Course descriptions

Study programme: Advanced Data Analytics in Business

Course name: Programming for business applications

Lecturers: Marko D. Petković

Course status: Obligatory

Numebrs of ECTS credits: 6

Precondition: none

Aims of the course

Introduction to programming algorithmic approach to problem solving.

Learning outcomes

Students will be familiar with fundamental algorithmic templates as well as basics of programming in Python.

Content of the course

Theoretical lectures

Introduction: Basics of programming, precise formulation of the problem and methods for its solving, splitting the complex problem to easier subproblems, notion of algorithms and basic characteristics.

Introduction to programming in Python: installation of Python and additional packages (pip), python IDEs (PyCharm, Spyder, Jupyter), variables and data types, assignment statement, parsing variables from input, output formats for different data types, If statement, loops, tuples and lists, basic operations with tuples and lists, functions, function parameters, recursion, global variables, lambda expressions, sets and dictionaries with basic operations, file management.

Applications of Python in business analytics: Numerical computations (numpy and scipy), optimization problems (scipy.optimize, mip), decision theory, statistics and elementary data processing (pandas), advanced and intelligent data processing (skilearn), documents manipulation (Word, Excel, PDF).

Practical course work

Practical work in computer classroom. Practical exercises on the topics covered by lectures.

Literature

1. Al Sweigart, Automate the Boring Stuff with Python, No Starch Press, San Francisco, 2015.

2. Jaan Kiusalaas, Numerical methods in engineering with Python 3, Cambridge University Press, 2013.

3. John Hunt, Advanced guide to Python 3 programming, Springer, 2019.

Number of active teaching classes	**Lecturing: 30**	**Practical course work: 30**

Learning activities methods

Knowledge assessment (maximum100 points)

Pre-exam activities	points	**Exam results**	Points
Participation in lecturing classes	10	Written exam	0
Paricipation in practical course work	10	Oral exam	50
Colloquium		*Project presentation*	
Paper work - case study			

Study programme: Advanced Data Analytics in Business

Course name: Introduction to Machine Learning in Business

Lecturers: Marko Milojković, Miroslav Milovanović

Course status: Core subject

Number of ECTS credits: 6

Precondition: None

Aims of the course

Modern business heavily depends on extracting commercial value from the vast amount of available data. This course aims to provide students an introduction to machine learning techniques that are the core of modern data analytics.

Learning outcomes

Students will be able to conduct independent research using various machine learning methods, focusing on economic applications.

Content of the course

Theoretical lectures

The course will cover leading machine learning methods, emphasizing the challenges and opportunities of integrating these methods in empirical economics. The various topics are illustrated through applications, reading empirical articles, and doing applied work. Students will be trained in the following specific topics: big data analytics, preparing data for modelling, basics of machine learning, and various machine learning methods (regression methods, nearest neighbours classifiers, decision trees, random forest, neural networks).

Practical course work

All computing in class will be conducted in Python. Students will be trained with case studies in the domain of economics: predicting economic growth, estimating the price of real estate, predicting trends in the stock market, loan default prediction.

Literature

1. Atin Basuchoudhary, James T. Bang, Tinni Sen (2017) Machine-learning Techniques in Economics - New Tools for Predicting Economic Growth, Springer, ISBN 978-3-319-69013-1
2. Matthew F. Dixon, Igor Halperin, Paul Bilokon (2020) Machine Learning in Finance - From Theory to Practice, Springer, ISBN 978-3-030-41067-4
3. Sebastian Raschka, Vahid Mirjalili (2017), Python Machine Learning - Second Edition: Machine Learning and Deep Learning with Python, scikit-learn, and TensorFlow, Packt, ISBN 978-1787125933

Number of active teaching classes	**Lecturing: 30**	**Practical course work: 30**

Learning activities methods

Presentation, dialogue, graphics, programming language demonstration, indvidual work.

Knowledge assessment (maximum 100 points)

Pre-exam activities	Points	**Exam results**	Points
Participation in lecturing classes	10	Written exam	25
Participation in practical course work	10	Oral exam	25
Colloquium		Project presentation	
Paper work - case study	30	***Total***	***100***

Study programme:Advanced Data Analytics in Business

Course name: Optimization and Business Decision-Making

Lecturers: Jelena J. Stanković, Jason Papathanasiou

Course status: Core subject

Numberof ECTS credits: 6

Precondition: None

Aims of the course

Introducing students to operation research and decision theory methods and models used in business and economics and their training for independent empirical research in this area.

Learning outcomes

Students will be trained to apply linear programming modelling, as well as multi-criteria analysis methods in all areas of business. Through practical examples and the use of Python as an appropriate programming language, students will be able to conduct independent research and solve case-study problems.

Content of the course

Theoretical lectures

Linear programming optimization: Course starts with the concept and formulation of linear programming, followed by optimization methods and sensitivity analysis. During the course, some linear programming examples are explored, starting with some very basic mathematical theory behind the simplex method and moving on to some real-world examples. During the course we'll be using Python and a linear programming optimization packages PuLP and Pyomo.
Multi-criteria analysis: The course studies the basic concepts of multicriteria analysis, model formulation and three methods for solving this type of problem - AHP, TOPSIS, PROMETHEE and VIKOR. During the classes, practical examples will be solved using the Python programming language.

Practical course work

Application of optimization and business decision-making methods and models on empirical data by employing the programming language Python in order to provide practical knowledge that will enable students to solve real-case problems and obtain adequate conclusions. Other software that can be used is MS Excel and Visual PROMETHEE.

Literature

1. Barry Render, Ralph M. Stair Jr., Michael E. Hanna, Trevor S. Hale (2017) Quantitative Analysis for Management, Global Edition, Pearson, ISBN-13: 978-1292217659 (Chapter 7 and Chapter 8)
2. Jason Papathanasiou, Nikolaos Ploskas (2018) Multiple Criteria DecisionAid - Methods, Examples andPython Implementations, Series Springer Optimization and Its Applications, ISBN 978-3-319-91646-0, Springer International Publishing (Chapter 1, Chapter 2, Chapter 3 and Chapter 5)
3. Hart, W.E., Laird, C.D., Watson, J.-P., Woodruff, D.L., Hackebeil, G.A., Nicholson, B.L., Siirola, J.D. (2017) Pyomo — Optimization Modeling in Python, Series Springer Optimization and Its Applications, Springer International Publishing (Part I An Introduction to Pyomo)

Number of active teaching classes	**Lecturing: 30**	**Practical course work: 30**

Learning activities methods

Presentation, dialogue, graphics, programming language demonstration, indvidual work.

Knowledge assessment (maximum100 points)

Pre-exam activities	Points	**Exam results**	Points
Participation in lecturing classes	10	Written exam	40
Participation in practical course work	10	Oral exam	0
Colloquium	20	Project presentation	10
Paper work-case study	10	***Total***	***100***

Study programme: Advanced Data Analytics in Business

Course name: Reseach Design and Data Visualization Tchniques

Lecturers: Ognjen Radović, Jovica Stanković, Ivana Maković

Course status: Core

Numebrs of ECTS credits: 6

Precondition:

Aims of the course

Introduction to the basics of research planning, graphical presentation of data and research results.

Learning outcomes

Students will be introduced to the basics of research planning and visual presentation of data in programming languages Python and R.

Content of the course

Theoretical lectures

Research planning: selection, collection and verification of data for qualitative and quantitative research methods.

Basics of data visualization: Defining data visualization, data visualization process, development of interactivity and composition of visual solution for data presentation.

Application of Python language in the presentation of business data: creation of basic chart types, creation of advanced charts. Introduction to pygal, Matplotlib, Plotly library.

Application of the R language in the presentation of business data: development of basic chart types, development of advanced charts. Introduction to the ggplot2 library.

Practical course work

Exercises in the computer center. Examples will be processed and implemented in accordance with the theoretical teaching.

Literature

1. Kirk,Andy, *Data Visualisation: A Handbook for Data Driven Design*, 2nd Edition, SAGE Publications Ltd, 2019.

2.Embarak,Ossama, *Data Analysis and Visualization Using Python*, Apress, 2018.

3. Eric Goh Ming Hui, *Learn R for Applied Statistics*, Apress, 2019.

Number of active teaching classes: 60	**Lecturing: 30**	**Practical course work: 30**

Learning activities methods

Interactive lectures and exercises in the computer classroom.

Knowledge assessment (maximum100 points)

Pre-exam activities	points	**Exam results**	Points
Participation in lecturing classes	10	Written exam	50
Paricipation in practical course work	10	Oral exam	0
Colloquium	20	*Project presentation*	0
Paper work-case study	10		

Study programme: Advanced Data Analytics in Business

Course name: Marketing intelligence

Lecturers: Vinko Lepojević, Vesna Janković-Milić

Course status: Core

Number of ECTS credits: 6

Precondition: Mathematics and Statistics in Business Analysis

Aims of the course

Familiarize students with the most common analytical tools in market intelligence and marketing research and qualify students who have already ruled the logic of statistical thinking to independently conduct marketing research and analysis.

Learning outcomes

Students will become familiar with specific marketing research techniques for analyzing data once it has been collected and using those analyses to make better management decisions. Also, students will be able to use programming languages R and Python for marketing research and analysis.

Content of the course

Theoretical lectures

Marketing research, Data, samples and statistical tests, Relationships between variables, Multivariate analysis methods, Multivariate analysis of variance, Principal component analysis, Exploratory factor analysis, Confirmatory factor analysis, Discriminant analysis, Cluster analysis.

Practical course work

Application of multivariate analysis methods on concrete data using programming languages R and Python.

Literature

1. Winston, L., W., (2014). *Marketing Analytics*, John Wiley & Sons, Inc
2. Chapman, C., Mc Donnell Feit, E. (2015). *R for Marketing research and Analytics*, Springer International Publishing Switzerland.
3. Schwarz, J., Chapman, C., Mc Donnell Feit, E. (2020). *Python for Marketing research and Analytics*, Springer International Publishing Switzerland.
4. Miller, W., T., (2015). *Marketing Data Science – Modelling Techniques in Predictive Analytics with R and Python*, Pearson.

Number of active teaching classes	**Lecturing: 30**	**Practical course work: 30**

Learning activities methods

Presentation, dialogue, graphics, programming language demonstration, indvidual work.

Knowledge assessment (maximum100 points)

Pre-exam activities	points	**Exam results**	Points
Participation in lecturing classes	10	Written exam	
Paricipation in practical course work	10	Oral exam	
Colloquium	20	*Project presentation*	50
Paper work-case study	10		

Study programme: Advanced Data Analytics in Business

Course name: Mathematics and Statistics in Business Analysis

Lecturers: Žarko Popović, Vinko Lepojević, Vesna Janković-Milić

Course status: Elective

Number of ECTS credits: 6

Precondition:

Aims of the course

Introducing students to the basic concepts, models and methods in mathematics and statistics and their training for the application of acquired knowledge in various fields of economics.

Learning outcomes

Use of mathematical methods and accompanying software packages for discrete and dynamic analysis of models used to solve specific economic and organizational problems.
Calculation and correct interpretation of basic statistical indicators, mastering the basic statistical methods and commenting on the obtained results, using appropriate software packages.

Content of the course

Theoretical lectures

Elements of number heory, Elements of discrete mathematics, Elements of linear algebra, Linear vector space, Matrices, Systems of linear equations, Elements of mathematical analysis, Limit value and continuity, Derivation, Integration, Elements of numerical mathematics.

Descriptive statistics, Random variables and their distribution, Statistical inference, Analysis of variance, Chi-square tests, Simple regression and Correlation, Multile Regressiona Analysis.

Practical course work

Solving simple tasks and examples from practice with active work on the computer.

Literature

1. Rice, A. J. (2017) *Mathematical Statistics and Data Analysis*, Thompson Higher Education, USA.
2. Brooks, C. M. (2009) *Introductory Econometrics for Finance*. Cambridge University Press.
3. Barnett, R.,Zeigler, M., Byleen, K.(2011) *Applied mathematics for business, economics, life sciences and social sciences*, Pearson Education Limited.
4. Mavron, V. C, Phillips, T. N. (2010) *Elements of Mathematics for Economics and Finance*, Springer-Verlag London.

Number of active teaching classes	**Lecturing: 30**	**Practical course work: 30**

Learning activities methods

Presentation, dialogue, graphics, indvidual work.

Knowledge assessment (maximum100 points)

Pre-exam activities	points	**Exam results**	Points
Participation in lecturing classes	10	Written exam	*0*
Paricipation in practical course work	10	Oral exam	*0*
Colloquium	20	*Project presentation*	50
Paper work-case study	10	***Total***	***100***

Study programme: Advanced Data Analytics in Business

Course name: Time Series Forecasting

Lecturers: Vinko Lepojević, Vesna Janković-Milić

Course status: Core

Numebrs of ECTS credits: 6

Precondition: Pre-course Mathematics and Statistics in Business Analysis

Aims of the course

Introducing students to the basic concepts, models and methods in time series analysis and forecasting and their training for the application of acquired knowledge in various fields of economics.

Learning outcomes

After this course students will be able to:

- Use R to perform calculations with time and date based data;
- Create models for time series data;
- Use models for forecasting;
- Identify which models are suitable for a given dataset;
- Visualize time series data;
- Transform standard data into time series format;
- Clean and pre-process time series;
- Create ARIMA and exponential smoothing models,
- Identify the best time series libraries for a given problem;
- Compare the accuracy of different models.

Content of the course

Theoretical lectures

Working with data sets and time in R, Time Series Data Pre-Processing and Vizualization, Statistical Background for Time Series Analysis and Forecating, ARIMA models, Multivariate Time Series Analysis, Neural Networks in Time Series Analysis.

Practical course work

Application of time series analysis and forecasting methods on concrete data using programming language R

Literature

5. Brooks, C. M. (2009). *Introductory Econometrics for Finance*. Cambridge University Press.
6. Cowpertwait, Paul S.P., Metcalfe, Andrew V. (2009). *Introductory Time Series with R*, Springer Science+Business Media.
7. Shmueli, G., Lichtendahl Jr, K.C. (2018). *Practical Time Series Forecasting with R: A Hands-On Guide* [2nd Edition], Axelrod Schnall Publishers.

Number of active teaching classes	**Lecturing: 30**	**Practical course work: 30**

Learning activities methods

Presentation, dialogue, graphics, programming language demonstration, indvidual work.

Knowledge assessment (maximum100 points)

Pre-exam activities	points	**Exam results**	Points
Participation in lecturing classes	10	Written exam	
Paricipation in practical course work	10	Oral exam	
Colloquium	20	*Project presentation*	50
Paper work-case study	10		

Study programme: Advanced Data Analytics in Business

Course name: Applied Econometrics

Lecturers: Žarko Popović, Jelena Stanković

Course status: Core subject

Number of ECTS credits: 6

Precondition:

Aims of the course

Introducing students to econometric methods and models used in business and economics and their training for independent empirical research in this area.

Learning outcomes

Students will be trained to apply econometric modelling in all areas of business. Through practical examples and the use of appropriate programming language, students will be able to conduct independent econometric research.

Content of the course

Theoretical lectures

Classical econometric analysis: classical linear regression model - assumptions, estimation methods, testing of deviations from the assumptions of the classical linear regression model and model stability tests.

Econometric analysis of panel data: fixed and random effects models - assumptions and evaluation methods, tests and model selection, testing of deviations from the assumptions, methods of instrumental variables, dynamic panel models.

Econometric analysis of models with discrete dependent variable: binary choice models, probit and logit, marginal effects, specification tests and multiple-choice models.

Practical course work

Application of econometric methods and models on empirical data in the computer centre by employing the programming language Rfor students to learn to obtain adequate conclusions.

Literature

1. Asteriou, D., & Hall, S. G. (2015). *Applied econometrics*. Macmillan International Higher Education.

2.Kleiber, C., & Zeileis, A. (2008). *Applied econometrics with R*. Springer Science & Business Media.

3. Croissant, Y., & Millo, G. (2019). *Panel data econometrics with R*. John Wiley and Sons, Incorporated.

4. Heiss, F. (2020). *Using R for Introductory Econometrics* (2nd edition). Independently published.

Number of active teaching classes	**Lecturing: 30**	**Practical course work: 30**

Learning activities methods

Interactive lectures, individual work

Knowledge assessment (maximum100 points)

Pre-exam activities	points	**Exam results**	Points
Participation in lecturing classes	10	Written exam	50
Participation in practical course work	10	Oral exam	0
Colloquium	20	Project presentation	0
Paper work-case study	10	**Total**	**100**

Study programme: Advanced Data Analytics in Business

Course name: Quantitative Finance

Lecturers: Srđan Marinković, Professor

Course status:

Numebrs of ECTS credits: 6

Precondition: basic or intermediate knowledge in finance and economics, mathematical and computation literacy.

Aims of the course is to extend undergraduate students' knowledge about financial market analytics as well as practitioners' understanding of various segments of financial markets: bond, stock and derivative assets market.

Learning outcomes. Capability to do analysis and based investment and financial decision making on quantitative data. Ability to extract information about transaction prices, yields and turnover data from relevant markets and data vendors, as well as to process information for making decisions related to securities investments (time series models, linear and nonlinear models, numerical procedures).

Content of the course

Theoretical lectures:The role of finance and financial instruments (direct and intermediary finance, exchange and OTC markets); Types of financial instruments, securities and contracts (short-term securities, bonds, stocks and derivatives); Financial market data (closing prices, volume and return data, data sources and vendors); Basic concept in financial assets valuation (NPV, IRR); Interest rates and bond valuation (yield curve, bond price, bond duration and convexity); Portfolio management (CAPM and security market line, APT, portfolio optimization); Foreign exchange market and models; Introduction to option theory (European call and put options, American options, option pricing).

Practical course work: Data visualisation (plotting price and volume charts, daily percentage returns and cumulative returns,histograms and volatility charts); Time series analysis (Q-Q plots, correlation matrix, moving averages); Basic concept in valuation (calculation of NPV, IRR); Fixed-coupon mathematics (valuing zero-coupon bond using Python, bootstrapping yield curves, calculating forward rates from the yield curve, calculating the yield to maturity, proce of a bond and duration). Portfolio optimization (solving for the security market line using regression, multivariate linear regression and APT model, linear optimization in portfolio allocation); Nonlinear models (Markov regime switching model with real data on exchange rate; Pricing european options).

(While the lectures are devoted to discussing mainstream theory, the assignments serve to solve specific computational problems. It is advisable to work in groups closely monitored by course instructors).

Literature

1. James Ma Weiming (2019) *Mastering Python for Finance*, Packt Publishing, 2nd edition.
2. Yan Yuxing (2014) *Python for Finance: Build real-life Python applications for quantitative finance and financial engineering*. Packt Publishing.
3. David Blake (2002) *Financial market analysis*, John Willey and Sons, Chichester;
4. John Hull (2017) *Option, futures and other derivatives*, Pearson, 10th edition.

Number of active teaching classes	**Lecturing: 30**	**Practical course work: 30**

Learning activities methods

Knowledge assessment (maximum100 points)

Pre-exam activities	points	**Exam results**	Points
Participation in lecturing classes	10	Written exam	
Paricipation in practical course work	10	Oral exam	
Colloquium		*Project presentation*	
Paper work-case study			

Study programme: Advanced Data Analytics in Business

Course name: Programming for business applications 2

Lecturers: Marko D. Petković

Course status: elective

Numebrs of ECTS credits: 6

Precondition: none

Aims of the course

Introduction to basic and advanced programming techniques for statistical data analysis.

Learning outcomes

Students will be familiar with practical applications of basic and advanced methods for statistical data analysis as well as the basics of programming in R.

Content of the course

Theoretical lectures

Introduction: Introduction to R, installation and packages, IDE-s (RStudio, PyCharm, etc.), variables and data types. assignment statement and loops, functions and parameters, strings and operations on strings.

Data analysis in R: File manipulations, data cleaning, basic distributions and corresponding R functions, descriptive statistics, linear regression, hypothesis testing, ANOVA, data visualization.

Advanced data analysis in R: clusterization, decision trees, Bayesian analysis, neural networks.

Practical course work

Practical work in computer classroom. Practical exercises on the topics covered by lectures.

Literature

1. G. Grolemund, H. Wickham, R for Data Science, O'Reilly 2017.

2. Y. Xie, J.J. Allaire, G. Grolemund, R Markdown: The Definitive Guide, CRC Press 2020.

3. A. Field, J. Miles, Z. Field, Discovering Statistics Using R, SAGE Publications Ltd 2012.

Number of active teaching classes	**Lecturing: 30**	**Practical course work: 30**

Learning activities methods

Knowledge assessment (maximum100 points)

Pre-exam activities	points	**Exam results**	Points
Participation in lecturing classes	10	Written exam	0
Paricipation in practical course work	10	Oral exam	50
Colloquium		*Project presentation*	
Paper work - case study			

Study programme: Advanced Data Analytics in Business

Course name: Advanced Big Data Analytics

Lecturers: Ognjen Radović, Jovica Stanković, Ivana Maković

Course status: Core

Numebrs of ECTS credits: 6

Precondition:

Aims of the course

Introducing students to the basics of advanced business data analytics.

Learning outcomes

Students will be introduced to the advanced data analytics and Big Data concept using the Python and R programming languages.

Content of the course

Theoretical lectures

Business data analytics: Fundamentals of Big Data analytics, data analytics life cycle, advanced analytical models: clustering, classifications, time series.

Application of Python language: Business analytics and simulation models. Introduction to the PySpark library.

Advanced data analytics in R: Introduction to MapReduce and Hadoop, work with large databases, supervised and unsupervised learning.

Practical course work

Exercises in the computer center. Examples will be processed and implemented in accordance with the theoretical teaching.

Literature

1. EMC Education Services, *Data Science & Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data*, John Wiley & Sons, Inc., 2015.

2.Giuseppe Ciaburro,*Hands-On Simulation Modeling with Python*, Packt Publishing Ltd, 2020.

3.Saizet al., *An Introduction to DataAnalysis in R: Hands-on Coding, Data Mining, Visualizationand Statistics from Scratch*, Springer, 2020.

Number of active teaching classes: 60	**Lecturing: 30**	**Practical course work: 30**

Learning activities methods

Interactive lectures and exercises in the computer classroom.

Knowledge assessment (maximum100 points)

Pre-exam activities	points	**Exam results**	Points
Participation in lecturing classes	10	Written exam	50
Paricipation in practical course work	10	Oral exam	0
Colloquium	20	*Project presentation*	0
Paper work-case study	10		

Study programme: Advanced Data Analytics in Business			
Course name: Online Business and Web Analytics			
Lecturers: Marko Milojković, dodati drugo ime			
Course status: Elective			
Number of ECTS credits: 6			
Precondition: None			
Aims of the course To provide students basic data analytic knowledge applied in analysing online business, social media and web contents.			
Learning outcomes Students will be able to preform independent analysis of web data and obtained conclusions related to potential improvements of sales, product range, customer relations and digital marketing strategies.			
Content of the course *Theoretical lectures* *Practical course work*			
Literature 1.			
Number of active teaching classes	**Lecturing: 30**	**Practical course work: 30**	
Learning activities methods			
Knowledge assessment (maximum100 points)			
Pre-exam activities	points	**Exam results**	Points
Participation in lecturing classes	10	Written exam	
Paricipation in practical course work	10	Oral exam	
Colloquium		*Project presentation*	
Paper work - case study			

Study programme: Advanced Data Analytics in Business

Course name: Data Acquisition in Business Intelligence

Lecturers: Ognjen Radović, Jovica Stanković, Ivana Maković

Course status: Core

Numebrs of ECTS credits: 6

Precondition:

Aims of the course

Introduction to the basics of data acquisition from various sources and its importance for business analytics.

Learning outcomes

Students will be introduced to the basics of data acquisition from different sources using Python and R programming languages.

Content of the course

Theoretical lectures

Basics of data acquisition: The importance of data acquisition in business intelligence, basics of data analytics and machine learning, introduction to different Hadoop models.

Application of Python language in business data acquisition: data extraction from different formats SQL, XLS, HTML.

Application of R language in business data acquisition: Introduction to Hadoop, data analytics in R programming language, data extraction from MySQL, Excel, MongoDB, Hive.

Practical course work

Exercises in the computer center. Examples will be processed and implemented in accordance with the theoretical teaching.

Literature

1. Arshdeep Bahga & Vijay Madisetti, *Big Data Analytics: A Hands-On Approach*, Bahga & Madisetti, 2016.

2. EMC Education Services, *Data Science & Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data*, John Wiley & Sons, Inc., 2015.

3. Vignesh Prajapati, *Big Data Analytics with R and Hadoop*, Packt Publishing, 2013.

Number of active teaching classes: 60	**Lecturing: 30**	**Practical course work: 30**

Learning activities methods

Interactive lectures and exercises in the computer classroom.

Knowledge assessment (maximum100 points)

Pre-exam activities	points	**Exam results**	Points
Participation in lecturing classes	10	Written exam	50
Paricipation in practical course work	10	Oral exam	0
Colloquium	20	*Project presentation*	0
Paper work-case study	10		

Study programme: Advanced Data Analytics in Business

Course name: Academic writing

Lecturers:

Course status:

Numebrs of ECTS credits: 6

Precondition: Competency in standard English language

Aims of the course
To develop and strengthen academic and professional writing skills of students. To improve reading, critical reasoning and research skills. To enable students to write academic and professional articles with confidence and skill. To introduce fundamental concepts of academic writing, text analysis and critical reasoning.

Learning outcomes
Students will be able to:
- compose individual essays, based on evidence, sources and appropriate writing strategies to support topic statements;
- demonstrate critical thinking and reading skills;
- enhance the ability of text summarisation and analysis;
- evaluate and use academic sources, avoid plagiarism and cite accurately.

Content of the course
Theoretical lectures
Strategies and skills of academic reading; The writing process: topic selection, developing ideas and focus; Paper structure; Drafting and revising; Text analysis; Academic and professional sources; Literature review; Avoiding plagiarism; Clarity and exactness; Critical presentation.
Practical course work
Research assignment: research proposal, outline, draft; paragraph form and substance; citation practice and plagiarism; source evaluation; research analysis. Critical review - critical reading, analysis and writing evaluation of a scientific text.

Literature
1. **Harvard Guide to Using Sources: A Publication of the Harvard College Writing Program.**
2. **A Short Guide to College Writing, 5th edition, by Barnet, Bellanca, and Stubbs.**

Number of active teaching classes	**Lecturing: 30**	**Practical course work: 30**

Learning activities methods
Discussion, mini projects, reading strategy practice, writing assignments, presentations

Knowledge assessment (maximum100 points)

Pre-exam activities	points	**Exam results**	Points
Participation in lecturing classes	10	Written exam	*50*
Paricipation in practical course work	10	Oral exam	
Reading assignments	10	*Project presentation*	
Writing assignment (essay)	20		