

COURSE DESCRIPTION

Program:

BSc in Business Informatics

Subject: Accounting

Professor in charge: Dr. Gergely Tóth

Number of hours: 45

Credits: 3

Assessment: Mid-term grade

The aim of the subject:

Students will improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements. They will get to know the rules of compiling the financial statements in detail, and, by the end of the semester, will be able to independently compile the individual parts of the financial statements, as well as perform and interpret the tasks related to the year-end closing.

Knowledge:

Entrepreneurship and accounting. The concept, purpose and areas of accounting. The regulation of accounting, the Accounting Act. Types, information content and parts of accounting reports. The concept of the balance sheet, the content of each balance sheet line. The concept and types of the Profit and Loss Account, the categories of results. The content elements of the supplementary annex and the business report. The rules of auditing, disclosure, deposit, and disclosure. The concept and tasks of accounting closure, the issues of inventory and inventory, valuation principles and procedures.

Competences:

The students

- will be familiar with the basic concepts of accounting, the accounting information system, the parts of the financial statements and the accounting processes supporting them. They will know the relationships of accounting, will have an overview of the most important theoretical approaches, and will have mastered the basics of the accounting way of thinking.
- Will be able to cooperate with other fields of knowledge and socio-economic subsystems;
- will be receptive to new information, new professional knowledge and methodologies,
- will be open to taking on new, independent and cooperative tasks and responsibilities,
- will, under general professional supervision, independently perform and organize the tasks specified in their job description;
- will take responsibility for their analyses, conclusions and decisions.

Teaching methodology:

The curriculum is processed through lectures, seminars, and on the basis of the student's work done individually or in groups. The seminars are aimed at the practical application of theoretical knowledge, during which students solve tasks under the guidance of the instructor, process case studies, and develop and present proposals for solving problems in different situations. The processing of the curriculum is supported by modern ICT tools, self-assessment tasks, examples and other educational aids developed by the instructor.

Compulsory and Recommended Literature:

Introduction to Financial Accounting - 2024-A-D - Open Textbook

Library <https://share.google/ZymTyDzZnbUXdOEjh>

Subject: Auditing of Information Systems 1

Professor in charge: Dr. Rózsa Horváth Bokor

Number of hours: 30

Credits: 3

Assessment: Exam

The aim of the subject:

For the students to improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements.

Knowledge:

The categories of auditing. Auditing standards. (COBIT) Principles of IT management. Protection of IT assets and infrastructure. Ensure business continuity and disaster response planning. Auditing of IT systems and projects: the procedures of system development, investment and maintenance audits. Methods related to testing procedures. IT control of projects. Challenges and how to deal with them in the field of IT auditing.

Competences:

The students

- will have general knowledge of the regulatory issues and problems of the information society;
- will have basic knowledge of all areas of information management, including IT strategy, process management, system development, knowledge management, IT service management, project management, risk management, performance management, IT asset management, IT security and IT audit;
- will be able, with the help of the acquired IT procedures and methods, to explore the operating conditions of applications in real business and organizational conditions, to weigh and communicate the benefits, dangers and risks.

Teaching methodology:

The curriculum is processed through lectures, seminars, and on the basis of the student's work done individually or in groups. The seminars are aimed at the practical application of theoretical knowledge, during which students solve tasks under the guidance of the instructor, process case studies, and develop and present proposals for solving problems in different situations. The processing of the curriculum is supported by modern ICT tools, self-assessment tasks, examples and other educational aids developed by the instructor.

Compulsory and Recommended Literature:

Mehta, A. M. (2024). 07.01. Identifying IS Audit Findings. *Auditing Information Systems*.

<https://ecampusontario.pressbooks.pub/auditinginformationsystems/>

Tuffley, D. (2025). *InfoTech Governance, Policy, Ethics & Law*. Griffith University.

<https://griffithuniversity.pressbooks.pub/infotech-governance-policy-ethics/>

Subject: Business Data Mining 2

Professor in charge: Iván Seres

Number of hours: 30

Credits: 4

Assessment: Exam

The aim of the subject:

For the students to improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements.

Knowledge:

Factor analysis, cluster analysis, classification models, neural networks, decision trees.

Competences:

The students

- will have the basic knowledge of information systems, will understand the principles of architecture organization, and will be able to interpret the components of computer and information architecture in context;
- will be familiar with the theoretical components of computing infrastructure, the theoretical structure of hardware components, communication and system software, and the areas of data management including the basic concepts of databases, data processing, representation and visualization;
- will undertake and credibly represent the professional principles of their IT deployment field (company, public administration or public service organization).

Teaching methodology:

The curriculum is processed on the basis of a lecture. The instructor presents the curriculum in an interactive way, the processing of which is supported by modern ICT tools, self-test tasks and other educational aids developed by the instructor.

Compulsory and Recommended Literature:

IBM. (n.d.). *IBM SPSS Statistics Base 28*. IBM.

https://www.ibm.com/docs/en/SSLVMB_28.0.0/pdf/IBM_SPSS_Statistics_Base.pdf

IBM. (n.d.). *IBM SPSS Modeler 19.0 User's Guide*. IBM.

https://www.ibm.com/docs/en/SS3RA7_19.0.0/pdf/ModelerUsersGuide.pdf

Subject: Business English 2

Professor in charge: Dr. Magdolna Kimmel

Number of hours: 45

Credits: 3

Assessment: Mid-term grade

The aim of the subject:

For the students to improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements.

Knowledge:

1. Written and spoken business communication

Make phone calls, phone calls, phone calls, pass on messages, leave. Polite questions, repetitions, paraphrases. Business letters, e-mails, their structure, classification, outline (inquiry, order, confirmation of orders, request for information, accept/decline invitation) Write reports, summaries. Building a successful presentation, content elements, style, visual presentation, linguistic elements. Role play: Treatment of complaints. Expressing requests, requests, expressing dissatisfaction in speech and writing.

Case Study: Editing and Presenting a Written Proposal Based on the Research Results of a Product or Service Satisfaction Survey

2. Business Etiquette

The importance of cultural awareness in business. Topics of informal conversations, forms of politeness, the importance and differences of body language in business, communication patterns according to cultures. Analysis of conflicts based on diversity of cultures, treatment of conflicts, role play. Etiquette of business entertainment, gift-giving, dress code, differences in conducting a business meeting, differences in time management. Business etiquette, the consequences of unethical business behaviour. Case studies.

Role-play: Solving business problems: Loss of profit or violation of principles?

3. Marketing

Marketing analysis. Marketing Mix (4P). The most common methods of influencing consumers (advertising, special offers, competitions). Features of effective promotion, processing of case studies

Project work: Planning of advertising campaign and its presentation

Competences:

The students

- will possess the basic professional vocabulary of economics in their native language and at least one foreign language;
- will understand and use the typical online and printed literature of the specific field in Hungarian and foreign languages;
- will be able to communicate in writing, orally and with modern info-communication tools, in a foreign language;
- will develop the attitudes necessary for successful intercultural communication.

Teaching methodology:

The teaching is carried out by using interactive language teaching methods based on the traditions of communicative language teaching. During teaching, the instructor also uses info-communication devices. In order to intensively develop language skills, students solve pair and group tasks. Students are admitted to the different student groups on the basis of a language level assessment. Instructors provide online and printed materials for students upon request.

Compulsory and Recommended Literature:

- Cotton, D., Falvey, D. Kent, S: New Market Leader Upper-Intermediate. Harrow, Pearson-Longman. Harrow, 2006. 176 p. ISBN 978-1-4058-1309-09
- Duckworth, M., Turner, R.: Business Results Upper-Intermediate. OUP, Oxford, 2008 . 167 p. ISBN 978 0 19 476810 8
- Online kiegészítő anyagok
<https://www.pearsonelt.com/myenglishlab.html>
<https://elt.oup.com/student/result/?mode=student&cc=hu&selLanguage=hu>

Subject: Business Intelligence

Professor in charge: Dr. Imre Balogh

Number of hours: 30

Credits: 2

Assessment: Exam

The aim of the subject:

For the students to improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements.

Knowledge:

The concept, function, and role of business intelligence in corporate management. Data structures and data models in business intelligence. Information System and Business Intelligence. The basic characteristics of the different layers of the information architecture (transaction processing, operational operation support, decision support, teamwork, workflow) and the relationships between them. The architecture of business intelligence. Information overload and under-overload. Information system as a decision preparation (DSS) and management information (OLAP, MIS, EIS, data warehouse) service – extraction of information supporting decisions. Intelligence solutions, industry solutions, uses, trends, tendencies. The structure of the enterprise resource planning system (ERP) and its role in solving tasks. The role of company characteristics. Incorporation of general and individual business intelligence into ERP systems.

Competences:

The students

- will have basic knowledge of information systems, will understand the principles of architecture organization, and will be able to interpret the components of computer and information architecture in context,
- will be familiar with the theoretical components of the IT infrastructure, the theoretical components of hardware components; the structure of the system, communication and system software, the areas of data management including the basic concepts of databases, data processing, representation and visualization.

Teaching methodology:

The curriculum is processed through lectures, seminars, and on the basis of the student's work done individually or in groups. The seminars are aimed at the practical application of theoretical knowledge, during which students solve tasks under the guidance of the instructor, process case studies, and develop and present proposals for solving problems in different situations. The processing of the curriculum is supported by modern ICT tools, self-assessment tasks, examples and other educational aids developed by the instructor.

Compulsory and Recommended Literature:

Raisinghani, M. S. (2025). *Foundations of information systems*. OpenStax.

<https://openstax.org/books/foundations-information-systems/pages/index>

Bourgeois, D. T., Smith, J. L., Wang, S., & Mortati, J. (2019). *Information systems for business and beyond*. Saylor Foundation.

<https://open.umn.edu/opentextbooks/textbooks/information-systems-for-business-and-beyond>

Subject: Communication Protocols

Professor in charge: Zsuzsanna Kocsis

Number of hours: 30

Credits: 3

Assessment: Exam

The aim of the subject:

For the students to improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements.

Knowledge:

The basic concepts, tools, and standardization organizations of protocol development. Protocol development process, stages, message exchanges, service points required for specific functions. Industrial and economic applications of communication protocols, forms of service based on communication systems and their regulation. New trends.

Competences:

The students

- will be able to identify operational risks,
- will plan and manage small development projects;
- will look at their own professional competencies and activities in a reflective way;
- will strive for continuous professional training and general self-education;
- will make self-education one of the tools for achieving their professional goals

Teaching methodology:

The curriculum is processed through lectures, seminars, and on the basis of the student's work done individually or in groups. The seminars are aimed at the practical application of theoretical knowledge, during which students solve tasks under the guidance of the instructor, process case studies, and develop and present proposals for solving problems in different situations. The processing of the curriculum is supported by modern ICT tools, self-assessment tasks, examples and other educational aids developed by the instructor.

Compulsory and Recommended Literature:

Bonaventure, O. (2015). (2nd ed., draft). UCLouvain.
<https://oer.uclouvain.be/jspui/handle/20.500.12279/37>

European Telecommunications Standards Institute. (2021). *Understanding ICT standardization: Principles and practice* (2nd ed.).
https://www.etsi.org/images/files/Education/Textbook_Understanding_ICT_Standardization.pdf

Bradner, S. (1996, October). *The Internet standards process—Revision 3* (BCP 9, RFC 2026). RFC Editor. <https://doi.org/10.17487/RFC2026>

OASIS Open. (2019, March 7). *MQTT version 5.0*. <https://docs.oasis-open.org/mqtt/mqtt/v5.0/os/mqtt-v5.0-os.pdf>

Modbus Organization. (2012, April 26). *MODBUS application protocol specification V1.1b3*. https://www.modbus.org/file/secure/modbusprotocolspecification.pdf?utm_source=chatgpt.com

Subject: Computer Networks

Professor in charge: Dr. habil. József Katona

Number of hours: 45

Credits: 2

Assessment: Mid-term grade

The aim of the subject:

For the students to improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements.

Knowledge:

Network topologies, Network protocols (ARP, DNS, DHCP, HTTP), IP addressing, routing, routing protocols, Switches, routers. Network security.

Competences:

The students

- will have the basic knowledge of information systems, understands the principles of architecture organization, and is able to interpret the components of computer and information architecture in context;
- will be familiar with the theoretical components of computing infrastructure, the theoretical structure of hardware components, communication and system software, and the areas of data management, including the basic concepts of databases, data processing, representation and visualization.

Teaching methodology:

The curriculum is processed through lectures, seminars, and on the basis of the student's work done individually or in groups. The seminars are aimed at the practical application of theoretical knowledge, during which students solve tasks under the guidance of the instructor, process case studies, and develop and present proposals for solving problems in different situations. The processing of the curriculum is supported by modern ICT tools, self-assessment tasks, examples and other educational aids developed by the instructor.

Compulsory and Recommended Literature:

Bruce Davie, V. (2019). Computer Networks: A Systems Approach.

<https://open.umn.edu/opentextbooks/textbooks/771>

Bonaventure, O. (2011). Computer Networking: Principles, Protocols and Practice.

<https://open.umn.edu/opentextbooks/textbooks/computer-networking-principles-protocols-and-practice>

Subject: Computer Science (Algorithm Theory) 2

Professor in charge: Dr. Rózsa Horváth-Bokor

Number of hours: 15

Credits: 3

Assessment: Exam

The aim of the subject:

For the students to improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements.

Knowledge:

Dynamic sets, Types of operations. Search, Naïve insertion, Naïve deletion, Red-black trees. AVL tree, B-tree, Jump lists, Elementary data structures, Stack. Row, Chained List, Split Tables, Direct Addressing, Split Function, Select Split Function, Open Addressing, Disjoint Sets, Chained List Representation, Disjoint Set Forests, Contiguous Components, Pattern Matching, Brute Force, Rabin-Karp Algorithm, Knuth-Morris-Pratt Algorithm, Boyer-Morce Algorithm, Branch and bound, Back-track

Competences:

The students

- will know and understand the basic concepts and connections of computer science, as well as further expands formal models and knowledge of routine problems related to application areas;
- will be familiar with the basic programming structures, the methodology of software development and the most important programming environments in the context of programming. and will further expand their knowledge
- will be able, with the help of the acquired IT procedures and methods, to explore the operating conditions of applications in real business and organizational conditions, to weigh and communicate the benefits, dangers and risks;
- will be able to understand and analyse business processes, to prepare and perform the requirement specification of software applications, and to perform simple programming tasks.

Teaching methodology:

The curriculum is processed through lectures, seminars, and on the basis of the student's work done individually or in groups. The seminars are aimed at the practical application of theoretical knowledge, during which students solve tasks under the guidance of the instructor, process case studies, and develop and present proposals for solving problems in different situations. The processing of the curriculum is supported by modern ICT tools, self-assessment tasks, examples and other educational aids developed by the instructor.

Compulsory and Recommended Literature:

Erickson, J. (2023). *Algorithms*.

<https://jeffe.cs.illinois.edu/teaching/algorithms/book/Algorithms-JeffE.pdf>

Kochenderfer, M. J., & Wheeler, T. A. (2019). *Algorithms for optimization*. Mit Press.

<https://algorithmsbook.com/optimization/>

Subject: Controlling

Professor in charge: Dr. György Fabricius-Ferke

Number of hours: 30

Credits: 4

Assessment: Mid-term grade

The aim of the subject:

For the students to improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements.

Knowledge:

The concept, development and role of controlling in the life of companies. The relationship between leadership and controlling, the person of the controller. Controlling principles and control circles. Managerial accounting relationship with accounting. The relationship between strategic plan and strategic controlling. The role and methods of design. Efficient cost management. Cost analysis and planning. Rigid and flexible cost accounting, Direct costing, GBS structure, Beyond budgeting. Specialized controlling. Application of controlling methods in practice.

Competences:

The students

- will, by applying the theories and methods learned, explore, systematize and analyse facts and fundamental connections, will formulate independent conclusions and critical remarks, will prepare proposals for decision-making, and will make decisions in routine and partly unknown domestic and international environments;
- will take responsibility for their analyses, conclusions and decisions;
- will be receptive to new information, new professional knowledge and methodologies, and open to taking on new, independent and cooperative tasks and responsibilities;
- will strive to develop their knowledge and working relationships, and to cooperate with their colleagues.

Teaching methodology:

The curriculum is processed through lectures, seminars, and on the basis of the student's work done individually or in groups. The seminars are aimed at the practical application of theoretical knowledge, during which students solve tasks under the guidance of the instructor, process case studies, and develop and present proposals for solving problems in different situations. The processing of the curriculum is supported by modern ICT tools, self-assessment tasks, examples and other educational aids developed by the instructor.

Compulsory and Recommended Literature:

"Introduction to Management Accounting" – OpenStax

Link: <https://openstax.org/details/books/introduction-management-accounting>

"Management Accounting and Control"

Szerzők: Anthony A. Atkinson, Robert S. Kaplan, Ella Mae Matsumura, S. Mark Young

Subject: Data Analysis, Data Visualization 2

Professor in charge: Dr. István Gerják

Number of hours: 45

Credits: 4

Assessment: Mid-term grade

The aim of the subject:

For the students to improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements.

Knowledge:

Introduction to data visualization using Python. Python data structures, visualization of prepared data. Use of data visualization software libraries (Seaborn, Matplotlib), visual representation of data structures.

Competences:

The students

- will be familiar with the theoretical components of computing infrastructure, the theoretical structure of hardware components, communication and system software, and the areas of data management, including the basic concepts of databases, data processing, representation and visualization;
- will be able to perform tasks related to database management and solve simple data migration tasks;
- will undertake and credibly represent the professional principles of their IT deployment field (company, public administration or public service organization).

Teaching methodology:

The curriculum is processed through lectures, seminars, and on the basis of the student's work done individually or in groups. The seminars are aimed at the practical application of theoretical knowledge, during which students solve tasks under the guidance of the instructor, process case studies, and develop and present proposals for solving problems in different situations. The processing of the curriculum is supported by modern ICT tools, self-assessment tasks, examples and other educational aids developed by the instructor.

Compulsory and Recommended Literature:

Ault, S. V., Liao, S. N., & Musolino, L. (2025). *Principles of data science*. OpenStax.

<https://openstax.org/details/books/principles-data-science>

Das, U., Lawson, A., Mayfield, C., & Norouzi, N. (2024). *Introduction to Python Programming*. OpenStax.

https://eng.libretexts.org/Bookshelves/Computer_Science/Programming_Languages/Python_Programming_%28OpenStax%29/15%3A_Data_Science

Subject: Data and Information Security of Organizations

Professor in charge: Kocsis Zsuzsanna

Number of hours: 45

Credits: 4

Assessment: Exam

The aim of the subject:

For the students to improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements.

Knowledge:

The right to informational self-determination and freedom of information. Protection and flow of data of natural persons. Protect your classified information. Personal, physical, administrative, electronic security. Electronic systems, encryption and radiation security. Electronic identification of the internal market for electronic transactions and trust services.

Competences:

The students

- will have basic knowledge of all areas of information management, including IT strategy, process management, system development, knowledge management, IT service management, project management, risk management, performance management, IT asset management, IT security and IT audit;
- will be able to identify operational risks.

Teaching methodology:

The curriculum is processed through lectures, seminars, and on the basis of the student's work done individually or in groups. The seminars are aimed at the practical application of theoretical knowledge, during which students solve tasks under the guidance of the instructor, process case studies, and develop and present proposals for solving problems in different situations. The processing of the curriculum is supported by modern ICT tools, self-assessment tasks, examples and other educational aids developed by the instructor.

Compulsory and Recommended Literature:

Nieles, M., Dempsey, K., & Pillitteri, V. Y. (2017). *An introduction to information security* (NIST Special Publication 800-12 Rev. 1). National Institute of Standards and Technology.

<https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-12r1.pdf>

Council of Europe, & European Union Agency for Fundamental Rights. (2018). *Handbook on European data protection law: 2018 edition*. Council of Europe.

https://fra.europa.eu/sites/default/files/fra_uploads/fra-coe-edps-2018-handbook-data-protection_en.pdf

Subject: Data Mining Algorithms 2

Professor in charge: Iván Seres

Number of hours: 30

Credits: 4

Assessment: Mid-term grade

The aim of the subject:

For the students to improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements.

Knowledge:

Circumscribing the concept of data mining, other names (Knowledge Discovery), sub-areas, border areas, typical types of tasks in data mining, typical groups of tools for solving problems, data mining software, databases, literature. Feature Extraction: Similarity Measures, Distances, String Search, String Match, Edit Distance, BLAST, DTW. Properties of multi-dimensional feature-space. Dimensionalisation, Feature-Space Transformations, LLE, Multidimensional Scaling, LDA, PCA, ICA. Selection procedures. Clustering, k-means, k-centre, fuzzy C-means, hierarchical methods, UPGMA. Regression methods (linear, non-linear, logistic). Classification problems, types, basic concepts, generative and discriminatory classification, single-class learning, types of two-class and multi-class learning, ranking, evaluation (measures, ROC, AUC) (cross-validation, train-test-evaluation cutting, overlearning, noise). Decision trees in data mining, random forest. Statistical models, Naïve Bayes, GMM, Parsen estimator. Neural networks (multilayer perceptron networks, various activation functions, Radial Basis. Voting, bagging, boosting, HMM. WEB and Text Mining.

Competences:

The students

- will be familiar with the theoretical components of the IT infrastructure, the theoretical components of hardware components, the structure of the system, communication and system software, the areas of data management including the basic concepts of databases, data processing, representation and visualization;
- will be able to perform tasks related to database management and solve simple data migration tasks.

Teaching methodology:

The curriculum is processed through lectures, seminars, and on the basis of the student's work done individually or in groups. The seminars are aimed at the practical application of theoretical knowledge, during which students solve tasks under the guidance of the instructor, process case studies, and develop and present proposals for solving problems in different situations. The processing of the curriculum is supported by modern ICT tools, self-assessment tasks, examples and other educational aids developed by the instructor.

Compulsory and Recommended Literature:

Birant, D. (Ed.). (2021). *Data mining: methods, applications and systems*. BoD–Books on Demand.

<https://www.intechopen.com/books/9961>

Hahsler, M. (2025). An R companion for introduction to data mining.

https://mhahsler.github.io/Introduction_to_Data_Mining_R_Examples/book/R-Companion-Data-Mining.pdf

Subject: Database Management Systems 1

Professor in charge: Dr. István Gerják

Number of hours: 30

Credits: 4

Assessment: Exam

The aim of the subject:

For the students to improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements.

Knowledge:

Theory of database design. Basics of relational algebra The query language (SQL) of relational database managers. The operation, functions and use of the database manager. Fast, economical processing of data stored on the computer. Methods of synthesis, selection, analysis. Exploration and demonstration of research knowledge. The use and management of SQL database language elements, such as Data Definition Language (DDL), Data Manipulation Language (DML).

Competences:

The students

- will be familiar with the theoretical components of computing infrastructure, the theoretical structure of hardware components, communication and system software, and the areas of data management, including the basic concepts of databases, data processing, representation and visualization;
- will be able to adapt economic applications, initiate organizational changes necessary for the introduction of IT applications, and cooperate in implementation.

Teaching methodology:

The curriculum is processed on the basis of a lecture. The instructor presents the curriculum in an interactive way, the processing of which is supported by modern ICT tools, self-test tasks and other educational aids developed by the instructor.

Compulsory and Recommended Literature:

Watt, A., & Eng, N. (2016). Database Design. *Retrieved May, 11.*

<https://ecampusontario.pressbooks.pub/databasesdesign02/>

McFadyen, R. (2022). Relational Databases and Microsoft Access 365.

<https://open.umn.edu/opentextbooks/textbooks/442>

Subject: Decision Support Systems

Professor in charge: Dr. Rózsa Horváth-Bokor

Number of hours: 30

Credits: 4

Assessment: Exam

The aim of the subject:

For the students to improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements.

Knowledge:

Decision support tools (DSS/GDSS). Expert Systems (ES). Statistical and data mining tools (DMs). Artificial intelligence-assisted tools (AI). Enterprise Resource Planning Systems. Simulation tools. Decision support software: Expert Choice, Promethee, etc. Compare programs. Weighted methods, Ranking methods. Expert systems, Artificial intelligence Rule-based inference systems. Case-Based Inference (CBR). Applications of artificial intelligence. Application examples: preliminary testing of transport systems, production systems (FMS), supply systems, logistics problems. Comparison of other programs and decision-making tools

Competences:

The students

- will be capable of operating economic applications and providing user services;
- will be able to resolve IT conflict situations that arise in the economic environment.

Teaching methodology:

The curriculum is processed through lectures, seminars, and on the basis of the student's work done individually or in groups. The seminars are aimed at the practical application of theoretical knowledge, during which students solve tasks under the guidance of the instructor, process case studies, and develop and present proposals for solving problems in different situations. The processing of the curriculum is supported by modern ICT tools, self-assessment tasks, examples and other educational aids developed by the instructor.

Compulsory and Recommended Literature:

Jao, C. (Ed.). (2010). *Decision support systems*. BoD–Books on Demand.

<https://www.intechopen.com/books/3153>

Averweg, U. R. F. (2012). *Decision-making support systems: Theory & practice-eBooks and textbooks from bookboon. com*. bookboon. com.

[https://www.choolsgroup.com/Best-](https://www.choolsgroup.com/Best-Books/Book%20Boon%20Books/IT%20%26%20Programming/Decision-making%20support%20systems_%20Theory%20%26%20practice.pdf?utm_source=chatgpt.com)

[Books/Book%20Boon%20Books/IT%20%26%20Programming/Decision-](https://www.choolsgroup.com/Best-Books/Book%20Boon%20Books/IT%20%26%20Programming/Decision-making%20support%20systems_%20Theory%20%26%20practice.pdf?utm_source=chatgpt.com)

[making%20support%20systems_%20Theory%20%26%20practice.pdf?utm_source=chatgpt.com](https://www.choolsgroup.com/Best-Books/Book%20Boon%20Books/IT%20%26%20Programming/Decision-making%20support%20systems_%20Theory%20%26%20practice.pdf?utm_source=chatgpt.com)

Subject: Economics 2

Professor in charge: Dr. György Fabricius-Ferke

Number of hours: 45

Credits: 6

Assessment: Exam

The aim of the subject:

For the students to improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements with special regard to the acquisition of general macroeconomic knowledge expected by the field, to understand the mechanisms of the main economic processes and to be able to interpret them in an appropriate way in their later work. By doing so, they should be able to understand world economic events and their national economic aspects.

Knowledge:

The concept, the subject of macroeconomics, its methods of analysis, the sectors of the national economy, the measurement, aspects and indicators of macroeconomic performance. The elements of aggregate demand, consumption function, savings function, investment demand, government demand. Commodity market equilibrium, income-expenditure model, the multiplier, the IS curve. The function of money, the demand for money, the money supply, the money market equilibrium, the money market equilibrium and the LM curve, the IS-LM model. The impact of monetary policy, fiscal policy, external shocks on aggregate demand. The basic categories and context of the labour market. The production function and the marginal product of labour, the labour demand curve, the aggregate supply curve, the labour market equilibrium. The macro-economic uniformity and the stabilization policy. Expansionary fiscal and monetary policy. Macroeconomics equilibrium and inflation, inflation and the Fisher effect, the quantitative theory of money. Inflation and unemployment, Phillips curve. An open economy, balance of payments and the foreign exchange market. The sources, process, equation of economic growth, the stimulation of the growth of crops, sustainable development. New directions in economic methodology/economic philosophy.

Competences:

The students

- will have knowledge of the basic, comprehensive concepts, theories, facts, national economic and international contexts of economics, with regard to the relevant economic actors, functions and processes;
- will have mastered the basic theories and characteristics of the micro and macro levels of organization of the economy, and is in possession of the basic methods of information collection, mathematics and statistical analysis;
- will follow and interpret the global economic and international business processes, the changes in the related policies and legislation relevant to the economic policy and the field, and their effects, and will take these into account in their analyses, proposals and decisions,

- will be receptive to new information, new professional knowledge and methodologies, and open to taking on new, independent and cooperative tasks and responsibilities.

Teaching methodology:

The curriculum is processed through lectures, seminars, and on the basis of the student's work done individually or in groups. The seminars are aimed at the practical application of theoretical knowledge, during which students solve tasks under the guidance of the instructor, process case studies, and develop and present proposals for solving problems in different situations. The processing of the curriculum is supported by modern ICT tools, self-assessment tasks, examples and other educational aids developed by the instructor.

Compulsory and Recommended Literature:

Thomas Showell: Basic Economics

ppt-s, notes and handouts from the lessons

Subject: Fundamentals of Corporate Economics

Professor in charge: Dr. László Mádi

Number of hours: 45

Credits: 6

Assessment: Exam

The aim of the subject:

For the students to improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements.

Knowledge:

The basic concepts of corporate economics, the target system, stakeholders, organizational frameworks of companies, profit-oriented and non-profit organizations. Establishment, operation and dissolution of companies. Company theories. The environment of companies. The social role of the company. Market and market conditions. The economic role of the state. Characteristics of state-owned enterprises. Alternative economics and responsible business. Globalization and its impact on the activities of companies. The role and functions of competition. Key features of key corporate activities (marketing, innovation, production and service, logistics, human resource management, finance, information and knowledge management). The impact of Industry 4.0 on corporate activity and its elements. Enterprise Resource Planning Systems. The corporate strategy and the process of its implementation

Competences:

The students

- will have knowledge of the basic, comprehensive concepts, theories, facts, national economic and international contexts of economics with regard to the relevant economic actors, functions and processes;
- will have mastered the basic theories and characteristics of the micro and macro levels of organization of the economy, and will be in possession of the basic methods of information collection, mathematics and statistical analysis;
- will be receptive to new information, new professional knowledge and methodologies, and open to taking on new, independent and cooperative tasks and responsibilities.

Teaching methodology:

The curriculum is processed through lectures, seminars, and on the basis of the student's work done individually or in groups. The seminars are aimed at the practical application of theoretical knowledge, during which students solve tasks under the guidance of the instructor, process case studies, and develop and present proposals for solving problems in different situations. The processing of the curriculum is supported by modern ICT tools, self-assessment tasks, examples and other educational aids developed by the instructor.

Compulsory and Recommended Literature: as announced by the teachers.

Attila Chikán: *Business Economics*. Akadémiai Kiadó, Budapest, Digital edition, 2020. ISBN 978 963 454 589 7

Gerry Johnson, Kevan Scholes, Richard Whittington: Exploring Corporate Strategy, 8th Edition, FT Prentice Hall

<http://books.google.hu/books?id=SmjnLQwLSdsC&printsec=frontcover&hl=hu#v=onepage&q&f=false>

Bartek-Lesi/Bartók/Czakó/Gáspár/Könczöl/Pecze: Corporate Strategy

Richard Brealey, Stewart Myers, Franklin Allen: Principles of Corporate Finance, McGraw-Hill / Irwin,

2011 <http://books.google.hu/books?id=rTKhngEACAAJ&dq=brealey+myers&hl=hu&sa=X&ei=i1n9U97kLNHmaqOQgbAF&ved=0CGIQ6AE>

Subject: General English 2

Professor in charge: Dr. Magdolna Kimmel

Number of hours: 45

Credits: 0 (zero)

Assessment: Signature

The aim of the subject:

For the students to improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements.

Knowledge:

Vocabulary Development and Grammar Skills

- Travelling; Holidays; Sights and sounds of a place;
- Story-telling; Past simple tense: regular and irregular forms.
Writing short reports.
- Flats, houses, floor-plans. Asking for and giving directions; Writing a postcard.
There is/There are; There was/There were; The Present Progressive tense; Present Simple or Present Progressive.
- Food and drinks; At a restaurant; Predicting the future;
Future plans. Countable and uncountable nouns; to be going to...; quantifiers: much, a lot etc.
- Comparing and contrasting things, people; checking out of a hotel;
Adjectives and adverbs; comparative and superlative forms of adjectives; comparative structures.

Competences:

The students

- will have, by the end of the course, recalled and strengthened their knowledge of the most basic grammatical structures, the most important functional language elements used in everyday situations, and the required vocabulary;
- will have, by the end of the course, increased their openness to foreign languages, and will have strengthened their self-confidence; language learning strategies will have improved.

Teaching methodology:

- Interactive group work with lots of pair and small group speaking opportunities;
- Simultaneous development of the four skills;
- Classroom work supported by the exploitation of the possibilities provided by the interactive whiteboard;
- Doing grammar drills at home.

Compulsory and Recommended Literature: Oxenden, C. & Latham-Koenig, C.: New English File Intermediate Student's Book and Workbook plus 4th edition online practice

Subject: Integrated Company Management Systems

Professor in charge: Dr. István Gerják

Number of hours: 45

Credits: 2

Assessment: Exam

The aim of the subject:

For the students to improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements.

Knowledge:

The relationship between corporate management and information technology. ERP systems. The SAP system as a 2nd generation ERP system. Economic processes in SAP. Basic financial concepts and functions in SAP. Financial processes in SAP. Financial reporting in SAP. Integrated accounting processes. Basic logistics concepts and functions in SAP. Logistics processes in SAP. Logistics reports in SAP. Basic concepts and functions of controlling in SAP. Controlling processes in SAP.

Competences:

The students

- will undertake and credibly represent the professional principles of their IT deployment field (company, public administration or public service organization);
- will look at their own professional competencies and activities in a reflective way;
- will strive for continuous professional training and general self-education;
- will make self-education one of the tools for achieving their professional goals.

Teaching methodology:

The curriculum is processed through lectures, seminars, and on the basis of the student's work done individually or in groups. The seminars are aimed at the practical application of theoretical knowledge, during which students solve tasks under the guidance of the instructor, process case studies, and develop and present proposals for solving problems in different situations. The processing of the curriculum is supported by modern ICT tools, self-assessment tasks, examples and other educational aids developed by the instructor.

Compulsory and Recommended Literature:

Bourgeois, D. T., Smith, J. L., Wang, S., & Mortati, J. (2019). *Information systems for business and beyond*. Open Textbook Library.

<https://open.umn.edu/opentextbooks/textbooks/information-systems-for-business-and-beyond>

Fleischmann, A., Oppl, S., Schmidt, W., & Stary, C. (2020). *Contextual process digitalization: Changing perspectives – design thinking – value-led design*. Springer, Cham.

<https://link.springer.com/book/10.1007/978-3-030-38300-8>

Subject: Linear Algebra

Professor in charge: Dr. István Gerják

Number of hours: 30

Credits: 5

Assessment: Exam

The aim of the subject:

For the students to improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements.

Knowledge:

Vectors. Systems of linear equations and their solutions. Solvability and space for solutions. Definitions of matrix operations. Properties of matrix operations. Determinant. Matrix mappings and their geometry. Intrinsic value, diagonalization. Singular value. Jordan's normal form. Non-negative matrices.

Competences:

The students

- will know and understand the basic concepts and relationships of analysis, probability theory, linear algebra, operations research, statistics and computer science, as well as the formal models of routine problems related to the fields of application;
- will strive for continuous professional training and general self-education;
- will make self-education one of the tools for achieving their professional goals.

Teaching methodology:

The curriculum is processed through lectures, seminars, and on the basis of the student's work done individually or in groups. The seminars are aimed at the practical application of theoretical knowledge, during which students solve tasks under the guidance of the instructor, process case studies, and develop and present proposals for solving problems in different situations. The processing of the curriculum is supported by modern ICT tools, self-assessment tasks, examples and other educational aids developed by the instructor.

Compulsory and Recommended Literature:

Gilbert Strang: Linear Algebra and Its Applications, Fourth Edition

Subject: Mathematics 2

Professor in charge: Dr. Imre Balogh

Number of hours: 45

Credits: 6

Assessment: Exam

The aim of the subject:

For the students to improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements. with special regard to the acquisition of the mathematical knowledge necessary for the subsequent operation of artificial intelligence and the ability to integrate them into professional subjects.

Knowledge:

The concept of probability, axioms and theorems of probability theory, classical formula. Sampling. Conditional probability, multiplication rule. The absolute probability theorem, Bayes' theorem. Independence of events. Discrete and continuous random variables. Notable distributions. Central boundary distribution theorem. Chebyshev's inequality, the law of large numbers. Multidimensional distributions. Two-dimensional random variable and its expected value, covariance, correlation coefficient, conditional probability distribution. Regression function. Economic applications.

Competences:

The students

- will possess the basic methods of information gathering and mathematical analysis;
- by applying the theories and methods learned, will be able to explore, systematize and analyse facts and fundamental connections;
- will be receptive to new information, new professional knowledge and methodologies, and open to taking on new, independent and cooperative tasks and responsibilities;
- will take responsibility for their analyses, conclusions and decisions.

Teaching methodology:

The curriculum is processed through lectures, seminars, and on the basis of the student's work done individually or in groups. The seminars are aimed at the practical application of theoretical knowledge, during which students solve tasks under the guidance of the instructor, process case studies, and develop and present proposals for solving problems in different situations. The processing of the curriculum is supported by modern ICT tools, self-assessment tasks, examples and other educational aids developed by the instructor.

Compulsory and Recommended Literature:

university lecture notes, compiled by the professor in charge, Dr. Imre Balogh

Subject: Programming 2

Professor in charge: Dr. István Gerják

Number of hours: 45

Credits: 3

Assessment: Mid-term grade

The aim of the subject:

For the students to improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements.

Knowledge:

Define and use functions; parameter, argument, return value

Functions: Euclidean algorithm with iteration and recursion

– file management: creating, writing, reading, binary and text files

– A longer example of a backtrack algorithm, also with iteration and recursion

– debugging, introduction and use of the pdb module of Python, presentation of a graphical interface tool

– The basic features of object-orientation: unification, inheritance, polymorphism; inheritance and aggregation

– Simple examples for defining and using in class

Web applications:

– a Common Gateway Interface (CGI)

– HTTP, TCP/IP, HTML at a glance

– the cgi module of Python; Examples of a dynamically changing website, a page suitable for dialogue, file download, cooperation between a web server and a database manager

Competences:

The students

- will know the basic programming structures in the context of programming, the methodology of software development and the most important programming environments;
- will have basic knowledge of all areas of information management, including IT strategy, process management, system development, knowledge management, IT service management, project management, risk management, performance management, IT asset management, IT security and IT audit.

Teaching methodology:

The curriculum is processed through lectures, seminars, and on the basis of the student's work done individually or in groups. The seminars are aimed at the practical application of theoretical knowledge, during which students solve tasks under the guidance of the instructor, process case studies, and develop and present proposals for solving problems in different situations. The processing of the curriculum is supported by modern ICT tools, self-assessment tasks, examples and other educational aids developed by the instructor.

Compulsory and Recommended Literature:

B Downey, A. (2015). Think Python: How to Think Like a Computer Scientist-2e.

<https://greenteapress.com/wp/think-python-2e/>

Klein, B. (2020). Applied Python. Bodenseo.

https://python-course.eu/material/applied_python.pdf

Subject: Project Work 2

Professor in charge: Dr. Rózsa Horváth-Bokor

Number of hours: 15

Credits: 2

Assessment: Mid-term grade

The aim of the subject:

For the students to improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements.

Knowledge:

In the framework of the project work subject, students develop a solution to solve a specific business informatics problem. During the work, the learned knowledge and methods are applied in a targeted manner, adapted to the project, and then the achieved results are presented.

Competences:

The students

- will be able to understand and analyse business processes, prepare and perform the requirement specification of software applications supporting implementation, and perform simple programming tasks;
- will plan and manage small development projects.

Teaching methodology:

The instructor helps the planning and implementation of the project with consultation and suggestions.

Compulsory and Recommended Literature:

Hamlin, A., Rubio, C., & DeSilva, M. (2017). *Technical writing*. Open Oregon Educational Resources.

<https://open.umn.edu/opentextbooks/textbooks/412>

Last, S. (2019). *Technical writing essentials: Introduction to professional communications in the technical fields*. University of Victoria.

<https://rwu.pressbooks.pub/writing311/chapter/collaborativewriting/>

Subject: Quality Management and IT

Professor in charge: Dr. Rózsa Horváth-Bokor

Number of hours: 30

Credits: 3

Assessment: Mid-term grade

The aim of the subject:

For the students to improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements.

Knowledge:

Quality and IT. A modern interpretation of the concept of quality. Quality of software products and software processes. Software process models. Procedures for modelling computer applications. Software maturity model. Standards for software product quality. Requirement specifications. Refactoring. Unit tests. Software process standards, due diligence, process improvement. Software metric. The personal background of software development. Coding standards.

Competences:

The students

- will have general knowledge of the regulatory issues and problems of the information society;
- will accept and adapt to the work and organizational culture of their environment, and will adhere to the ethical principles of the profession;
- will look at their own professional competencies and activities in a reflective way;
- will strive for continuous professional training and general self-education.

Teaching methodology:

The curriculum is processed through lectures, seminars, and on the basis of the student's work done individually or in groups. The seminars are aimed at the practical application of theoretical knowledge, during which students solve tasks under the guidance of the instructor, process case studies, and develop and present proposals for solving problems in different situations. The processing of the curriculum is supported by modern ICT tools, self-assessment tasks, examples and other educational aids developed by the instructor.

Compulsory and Recommended Literature:

Tuffley, D. (2025). *InfoTech Governance, Policy, Ethics & Law*. Griffith University.

<https://griffithuniversity.pressbooks.pub/infotech-governance-policy-ethics/>

Goericke, S. (2020). *The future of software quality assurance*. SpringerOpen.

<https://link.springer.com/book/10.1007/978-3-030-29509-7>

Subject: Software Technology

Professor in charge: Dr. István Gerják

Number of hours: 30

Credits: 2

Assessment: Exam

The aim of the subject:

For the students to improve their competences through the knowledge, skills and attitudes as specified in the training and output requirements. Students should have an overview of the entire development process, including development, project management, and support processes. Gain in-depth knowledge of the core program lifecycle and process improvement models and standards.

Knowledge:

Software and software development. The principles of software development. Processes, their definitions, and components. Object-oriented design principles and OO concepts. A popular modelling language: UML. The application of UML elements in the software development process. UML: Use Case Diagram, Activity Diagram, Component Diagram, Deployment Diagram. UML: Class Diagram, Package Diagram, Object Diagram. UML: Sequence Diagram, Communication Diagram, Interaction Overview Diagram. UML: State Machine Diagram, Timing Diagram, Composite Structure Diagram, Profile Diagram. Beyond UML: MOF, XMI, OCL. Software development processes. Popular lifecycle models (waterfall, iterative, incremental, spiral models, RUP). The V-model and the ISO 12207 standard. Traditional and agile software development. Agile and Lean principles. Scrum and XP. Process improvement models. Elements, goals, practices. Process groups: development, management, and support processes. Popular process improvement models: CMMI, SPICE, Automotive SPICE, TMM. Requirements management. The importance of requirements. Requirements development, requirements specification. Sources of requirements. Requirements assessment, analysis, and prioritization. Planning and implementation. Definitions. The planning and implementation process. Testing. Classification of tests. Basic testing techniques. Management aspects of software projects. Supporting processes in software development.

Competences:

The students

- will be familiar with the basic programming structures, the methodology of software development and the most important programming environments in the context of programming;
- will have basic knowledge of all areas of information management, including IT strategy, process management, system development, knowledge management, IT service management, project management, risk management, performance management, IT asset management, IT security and IT audit;
- will look at their own professional competencies and activities in a reflective way;
- will strive for continuous professional training and general self-education,
- will make self-education one of the tools for achieving their professional goals.

Teaching methodology:

The curriculum is processed through lectures, seminars, and on the basis of the student's work done individually or in groups. The seminars are aimed at the practical application of theoretical knowledge, during which students solve tasks under the guidance of the instructor, process case studies, and develop and present proposals for solving problems in different situations. The processing of the curriculum is supported by modern ICT tools, self-assessment tasks, examples and other educational aids developed by the instructor.

Compulsory and Recommended Literature:

Lara, L. (2024). Handbook of Software Engineering Methods.

<https://open.umn.edu/opentextbooks/textbooks/1557>

Gruhn, V., & Striemer, R. (2018). *The Essence of Software Engineering*. Springer, Cham.

<https://link.springer.com/book/10.1007/978-3-319-73897-0>