observed data, matching
6. Correlation analysis. Simple correlation characteristics and inductive judgments about them
7. Multiple and partial correlation characteristics
8. Quality of regression model, multicollinearity, methods of selection of explanatory variables, criteria methods - consistency vs. efficiency
9. Projection matrix, Model residuals, Diagnostics of influential observations: outliers, Cook statistics
10. Verification of assumptions about the random component of Linear Model, graphical analysis of residues, verification of homoskedasticity
11. Diagnostics - assumptions about random errors
12. Generalized least squares method, Generalized Linear Models – GLMs.
13. Nonlinear models and algorithms for finding local minima in the least squares method, Gauss-Newton and related methods.

Language whose command is required to complete the course:
slovak

Notes:

Assessment of courses
Total number of evaluated students: 41

A	B	C	D	E	FX
17.07	19.51	26.83	9.76	26.83	0.0

Lecturer: doc. Ing. Michal Páleš, PhD.

Date of the latest change: 01.02.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

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DESCRIPTION OF COURSE

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University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KMA FHI/IIC21320/21	**Title of course:** Probability Theory II

Type, load and method of teaching activities: **Form of course:** Lecture / Practical   **Recommended load of course (number of lessons):**   **Per week:** 2 / 2 **Per course:** 26 / 26   **Method of study:** present

Number of credits: 5

Recommended semester/trimester of study: 3.

Degree of study: II.

Prerequisites:

Requirements to complete the course: 30% 2 written works (using software support),   70% written exam (using software support)

Student workload: Total study load (in hours): 156 hours   26 hours - participation in lectures,   26 hours - participation in exercises,   16 hours - preparation for exercises, homeworks,   20 hours - preparation for written works,   42 hours - self-study in preparation for the exam.

Teaching results: By completing the course Probability Theory II, students will expand their knowledge of one-dimensional probability distributions of random variables. They will gain knowledge about the apparatus for calculating probabilities and numerical characteristics (even conditional) in the case of two-dimensional distributions. They can use in the second part of the course, in which they will deal with the issue of determining the joint distribution using a copula functions. This appropriately captures the possible dependence of marginal random variables. Using R language software support, resp. MS Excel will also be able to simulate values from these distributions, which they can use in solving various problems in the field of actuarial services, such as in the aggregation of risks.   Knowledge   Students will gain knowledge about two-dimensional probability distributions, their characteristics, and the use of generating values from these distributions. They will also gain knowledge about determining the distribution of the sum of random variables. At the same time, they will have knowledge of the problem of modeling two-dimensional distributions of random variables using a copula functions.   Competences   Based on the acquired knowledge, students will have the competence to select a suitable approach for the implementation of probabilistic calculations, as well as to assess the dependence of random variables. They will be able to evaluate the selection of a suitable copula function for modeling data from a data file.   Skills

After completing the course, students can:
• perform probabilistic calculations,
• determine the dependence between random variables,
• implement and use the generation of values of two-dimensional random variables in solving problems,
• implement various graphic outputs and interpretations,
• use computer technology and software support (R language, MS Excel),
• implement aggregation of random variables using copula functions.

Indicative content:
1. The concept of multidimensional random variable. Marginal distribution of variables. Joint probability mass function and joint cumulative distribution function of a discrete two-dimensional random variable.
2. Joint probability density function and joint cumulative distribution function of a continuous two-dimensional random variable.
3. Laws of conditional distributions of two-dimensional random variable. Dependence of random variables, covariance and correlation. Graphic interpretation.
4. Numerical characteristics of conditional distributions of a two-dimensional random variable.
5. Generating functions of marginal random variables, convolution, Laplace transform.
6. Distribution of the sum of two marginal random variables and its characteristics.
7. Two-dimensional normal and t distribution. Generating their values. Visualization in the R language environment.
8. Copula functions. Properties of copula functions. Sklar's theorem. Survival copula.
9. Dependency measures (Pearson correlation coefficient, Kendall and Spearman rank correlation coefficient) and tail dependence.
10. Classification of copula functions. Elementary copulas (independent, comonotonic), Implicit copulas(Gaussian, Student's), Archimedean copulas(Clayton's, Frank's, Gumbel's) and others.
11. Calibration of the copula function. Parametric and nonparametric estimation of parameters. Verification of the selection of a suitable copula function.
12. Simulation of copula functions, generation of two-dimensional distribution values using copula functions, their visualization using scatterplot.
13. Use of copula functions in aggregation of two marginal random variables.

Support literature:
1. Fecenko, J.: Teória pravdepodobnosti II v Maxime. Letra Edu. 2018.
2. Ruppert, D., Matteson S., D.: Statistics and Data Analysis for Financial Engineering with R examples. Springer. 2015.
3. Everitt, B., Hothorn, T.: An Introduction to Applied Multivariate Analysis with R. Springer. 2011.
4. Hofert, M., Kojadinovic, I., Mächler, M., & Yan,J.: Elements of copula modeling with R. Springer. 2018.
5. Devore, L.,J.: Probability & Statistics for Engineering and the Sciences. Brooks/Cole. 2012.
6. Charpentier, A.: Computation actuarial science with R. Taylor & Francis Group. 2015.
7. Joe, H.: Dependence Modeling with Copulas. Taylor & Francis Group, LLC. 2015.
8. Škrovánková, L., Simonka, Z. Aktuárske metódy a modely v penzijnom, zdravotnom a nemocenskom poistení. Brno : H.R.G., 2021.

Syllabus:
1. The concept of multidimensional random variable. Marginal distribution of variables.
Joint probability mass function and joint cumulative distribution function of a discrete two-dimensional random variable.

2. Joint probability density function and joint cumulative distribution function of a continuous two-dimensional random variable.
3. Laws of conditional distributions of two-dimensional random variable. Dependence of random variables, covariance and correlation. Graphic interpretation.
4. Numerical characteristics of conditional distributions of a two-dimensional random variable.
5. Generating functions of marginal random variables, convolution, Laplace transform.
6. Distribution of the sum of two marginal random variables and its characteristics.
7. Two-dimensional normal and t distribution. Generating their values. Visualization in the R language environment.
8. Copula functions. Properties of copula functions. Sklar's theorem. Survival copula.
9. Dependency measures (Pearson correlation coefficient, Kendall and Spearman rank correlation coefficient) and tail dependence.
10. Classification of copula functions. Elementary copulas (independent, comonotonic), Implicit copulas(Gaussian, Student's), Archimedean copulas(Clayton's, Frank's, Gumbel's) and others.
11. Calibration of the copula function. Parametric and nonparametric estimation of parameters. Verification of the selection of a suitable copula function.
12. Simulation of copula functions, generation of two-dimensional distribution values using copula functions, their visualization using scatterplot.
13. Use of copula functions in aggregation of two marginal random variables.

| **Language whose command is required to complete the course:** |
| slovak |

| **Notes:** |

| **Assessment of courses** |
| Total number of evaluated students: 9 |

A	B	C	D	E	FX
55.56	33.33	11.11	0.0	0.0	0.0

| **Lecturer:** doc. Mgr. Vladimír Mucha, PhD., RNDr. Anna Strešňáková, PhD. |

| **Date of the latest change:** 01.02.2022 |

| **Approved by:** Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD. |

DESCRIPTION OF COURSE

University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KŠ FHI/IID22130/21	Title of course: Regression and Correlation Analysis

Type, load and method of teaching activities:
Form of course: Lecture / Practical
Recommended load of course (number of lessons):
Per week: 2 / 2 Per course: 26 / 26
Method of study: present

Number of credits: 6

Recommended semester/trimester of study: 3.

Degree of study: II.

Prerequisites:

Requirements to complete the course:
20 % assignments (2 assignments)
20 % semester project processed in SAS Enterprise Guide
60 % final exam (25% theoretical part, 35% practical part)

Student workload:
Total study load (in hours): 156 hours
Distribution of study load
Lectures participation: 26 hours
Seminar participation: 26 hours
Preparation for seminars: 26 hours
Preparation for assignments: 26 hours
Elaboration of semester project: 26 hours
Preparation for final exam: 26 hours

Teaching results:
After successful completion of this class, students will be able to analyze the relationships between statistical variables through multiple regression and correlation analysis. In particular, students will acquire the following abilities: − Students will acquire knowledge about the concepts, principles, methods and procedures used in multiple regression and correlation analysis. − Students will acquire knowledge about the procedures and methods to verify assumptions of a random error term in a regression, about the consequences of violating these assumptions and about solving such problems. − Students will understand the connection between regression analysis methods and correlation analysis methods. − Students will acquire in particular the following skills: − Students will be able to perform calculations for the relevant statistical procedures, both by their own calculations (especially with the use of matrix calculus), as well as with the use of professional statistical software SAS. − Students will learn to adequately apply the procedures and methods of regression and correlation analysis and correctly interpret the results.

− They will have the ability of critical thinking in distinguishing between causal and spurious relationship and in selecting of predictors.

Indicative content:
The course Regression and correlation analysis provides students with comprehensive knowledge and skills in the field of multiple regression analysis and correlation analysis, which are among the most commonly used statistical methods in the field of economics and management, both in practice and in research.

Support literature:
1. Šoltés, E. (2019). Regresná a korelačná analýza s aplikáciami v softvéri SAS. Bratislava: Letra Edu.
2. Šoltés, E. (2020). Regresná a korelačná analýza s aplikáciami v softvéri SAS – zbierka príkladov. Bratislava: Letra Edu.
3. SAS Institute Inc. (2017). The REG Procedure. In SAS/STAT®14.3 User's Guide. Cary, NC: SAS Institute Inc.
4. Wooldridge, J. M. (2013). Introductory Econometrics: A Modern Approach (5th ed.). Mason: South-Western.
5. Hebák, P., Hustopecký, J., Malá, I. (2005). Vícerozměrné statistické metody (2). Praha: Informatorium.
6. Darlington, R. B., Hayes, A. F. (2016). Regression Analysis and Linear Models: Concepts, Applications and Implementation. Guilford Publications.
7. Fox, J. (2015). Applied Regression Analysis and Generalized Linear Models. Sage Publications.
8. Belsley, D. A., Kuh, E., Welsh, R. E. (1980). Regression Diagnostics: Identifying Influential Data and Sources of Collinearity. New York: John Wiley & Sons, Inc.
9. MacKinnon, J. G. – White, H. (1985). Some Heteroskedasticity-Consistent Covariance Matrix Estimators with Improved Finite Sample Properties. Journal of econometrics, 29(3), 305-325.
Literature will be continuously updated with the latest scientific and professional titles.

Syllabus:
1. Introduction to multiple regression and correlation analysis. Classical linear regression model (CLRM). Ordinary least squares estimates.
2. Overall significance of a regression and an individual contribution of explanatory variables.
3. Statistical inference for parameters of CLRM. Predictions. Confidence interval for an individual prediction and confidence interval for the expected value (mean) of the dependent variable.
4. Correlation analysis. Simple correlation (including statistical inference).
5. Multiple, partial and semi-partial correlation (including statistical inference).
6. Collinearity diagnostics.
7. Model selection methods.
8. Influence diagnostics.
9. Graphical analysis of residuals. Assumption of homoskedasticity - its verification, consequences of its violation and solution of this problem.
10. Assumption of independence and assumption of normal distribution of error term - their verification, consequences of their violation and solution of these problems.
11. Generalized linear regression model.
12. Estimation of nonlinear regression models.
13. Summary.

Language whose command is required to complete the course:
Slovak

Notes:					
Assessment of courses Total number of evaluated students: 230					
A	B	C	D	E	FX
18.7	20.43	20.87	21.74	13.04	5.22

Lecturer: prof. Mgr. Erik Šoltés, PhD.

Date of the latest change: 07.02.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

DESCRIPTION OF COURSE

University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KMA FHI/IIC21330/21	Title of course: Risk Theory in Insurance I

Type, load and method of teaching activities:
Form of course: Lecture / Practical
Recommended load of course (number of lessons):
Per week: 2 / 2 Per course: 26 / 26
Method of study: present

Number of credits: 5

Recommended semester/trimester of study: 2.

Degree of study: II.

Prerequisites:

Requirements to complete the course:
30% 2 written works (using software support),
70% written exam (using software support)

Student workload:
Total study load (in hours): 130 hours
26 hours - participation in lectures,
26 hours - participation in exercises,
13 hours - preparation for exercises, homeworks,
26 hours - preparation for written works,
52 hours - self-study in preparation for the exam.

Teaching results:
After completing the course Risk theory in Insurance I, it is assumed that students acquire knowledge and skills in the field of insurance risk management through their own assessment, which can be used in partial internal models of insurance companies. Thanks to the software support of the R language and the Monte Carlo simulation method, they will also be able to handle stochastic risk modeling, which they will use to create various studies for actuarial analyzes.
Knowledge
Students will gain knowledge:
1. on stochastic measurement and risk management through risk measures,
2. on statistical techniques for estimating probability distributions from available data sets,
3. on the analysis of light and heavy tails of distributions,
4. on modeling extreme values using the Excess over Threshold method,
5. on modeling two-dimensional distributions using a copula functions that can be applied in risk aggregation,
6. on the collective and on the individual risk model, within the created partial internal model they will have knowledge of the methods of determining the distribution of total damage and calculations related to risk management.
Competences
Based on the above knowledge, students are able to assess and measure risk in a partial internal model within the acquired competencies. Based on the evaluation of input parameters, they can choose a suitable solution approach to modeling the analyzed issues. Students will be competent

in interpreting the results obtained from modeling in connection with the measurement and management of risks.
Skills
After completing the course, students can:
• estimate probability distributions from data files,
• implement various statistical approaches and methods,
• implement the Excess over Threshold method,
• implement risk aggregation using a copula functions,
• implement a Monte Carlo simulation method to generate values of random variables,
• determine risk measures using different solution approaches depending on the analyzed situation,
• perform various graphical interpretations and calculations,
• use computer technology and software support (R language, MS Excel),
• orientate in the given issue and apply appropriate procedures.

Indicative content:
1. Introduction to risk theory. Risk measurement: a stochastic approach. Risk functions and risk measures (survival function, hazard rate function, mean excess loss function, value at risk, expected shortfall, or conditional value at risk).
2. Creation of probabilistic risk models (data visualization: histogram, boxplot, QQ plot, Cullen - Frey graph, kernel probability density estimation, parameter estimation, goodness-of-fit tests (Pearson's chi-square, Kolmogorov-Smirnov, Anderson-Darling and Cramer von Mises test), creating m-component distributions (splicing).
3. Basic knowledge from survival analysis (nonparametric estimation: for example Kaplan-Meier). Analysis of light and heavy tail of distributions.
4. Basic knowledge of the extrem value theory. Excess over Threshold (EOT) method. Determining the threshold value. Estimation of parameters of generalized Pareto distribution.
5. Estimation of value at risk, expected shortfall using the EOT method.
6. Copula functions. Sklar's theorem. Survival copula. Dependency measures. Tail dependence. Selected types of copula functions.
7. Estimation of copula function parameters and selection of a suitable copula function. Simulation of two-dimensional random variable values using the copula function.
8. Risk aggregation methods. Aggregation by addition. Risk aggregation using copula function. Determining the value at risk and expected shortfall of aggregated risks using a copula function.
9. Compound distribution of a random variable, collective risk model (CRM), methods for determining the distribution of total claims, simulation of its values using the Monte Carlo method.
10. Compound distributions: recurrent (Panjer's relation) and approximate approach (approximation by normal and shifted gamma distributions) to determine the distribution of total claims.
11. Determination of economic capital by value at risk and expected shortfall methodology in case of distribution of total claims in CRM.
12. Surplus model. Determination of risk measures value at risk, expected shortfall and economic capital in case of a distribution of the surplus.
13. Individual risk model (IMR). Determination of the distribution of total claims by the Monte Carlo method. Approximation of IMR by composing compound Poisson distributions

Support literature:
1. Horáková, G., Páleš, M. & Slaninka, F.: Teória rizika v poistení. Wolters Kluwer. 2015.
2. Cipra, T. Riziko ve financích a pojišťovnictví: Basel III a Solvency II. Praha: Ekopress. 2015
3. Kaas, R., Goovaerts, M., Dhaene, J., Denuit, M.: Modern actuarial risk theory using R, Berlin: Springer. 2008.
4. Klugman, S., A.,Panjer, H. H., & Willmot, G. E.: Loss Models (From Data to Decision). New York: John Wiley. Sons. 2012.

5. Páleš, M.: Jazyk R pre aktuárov. Bratislava, Letra Edu. 2019.
6. Coles, S.: An Introduction to Statistical Modeling of Extreme Values.Springer. 2001
7. Moore, F., D.: Applied survival analysis using R. Springer. 2016.
8. Charpentier, A.: Computation actuarial science with R. Taylor & Francis Group. 2015.
9. Mucha, V., Páleš, P..: Teória pravdepodobnosti pre ekonómov. S podporou jazyka R. Letra Edu. 2018.
10. Hofert, M., Kojadinovic, I., Mächler, M., & Yan,J.: Elements of copula modeling with R. Springer. 2018.
11. Ruppert, D., Matteson S., D.: Statistics and Data Analysis for Financial Engineering with R examples. Springer. 2015.
12. Markovich, N.: Nonparametric Analysis of Univariate Heavy-Tail Data. John Wiley Sons. 2007.
13. Mucha, V. Applying Simulations in the Individual Risk Model Using R. In Managing and Modelling of Financial Risks. Proceedings of 9th International Scientific Conference : VŠB - Technical University of Ostrava, 2018.
14. Mucha, V., Páleš, M., Sakálová, K. Calculation of the capital requirement using the Monte Carlo simulation for non-life. In Ekonomický časopis. Bratislava : Ekonomický ústav SAV : Prognostický ústav SAV, 2016, roč. 64, č. 9.

Syllabus:
1. Introduction to risk theory. Risk measurement: a stochastic approach. Risk functions and risk measures (survival function, hazard rate function, mean excess loss function, value at risk, expected shortfall, or conditional value at risk).
2. Creation of probabilistic risk models (data visualization: histogram, boxplot, QQ plot, Cullen - Frey graph, kernel probability density estimation, parameter estimation, goodness-of-fit tests (Pearson's chi-square, Kolmogorov-Smirnov, Anderson-Darling and Cramer von Mises test), creating m-component distributions (splicing).
3. Basic knowledge from survival analysis (nonparametric estimation: for example Kaplan-Meier). Analysis of light and heavy tail of distributions.
4. Basic knowledge of the extrem value theory. Excess over Threshold (EOT) method. Determining the threshold value. Estimation of parameters of generalized Pareto distribution.
5. Estimation of value at risk, expected shortfall using the EOT method.
6. Copula functions. Sklar's theorem. Survival copula. Dependency measures. Tail dependence. Selected types of copula functions.
7. Estimation of copula function parameters and selection of a suitable copula function. Simulation of two-dimensional random variable values using the copula function.
8. Risk aggregation methods. Aggregation by addition. Risk aggregation using copula function. Determining the value at risk and expected shortfall of aggregated risks using a copula function.
9. Compound distribution of a random variable, collective risk model (CRM), methods for determining the distribution of total claims, simulation of its values using the Monte Carlo method.
10. Compound distributions: recurrent (Panjer's relation) and approximate approach (approximation by normal and shifted gamma distributions) to determine the distribution of total claims.
11. Determination of economic capital by value at risk and expected shortfall methodology in case of distribution of total claims in CRM.
12. Surplus model. Determination of risk measures value at risk, expected shortfall and economic capital in case of a distribution of the surplus.
13. Individual risk model (IMR). Determination of the distribution of total claims by the Monte Carlo method. Approximation of IMR by composing compound Poisson distributions

| **Language whose command is required to complete the course:** |
| slovak |

| **Notes:** |

Assessment of courses
 Total number of evaluated students: 113

A	B	C	D	E	FX
13.27	15.04	26.55	29.2	14.16	1.77

| **Lecturer:** doc. Mgr. Vladimír Mucha, PhD. |

| **Date of the latest change:** 01.02.2022 |

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KMA FHI/IIC21340/21	**Title of course:** Risk Theory in Insurance II

Type, load and method of teaching activities:
 Form of course: Lecture / Practical
 Recommended load of course (number of lessons):
 Per week: 2 / 2 **Per course:** 26 / 26
 Method of study: present

Number of credits: 6

Recommended semester/trimester of study: 3.

Degree of study: II.

Prerequisites:

Requirements to complete the course:
 30% 2 written works (using software support),
 70% written exam (using software support)

Student workload:
 Total study load (in hours): 156 hours
 26 hours - participation in lectures,
 26 hours - participation in exercises,
 26 hours - preparation for exercises, homeworks,
 20 hours - preparation for written works,
 58 hours - self-study in preparation for the exam.

Teaching results:
After completing the course Risk theory in Insurance II, it is assumed that students will acquire knowledge and skills in the field of insurance risk management through their transfer in the application of forms of insurance and types of reinsurance. Thanks to the software support of the R language and the Monte Carlo simulation method, they will also be able to handle stochastic modeling of the total insurance and reinsurance benefit and the measurement of the given risk reduction effect. Furthermore, they will gain knowledge and skills in estimating the probability of ruin using modeling of a compound Poisson process in a collective risk model for longer time periods.
Knowledge
Students will gain knowledge:
1. on forms of insurance and types of reinsurance in the context of their use in risk management,
2. on the modeling of the total claim amount paid by the insurer and reinsurer within the collective risk model based on the Monte Carlo method,
3. the reinsurer's limit and the choice of appropriate optimal reinsurance protection,
4. on stochastic processes (Poisson and Wiener process) within the estimation of the probability of ruin in a collective risk model for longer time periods.
Competences
On the basis of the above knowledge, students are able to decide, within the acquired competencies, on the selection of a suitable implementation of risk transfer to the insured or reinsurance company and evaluate it through risk measures. They will be able to comment on the setting of input

parameters in the modeled studies so that this step is reflected in the required outputs. Students will be competent in the selection of a suitable solution approach, in the interpretation of the achieved results and in the evaluation of model causality..

Skills

After completing the course, students can:
• implement stochastic modeling using Monte Carlo simulations,
• also perform various graphical interpretations and calculations,
• select a suitable reinsurance protection,
• use computer technology and software support (R language, MS Excel, mathematical software),
• orientate in the ruin theory and apply appropriate procedures,
• measure risk reduction after the application of insurance and reinsurance.

Indicative content:

1. Forms of insurance with supplementary forms of insurance (Pure indemnity insurance, First loss insurance, Insurance with an average clause, Quota insurance, With and without an excess).
2. Risk management by applying various forms of insurance in a collective risk model.
3. Modeling of the total claim amount paid by the insurer by Monte Carlo simulations and measurement of risk reduction using risk measures.
4. Reinsurance. Types of reinsurance. Proportional reinsurance (quota, excess reinsurance with respect to the sum insured (surplus)). Non-proportional reinsurance (excess reinsurance with respect to the amount of claims (WXL / R, Excess of Loss), WXL /E or CatXL (Per-Event Excess of Loss or Catastrophe Excess of Loss).
5. Risk management by applying various reinsurance protections in a collective risk model.
6. Application of the reinsurer limit, multiple reinsurer limit in individual types of reinsurance.
7. Modeling of the total claim amount paid by the reinsurer by Monte Carlo simulations and measurement of risk reduction using risk measures.
8. Optimization in reinsurance (minimization of Value at Risk or Conditional Value at Risk, maximization of profit with constant variance, minimization of variance with constant profit, minimization of probability of ruin with constant profit).
9. Use of the extrem value theory(the Excess over Threshold method) in Non-proportional reinsurance.
10. Collective model for longer time periods. Stochastic process: Poisson process (loading process of the number of claims), compound Poisson process (surplus process) and their modeling.
11. Probability of ruin in the distant horizon: determination of the probability of ruin by Lundberg inequality and using Monte Carlo simulations.
12. Probability of ruin in finite time: determination of the probability of ruin by the Poisson cumulative distribution function, using simulations by the Monte Carlo method.
13.Use of Wiener process, shifted Brownian motion in the field of ruin theory.

Support literature:
Odporúčaná literatúra:
1. Horáková, G., Páleš, M. & Slaninka, F.: Teória rizika v poistení. Wolters Kluwer. 2015.
2. Kaas, R., Goovaerts, M., Dhaene, J., Denuit, M.: Modern actuarial risk theory using R, Berlin: Springer. 2008.
3. Charpentier, A.: Computation actuarial science with R. Taylor & Francis Group. 2015.
4. Albrecher, H., Beirlant, L., & Teugels, J. L.: Reinsurance: Actuarial and Statistical Aspects. New York: John Wiley & Sons. 2017.
5. Coles, S.: An Introduction to Statistical Modeling of Extreme Values.Springer. 2001.
6. Dobrow, R.: Introduction to Stochastic Processes with R. John Wiley & Sons. 2016.
7. Schilling, L. R., Partzsch, L.: Brownian motion. Walter de Gruyter GmbH & Co. KG. 2012.

8. Páleš, M., Slaninka, F.: Teória rizika v poistení : riešené príklady v jazyku R a Maxima. Letra Edu, 2021.

9. Cipra, T.: Zajištění a přenos rizik v pojišťovnictví. Grada Publishing, a.s.. 2004.

10. Skřivánková, V., Hančová, M.: Náhodné procesy a ich aplikácie. UPJŠ Košice. 2018.

11. Deelstra, G., Plantin, G.: Risk theory and reinsurance. Springer. 2014.

12. Mucha, V., Páleš, M., Sakálová, K. Calculation of the capital requirement using the Monte Carlo simulation for non-life. In Ekonomický časopis. Bratislava : Ekonomický ústav SAV : Prognostický ústav SAV, 2016, roč. 64, č. 9.

13. Horáková, G., Mucha, V. Optimálne zaisťovacie reťazce. In Ekonomický časopis. Bratislava : Ústav slovenskej a svetovej ekonomiky SAV : Prognostický ústav SAV, 2005, roč. 53, č. 6.

Syllabus:

1. Forms of insurance with supplementary forms of insurance (Pure indemnity insurance, First loss insurance, Insurance with an average clause, Quota insurance, With and without an excess).

2. Risk management by applying various forms of insurance in a collective risk model.

3. Modeling of the total claim amount paid by the insurer by Monte Carlo simulations and measurement of risk reduction using risk measures.

4. Reinsurance. Types of reinsurance. Proportional reinsurance (quota, excess reinsurance with respect to the sum insured (surplus)). Non-proportional reinsurance (excess reinsurance with respect to the amount of claims (WXL / R, Excess of Loss), WXL /E or CatXL (Per-Event Excess of Loss or Catastrophe Excess of Loss).

5. Risk management by applying various reinsurance protections in a collective risk model.

6. Application of the reinsurer limit, multiple reinsurer limit in individual types of reinsurance.

7. Modeling of the total claim amount paid by the reinsurer by Monte Carlo simulations and measurement of risk reduction using risk measures.

8. Optimization in reinsurance (minimization of Value at Risk or Conditional Value at Risk, maximization of profit with constant variance, minimization of variance with constant profit, minimization of probability of ruin with constant profit).

9. Use of the extrem value theory(the Excess over Threshold method) in Non-proportional reinsurance.

10. Collective model for longer time periods. Stochastic process: Poisson process (loading process of the number of claims), compound Poisson process (surplus process) and their modeling.

11. Probability of ruin in the distant horizon: determination of the probability of ruin by Lundberg inequality and using Monte Carlo simulations.

12. Probability of ruin in finite time: determination of the probability of ruin by the Poisson cumulative distribution function, using simulations by the Monte Carlo method.

13.Use of Wiener process, shifted Brownian motion in the field of ruin theory.

Language whose command is required to complete the course:
slovak

Notes:

Assessment of courses
Total number of evaluated students: 19

A	B	C	D	E	FX
21.05	21.05	15.79	31.58	10.53	0.0

Lecturer: Mgr. František Slaninka, PhD.

Date of the latest change: 01.02.2022

DESCRIPTION OF COURSE

University: University of Economics in Bratislava	

Faculty: Faculty of Economic Informatics	

Course code: KMA FHI/IIC21900/22	**Title of course:** Seminar for the Final Thesis I

Type, load and method of teaching activities:
 Form of course: Practical
 Recommended load of course (number of lessons):
 Per week: 2 **Per course:** 26
 Method of study: present

Number of credits: 2

Recommended semester/trimester of study: 3.

Degree of study: II.

Prerequisites:

Requirements to complete the course:
 13 hours of seminars
 39 hours of writing the thesis
 Total study load (in hours): 52

Student workload:
 13 hours of seminars
 39 hours of writing the thesis
 Total study load (in hours): 52

Teaching results:
Knowledge – the student will acquire the knowledge about legal and ethical aspects of writing of the thesis, on the current state of the art of the knowledge in the area related to the topics of the thesis (from the point of view of its content, its scope and available methods of research and procession of the data) and about the sources of data.
Competence – the student will be able to explore the current literary resources, apply their critical assessment and discover those areas, in which his/hers thesis could contribute to the enhancement of current body of knowledge. In addition, he/she will be able to locate the most appropriate sources of data and to discover the relevant methods of their processing and the methods of validation of the results, while accenting the ethical principles and rules for academic writing.
Skills – the student will be able to write the first chapter of the thesis on the overview of the current body of knowledge in an ethically consistent manner and to derive bases for the determination of the aims and goals and preliminary draft of the sources and methods of processing the data to be used in the second chapter.

Indicative content:
Underlying assumptions reflecting the topics of the thesis (life and non-life insurance, financial mathematics, mathematics and other issues), its geographical focus (Slovakia, neighbouring countries, EU, other countries/regions), expected outputs (comparisons, examinations of the new approaches, exploration of the existing relations, other) and its nature (overview, processing of the empirical data, other). Use of the Web of Science / Scopus databases, use of the ResearchGate platform and of the domestic literature and the presentation of survey of the relevant resources. Discussion on the legal and ethical aspects of academic writings. Discussion on the identified domains of knowledge, in which the thesis could contribute with the new findings. Determination of

the aims and goals of the thesis. Proposal of the methods proposed for achievements of the aims and goals of the thesis and for the validation of the findings and results. Presentation and the assessment of the first chapter and the outline of the second chapter of the thesis.

Support literature:
1. Zákon č. 185/2015 Z. z. Autorský zákon;
2. Študijný poriadok Ekonomickej univerzity v Bratislave;
3. Interná smernica Ekonomickej univerzity v Bratislave č. 8/2017 o záverečných a habilitačných prácach;
4. Etický kódex Ekonomickej univerzity v Bratislave;
5. Disciplinárny poriadok Ekonomickej univerzity v Bratislave pre študentov;;
6. Smith, M. (2019). Research Methods in Accounting. 5th Edition. Sage. ISBN 978-1526490674;
7. Vedecké články ktorých abstrakty sú uvádzané v databázach Web of Science resp. Scopus, ktoré sa vzťahujú k problematike témy konkrétnej záverečnej práce;
8. Právne predpisy ktoré sa vzťahujú k problematike témy konkrétnej záverečnej práce;
9. Iná vedecká a odborná literatúra (knihy, články v časopisoch, príspevky v zborníkoch), ktorá sa vzťahujú k problematike témy konkrétnej záverečnej práce.

Syllabus:
1. Discussion on the underlying assumptions reflecting the topics of the thesis (accounting, financial managements, taxes, other issues), geographical focus (Slovakia, neighboring countries, EU, other countries/regions), expected outputs (comparisons, examinations of the new approaches, exploration of the existing relations, other) and its nature (overview, processing of the empirical data, other);
2. Discussion about the use of the Web of Science / Scopus databases, use of the ResearchGate platform and of the domestic literature;
3. Seminar on legal aspects of academic writings;
4. Seminar on the ethical aspects of academic writings;
5. Presentation of survey of domestic resources relevant to the topics of the thesis;
6. Presentation of survey of foreign resources relevant to the topics of the thesis;
7. Discussion on the identified domains of knowledge, in which the thesis could contribute with the new findings;
8. Determination of the aims and goals of the thesis;
9. Discussion on the selection of the methods proposed for achievements the aims and goals of the thesis;
10. Discussion on the selection of the methods for the validation of the findings and results;
11. Presentation of the overview part (first chapter) of the thesis;
12. Presentation of the proposal of the methodical part (second chapter) of the thesis;
13. Assessment of the interim results of the writing.

Language whose command is required to complete the course:

Notes:

Assessment of courses
Total number of evaluated students: 19

NZ	Z
0.0	100.0

Lecturer: Mgr. Andrea Kaderová, PhD., Ing. Mgr. Zuzana Krátka, PhD., Mgr. Ing. Ingrid Krčová, PhD., doc. Mgr. Vladimír Mucha, PhD., doc. Ing. Michal Páleš, PhD., prof. RNDr. Ľudovít Pinda, CSc., prof. RNDr. Katarína Sakálová, CSc., PaedDr. Zsolt Simonka, PhD., Mgr. František

Slaninka, PhD., Ing. Lenka Smažáková, PhD., RNDr. Anna Strešňáková, PhD., doc. RNDr. Lea Škrovánková, PhD., doc. Mgr. Tatiana Šoltésová, PhD., Ing. Silvia Zelinová, PhD.
Date of the latest change: 01.04.2022
Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

DESCRIPTION OF COURSE

University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KMA FHI/IIC22901/22	Title of course: Seminar for the Final Thesis II

Type, load and method of teaching activities:
  Form of course: Practical
  Recommended load of course (number of lessons):
Per week: 2 Per course: 26
  Method of study: present

Number of credits: 2

Recommended semester/trimester of study: 4.

Degree of study: II.

Prerequisites:

Requirements to complete the course: 13 hours of seminars 39 hours of writing the thesis Total study load (in hours): 52

Student workload: 13 hours of seminars 39 hours of writing the thesis Total study load (in hours): 52

Teaching results: Knowledge – the student will acquire the knowledge about legal and ethical aspects of writing of the thesis, on the current state of the art of the knowledge in the area related to the topics of the thesis (from the point of view of its content, its scope and available methods of research and procession of the data) and about the sources of data. Competence – the student will be able to explore the current literary resources, apply their critical assessment and discover those areas, in which his/hers thesis could contribute to the enhancement of current body of knowledge. In addition, he/she will be able to locate the most appropriate sources of data and to discover the relevant methods of their processing and the methods of validation of the results, while accenting the ethical principles and rules for academic writing. Skills – the student will be able to write the first chapter of the thesis on the overview of the current body of knowledge in an ethically consistent manner and to derive bases for the determination of the aims and goals and preliminary draft of the sources and methods of processing the data to be used in the second chapter.

Indicative content: Underlying assumptions reflecting the topics of the thesis (life and non-life insurance, financial mathematics, mathematics and other issues), its geographical focus (Slovakia, neighbouring countries, EU, other countries/regions), expected outputs (comparisons, examinations of the new approaches, exploration of the existing relations, other) and its nature (overview, processing of the empirical data, other). Use of the Web of Science / Scopus databases, use of the ResearchGate platform and of the domestic literature and the presentation of survey of the relevant resources. Discussion on the legal and ethical aspects of academic writings. Discussion on the identified domains of knowledge, in which the thesis could contribute with the new findings. Determination of

the aims and goals of the thesis. Proposal of the methods proposed for achievements of the aims and goals of the thesis and for the validation of the findings and results. Presentation and the assessment of the first chapter and the outline of the second chapter of the thesis.

Support literature:
1. Zákon č. 185/2015 Z. z. Autorský zákon;
2. Študijný poriadok Ekonomickej univerzity v Bratislave;
3. Interná smernica Ekonomickej univerzity v Bratislave č. 8/2017 o záverečných a habilitačných prácach;
4. Etický kódex Ekonomickej univerzity v Bratislave;
5. Disciplinárny poriadok Ekonomickej univerzity v Bratislave pre študentov;;
6. Smith, M. (2019). Research Methods in Accounting. 5th Edition. Sage. ISBN 978-1526490674;
7. Vedecké články ktorých abstrakty sú uvádzané v databázach Web of Science resp. Scopus, ktoré sa vzťahujú k problematike témy konkrétnej záverečnej práce;
8. Právne predpisy ktoré sa vzťahujú k problematike témy konkrétnej záverečnej práce;
9. Iná vedecká a odborná literatúra (knihy, články v časopisoch, príspevky v zborníkoch), ktorá sa vzťahujú k problematike témy konkrétnej záverečnej práce.

Syllabus:
1. Discussion on the underlying assumptions reflecting the topics of the thesis (accounting, financial managements, taxes, other issues), geographical focus (Slovakia, neighboring countries, EU, other countries/regions), expected outputs (comparisons, examinations of the new approaches, exploration of the existing relations, other) and its nature (overview, processing of the empirical data, other);
2. Discussion about the use of the Web of Science / Scopus databases, use of the ResearchGate platform and of the domestic literature;
3. Seminar on legal aspects of academic writings;
4. Seminar on the ethical aspects of academic writings;
5. Presentation of survey of domestic resources relevant to the topics of the thesis;
6. Presentation of survey of foreign resources relevant to the topics of the thesis;
7. Discussion on the identified domains of knowledge, in which the thesis could contribute with the new findings;
8. Determination of the aims and goals of the thesis;
9. Discussion on the selection of the methods proposed for achievements the aims and goals of the thesis;
10. Discussion on the selection of the methods for the validation of the findings and results;
11. Presentation of the overview part (first chapter) of the thesis;
12. Presentation of the proposal of the methodical part (second chapter) of the thesis;
13. Assessment of the interim results of the writing.

Language whose command is required to complete the course:
slovak

Notes:

Assessment of courses
Total number of evaluated students: 11

NZ	Z
0.0	100.0

Lecturer: Mgr. Andrea Kaderová, PhD., Ing. Mgr. Zuzana Krátka, PhD., Mgr. Ing. Ingrid Krčová, PhD., doc. Mgr. Vladimír Mucha, PhD., doc. Ing. Michal Páleš, PhD., prof. RNDr. Ľudovít

Pinda, CSc., prof. RNDr. Katarína Sakálová, CSc., PaedDr. Zsolt Simonka, PhD., Mgr. František Slaninka, PhD., Ing. Lenka Smažáková, PhD., RNDr. Anna Strešňáková, PhD., doc. RNDr. Lea Škrovánková, PhD., doc. Mgr. Tatiana Šoltésová, PhD., Ing. Silvia Zelinová, PhD.
Date of the latest change: 01.04.2022
Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

DESCRIPTION OF COURSE

University: University of Economics in Bratislava	

Faculty: Faculty of Economic Informatics	

Course code: KMA FHI/IIC21310/21	**Title of course:** Software Applications for Actuaries

Type, load and method of teaching activities:
  Form of course: Practical
  Recommended load of course (number of lessons):
  Per week: 4 **Per course:** 52
  Method of study: present

Number of credits: 5

Recommended semester/trimester of study: 1.

Degree of study: II.

Prerequisites:

Requirements to complete the course:
 100% written work

Student workload:
 Total study load (in hours): 130 hours
 52 hours of lectures,
 52 hours preparation for seminars,
 26 hours preparation for written work.

Teaching results:
Completion of the subject Software applications for actuaries presupposes the development of IT skills and skills in the field of data science.
Knowledge
Progress in the field of new knowledge is evident after completing the course. Students will gain an overview of actuarial software and learn to work with programming languages R, Python and VBA. They will gain a basic overview of actuarial analysis in R and Python.
Competences
Based on the above knowledge, students can choose a suitable programming language according to its parameters and perform adequate actuarial analyzes, respectively analysis of data processing in these programming languages.
Skills
As part of the educational process, they will acquire such skills that will enable students to read, process and analyze data necessary for further actuarial analyzes, or to carry out such operations and create reports that can help in managerial decision-making in insurance companies.

Indicative content:
1. Actuarial software and possibilities of its use. Advantages disadvantages. R. Language R. R Studio Studio console. R Project. Objects in R (vector, factor, matrix, data table, list, array). Working with objects. Libraries (packages). Graphics in R.
2. Basics of programming in R. Data Science in R. Machine Learning in R. Data Manipulation (Data Wrangling). Imputation of missing values. Anomalies in the data. Working with dplyr, shiny and ggplot2 libraries.
3. Statistical analyzes in R. Probability distributions in R. Some applications of R in actuarial science.

4. Python language. Installation and start. Basic data types. Variables.
5. Programming mode. Some basic functions. Working with modules. Anaconda. Jupyter Notebook.
6. Data Science in Python. Interconnection R and Python languages. Some Python applications in actuarial science.
7. Introduction to Visual Basic for Applications (VBA) in Microsoft Excel. Getting acquainted with the VBA editor environment, Macro Recorder. Basics of object hierarchy. Working with a Range object (property: Cells, Value, FormulaR1C1, Column, Row, Count, Address, Offset, Resize, method: Select, End, Clear). Defining an object variable of type Range.
8. Area selection (Range, End method, CurrentRegion, UsedRange), Union and Intersect method, Area copying, Using With-End With and For Each-Next structures when working with a Range object.
9. Work with procedures. Procedure declaration, scope of procedures, declaration of variables, scope and their validity, array of variables and its declaration, fast loading of arrays, static and dynamic arrays, control of code flow using loops (For-Next, Do While, Do Until) and constructions (With -End With, For Each- Next, If - Then, Select Case).
10. Working with functions. Built-in user dialogs (Inputbox and MsgBox functions), selected workbook functions (WorksheetFunction) and VBA functions, creation of own functions (User defined functions).
11. Working with data in a workbook. Searching for VBA-compliant data, copying, deleting, and editing it (iteration method, SpeciallCells method, Autofilter method, AdvancedFilter method).
12. Creating dashboards using ActiveX controls, resp. Forms (ListBox, ComboBox, OptionButton, CheckBox, ScrollBar) and functions (Offset, Index, Choose, If, Match, VLookup, Direct, Column), resp. name manager and data verification (list).
13. Creating dashboards using a PivotTable in the context of a slicer, timeliner, and conditional formatting.

Support literature:
1. PÁLEŠ, M. Jazyk R pre aktuárov. Bratislava : Vydavateľstvo Letra Edu, 2019.
2. DE LAFAYE MICHEAUX, P. – DROUILHET, R. – LIQUET, B. The R Software. Fundamentals of Programming and Statistical Analysis. New York : Springer, 2013.
3. DUTANG, C. – GOULET, V. – PIGEON, M. actuar: An R Package for Actuarial Science. Journal of Statistical Software, 2008.
4. ALBERT, J. – RIZZO, M. R by Example. New York : Springer, 2012.
5. CHARPENTIER, A. Computational Actuarial Science with R. Boca Raton : CRC Press, 2015.
6. LANTZ, B. Machine Learning with R. Second Edition. Birmingham : Packt Publishing, 2015.
7. JEKEL, C. Numerical Python: Scientific Computing and Data Science Applications with Numpy, SciPy and Matplotlib. In Siam Review, vol. 62, 2, 2020.
8. PECINOVSKÝ, R. Python. Kompletní příručka jazyka pro verzi 3.8. Praha: Grada Publishing, 2020.
9. PILGRIM, M. Python 3. Ponořme se do Python(u) 3. Praha: CZ.NIC, z. s. p. o., 2011.
10. UNPINGCO, J. Python for Probability, Statistics, and Machine Learning. Second Edition. Cham: Springer Nature Switzerland AG, 2016.
11. HILPISCH, Y. Derivatives Analytics with Python. Data Analysis, Models, Simulation, Calibration and Hedging. West Sussex: John Wiley & Sons Ltd, 2015.
12. ALEXANDER, M. – KUSLEIKA, D. Excel 2019. Power programming with VBA. Indianapolis: John Wiley & Sons, Inc. 2019.
13. KRÁL, M. Excel VBA. Výukový kurz, Praha: Computer Press, 2012.
14. MANSFIELD, R. Mastering VBA for Microsoft Office 2016. Indianapolis: John Wiley & Sons, Inc. 2016.
15. ALEXANDER, M.– WALKENBACH, J. Microsoft Excel. Dashboards & Reports. New Jersey: 2013.

16. ALBRIGHT, CH., S. VBA for Modelers. Developing decision support systems with Microsoft Office Excel. South-Western. 2012.
17. GOLDMEIER, J. –DUGGIRALA, P. Dashboards for Excel. California: Apress. 2015.

Syllabus:
1. Actuarial software and possibilities of its use. Advantages disadvantages. R. Language R. R Studio Studio console. R Project. Objects in R (vector, factor, matrix, data table, list, array). Working with objects. Libraries (packages). Graphics in R.
2. Basics of programming in R. Data Science in R. Machine Learning in R. Data Manipulation (Data Wrangling). Imputation of missing values. Anomalies in the data. Working with dplyr, shiny and ggplot2 libraries.
3. Statistical analyzes in R. Probability distributions in R. Some applications of R in actuarial science.
4. Python language. Installation and start. Basic data types. Variables.
5. Programming mode. Some basic functions. Working with modules. Anaconda. Jupyter Notebook.
6. Data Science in Python. Interconnection R and Python languages. Some Python applications in actuarial science.
7. Introduction to Visual Basic for Applications (VBA) in Microsoft Excel. Getting acquainted with the VBA editor environment, Macro Recorder. Basics of object hierarchy. Working with a Range object (property: Cells, Value, FormulaR1C1, Column, Row, Count, Address, Offset, Resize, method: Select, End, Clear). Defining an object variable of type Range.
8. Area selection (Range, End method, CurrentRegion, UsedRange), Union and Intersect method, Area copying, Using With-End With and For Each-Next structures when working with a Range object.
9. Work with procedures. Procedure declaration, scope of procedures, declaration of variables, scope and their validity, array of variables and its declaration, fast loading of arrays, static and dynamic arrays, control of code flow using loops (For-Next, Do While, Do Until) and constructions (With -End With, For Each- Next, If - Then, Select Case).
10. Working with functions. Built-in user dialogs (Inputbox and MsgBox functions), selected workbook functions (WorksheetFunction) and VBA functions, creation of own functions (User defined functions).
11. Working with data in a workbook. Searching for VBA-compliant data, copying, deleting, and editing it (iteration method, SpeciallCells method, Autofilter method, AdvancedFilter method).
12. Creating dashboards using ActiveX controls, resp. Forms (ListBox, ComboBox, OptionButton, CheckBox, ScrollBar) and functions (Offset, Index, Choose, If, Match, VLookup, Direct, Column), resp. name manager and data verification (list).
13. Creating dashboards using a PivotTable in the context of a slicer, timeliner, and conditional formatting.

Language whose command is required to complete the course:
slovak

Notes:

Assessment of courses
Total number of evaluated students: 69

A	B	C	D	E	FX
14.49	10.14	17.39	24.64	27.54	5.8

Lecturer: doc. Mgr. Vladimír Mucha, PhD., doc. Ing. Michal Páleš, PhD.

Date of the latest change: 01.02.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

DESCRIPTION OF COURSE

University: University of Economics in Bratislava

Faculty: Faculty of Economic Informatics

Course code: KŠ FHI/IID22240/21	Title of course: Statistical Inference

Type, load and method of teaching activities: Form of course: Lecture / Practical Recommended load of course (number of lessons): Per week: 2 / 2 Per course: 26 / 26 Method of study: present

Number of credits: 6

Recommended semester/trimester of study: 2.

Degree of study: II.

Prerequisites:

Requirements to complete the course: 30 % assignments (2 assignments) 70 % final exam (35% theoretical part, 35% practical – examples solution)

Student workload: Total study load (in hours): 156 hours Distribution of study load Lectures participation: 26 hours Seminar participation: 26 hours Preparation for seminars: 26 hours Preparation for assignments: 26 hours Final exam preparation: 52 hours

Teaching results: At the end of the semester, students will have a good overview of inference methods used in statistics, more specifically: In particular, students acquire the following abilities: - Students will acquire knowledge about the principles of individual methods as well as about the contents between different methods so that they can be properly decided in the real situation. They will be able to interpret the methods results correctly. Students acquire in particular the following skills: - Students will be able to apply methods of statistical inference in appropriate situations and verify the assumptions of their use Students will acquire the following competencies: - Students will be able to realize a qualified analysis of data from the selection survey, creatively approaching the absent prerequisite for some methods, qualified to interpret the results in the necessary contexts

Indicative content: The course provides comprehensive knowledge of the theoretical principle, assumptions and procedures for inference methods so that students will adequately use them in practice. In addition to points and interval estimates, a great emphasis is given on testing hypotheses that are part of various statistical procedures (mainly for verification of assumptions and to verify statistical significance).

The course deals also with non-parametric tests that may be widely used if the assumptions of numeric variables distribution are not met.

Support literature:
1. Kotlebová a kol. (2015). Štatistická indukcia v príkladoch. Bratislava: Ekonóm.
2. Malá, I. (2013). Statistické úsudky. Praha: Professional Publishing.
3. Garthwaite, P. H., Jolliffe, I. T. (1995). Statistical Inference. Prentice-Hall International, Inc.
4. Anderson, D. R., Sweeney, D. J., Williams, T. A., Camm, J. D., Cochran, J. J. (2016). Statistics for business and economics. Nelson Education.
5. Pacáková, V. a kol. (2012). Štatistická indukcia pre ekonómov (1. vyd.). Bratislava: Ekonóm.
6. Pacáková, V. a kol. (2015). Štatistické indukcia pre ekonómov a manažérov. Bratislava: Wolters Kluwer.
7. Liu, H. (2015). Comparing Welch ANOVA, a Kruskal-Wallis test, and traditional ANOVA in case of heterogeneity of variance. Richmond, Virginia: Virginia Commonwealth University.
8. Blatná, D. (1996). Neparametrické metody. Praha: VŠE.
Literature will be continuously updated with the latest scientific and professional titles.

Syllabus:
1. Introduction: Random variable – basic concepts, properties and characteristics.
2. Discrete and continuous random variables.
3. Point estimation of the population parameters – principle and methods of the point estimation.
4. Interval estimation of the population parameters.
5. Hypothesis testing.
6. Inference conclusions of two populations parameters.
7. Analysis of variance.
8. Analysis of categorical data independency.
9. Goodness of fit-tests.
10. Nonparametric tests – the principle, comparing with parametric tests, randomity tests, tests of population parameters.
11. Nonparametric tests comparing two populations.
12. Nonparametric tests comparing more than two populations.
13. Summary.

Language whose command is required to complete the course:
Slovak

Notes:

Assessment of courses
Total number of evaluated students: 32

A	B	C	D	E	FX
9.38	18.75	28.13	25.0	18.75	0.0

Lecturer: RNDr. Eva Kotlebová, PhD.

Date of the latest change: 07.02.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.

DESCRIPTION OF COURSE

University: University of Economics in Bratislava	

Faculty: Faculty of Economic Informatics	

Course code: KMA FHI/IIC22900/22	**Title of course:** Thesis Defence

Type, load and method of teaching activities:
  Form of course:
  Recommended load of course (number of lessons):
  Per week: Per course:
  Method of study: present

Number of credits: 10

Recommended semester/trimester of study:

Degree of study: II.

Prerequisites:

Requirements to complete the course:

Student workload:

Teaching results:

Indicative content:

Support literature:

Syllabus:

Language whose command is required to complete the course:

Notes:

Assessment of courses
 Total number of evaluated students: 8

A	B	C	D	E	FX
75.0	0.0	25.0	0.0	0.0	0.0

Lecturer:

Date of the latest change: 05.04.2022

Approved by: Person responsible for the delivery, development and quality of the study programme doc. Mgr. Tatiana Šoltésová, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Ľudovít Pinda, CSc., Person responsible for the delivery, development and quality of the study programme doc. RNDr. Lea Škrovánková, PhD., Person responsible for the delivery, development and quality of the study programme prof. RNDr. Katarína Sakálová, CSc., Person responsible for the delivery, development and quality of the study programme doc. Mgr. Vladimír Mucha, PhD.