QUALIFICATION CHARACTERISTICS
Of the "Bussines Informatics And Econometrics" FOR
DEGREE "MASTER "
With professional qualification " Master in Informatics"
1 YEAR (2 SEMESTERS)

I. Requirements for professional skills and competencies for enrolled students

Students accepted for training in this specialty must present diplomas degree in "Informatics" in degree "Bachelor". The procedure for submission of documents and admission is determined by the Faculty of Mathematics and Natural Sciencies.

II. Requirements for professional skills and competencies of graduates

SWU " Neofit Rilski" prepare qualified specialists in informatics who can apply their knowledge and skills in science , culture, education and economy in southwestern Bulgaria , the country and abroad.

In specialty "Businessinformatics and Econometrics" students acquire skills and knowledge for the development of application software and application software technology in business. Higher education is achieved based on a wide range of courses. Advanced preparation of students of a material provided with computer equipment of last generation software products that meet the requirements of the 21st century.

In the one-year program computer science in the study of mathematical models in economics, modern computer equipment , deployment and implementation of software and information technologies, modern methods and systems design , development and implementation of software in business are covered and basic knowledge required.

Upon completion of this degree students can work as programmers in software development, system administrators in various areas of business, government and public administration, financial institutions and banks, private companies, educational and health institutions, brokerages and others, developers, software engineers and systems administrators and others.

Graduates educational qualification Master in Informatics receive:

• in-depth knowledge of the basic models and systems and implementation of software and information technology;

• ability to implement information products and information systems in different areas of the business and evaluate systems and to develop models to assess the financial risk in the financial markets, insurance and more.

• ability to develop and implement software applications;

• solid theoretical knowledge in the field of informatics and mathematics, and solid practical skills that meet the latest European standards.

• formation of affinity and capacity for independent research and design activities .

• basis for continuing education in the educational and scientific degree "Doctor" .

• good opportunities for such specialists in the country and abroad.

• mindset and affinity (openness) to the rapidly changing requirements of the information society .

III. Requirements for the preparation of graduates

Upon graduating student will be able to realize and take positions that require:

• show a thorough knowledge of the basic models and systems and implementation of software and information technology;

• to implement information products and information systems in different areas of the business;

• evaluate systems and developing models for assessing financial risk in financial markets, insurance and more.

• to develop and implement software applications.

Qualification characteristics of the "Informatics" in degree "Master" with professional qualification of "Master in Informatics" is the basic document that defines the development of curricula and syllabuses . It is consistent with the regulations in the field of higher education in Bulgaria.

First year			
First semester	ECTS credits	Second semester	ECTS credits
Compulsory courses		***Compulsory courses***	
Introduction in financial mathematics	4,5	Time Series and Forecasting	4,5
Econometrics	4,5	Financial Management	3,5
Scientific programing	7	Finance	3
Optional course 1	7	Optional course 3	2
Optional course 2	7	Optional course 4	2
		Preparation for a written state exam or thesis defense	15
Optional courses			
Group 1:		***Optional courses***	
Programing in R language		Group 3:	
Statistical Analysis		Stock markets	
Group 2:		International finance	
Financial analysis		Group 4:	
Operations Research		Theory of Money	
Insurance		Game Theory for Economists	
		Analysis of Financial Risk	
	Total 30		Total 30

COURSE DESCRIPTION

Course Title: Scientific programing
Semester: 1 semester
Course Type: lectures
Hours per Week/FS/SS: 2 lecture and 3 lab hours per week hours per week/FS
ECTS Credits: 7 credits
Course Status: Optional Course in the Bisnesinformatics and Econometrics M.S. Curriculum

Course Description: The proposed course will address some basic methods for designing and solving scientific problems. The main objectives of the course is to equip students with practical skills and knowledge to work with specialized software programs and search for information in academic libraries. The course will demonstrate the approach to the mathematical modeling of real problems and ways of solving them. The models will be tested in practice.

Course Objectives:
Upon completing the course, the student should be able to:

- Describe the basic theoretical aspects of molecular modeling techniques
- Evaluate the successes and limitations of molecular modeling
- Analyze the results of molecular modeling calculations
- Evaluate and discuss current literature related to molecular modeling

Teaching Methods: lectures
Requirements/Prerequisites: Computer skills,

Assessment: written final exam on two theoretical topics (grade weight is 60 %); two projects (grade weight is 40 %).

Registration for the Course: by request at the end of the previous academic year
Registration for the Exam: coordinated with lecturer and Student Service Department

References:
1. Basak S., Grunwald G., Niemi G., Use of Graph-Theoretic and Geometric Molecular Descriptors in Structure-Activity Relationships, in From Chemical Topology toThree-Dimensional Geometry, edited by Balaban A., Plenum Press N.Y., 1997
2. Baxter M.J., Beardah C.C.,Beyond the histogram − improved approaches to simple data display in archaeology using kernel density estimates, Department of Mathematics, Statistics and Operationa lResearch, The Nottingham Trent University, http://science.ntu.ac.uk/msor/ccb/romenew.ps
3. Baxter M.J., Beardah C.C.,MATLAB Routines for Kernel Density Estimation and the Graphical Representation of Archaeological Data Department of Mathematics, Statistics and Operational Research, The Nottingham Trent University, 2010, http://science.ntu.ac.uk/msor/ccb/caarev.ps
4. Boething R.S., Mackay D. (editors), Handbook of Property Estimation Methods for Chemicals. Environmental and Health Sciences, Lews Publishers, 2000
5. Bohacek R.S., McMartin C., Multiple Highly Diverse Structures Complementary to Enzyme Binding Sites: Results of Extensive Application of a de Novo Design Method Incorporating Combinatorial Growth

Abbreviation:
FS: Fall Semester
SS: Spring Semester

COURSE DESCRIPTION

Course Title: Statistical Analysis
Semester: 1 semester
Course Type: lectures and tutorials
Hours per Week/FS/SS: 3 lecture hours and 2 lab hour per week/FS
ECTS Credits: 4 credits
Course Status: Optional Course in the Bisnesinformatics and Econometrics M.S. Curriculum

Course Description: The proposed course will address some basic methods for statistical data analysis. The main objectives of the course are for students to acquire theoretical and practical skills and knowledge to work with specialized software for statistical analysis. The course will demonstrate the approach to the mathematical modeling of real problems and ways of solving them. The models will be tested in practice.

Course Objectives: Parametric and nonparametric methods in research for graduate students majoring in natural sciences or social sciences. The topics are selected from, but not restricted to, contingency tables and chi-squared tests, correlation, simple linear regression and multiple regression, design and analysis of variance, logistic regression, and introduction to multivariate statistics. A major statistical package is used as a tool to aid calculations for many of the techniques.

Teaching Methods: lectures and tutorials
Requirements/Prerequisites: Computer skills, Algebra

Assessment: written final exam on two theoretical topics (grade weight is 60 %); two projects (grade weight is 40 %).

Registration for the Course: by request at the end of the previous academic year
Registration for the Exam: coordinated with lecturer and Student Service Department

References:
1. Statistical Design and Analysis of Experiments, Robert L. Mason, 2003
2. An Introduction to Statistical Methods and Data Analysis, Belmont, 1997
3. Norman Matloff. The Art of R Programming, 2011

Abbreviation:
FS: Fall Semester
SS: Spring Semester

COURSE DESCRIPTION

Course Title: Operations Research
Semester: 1 semester
Course Type: lectures and tutorials
Hours per Week/FS/SS: 3 lecture hours and 2 lab hours per week/FS
ECTS Credits: 7 credits
Department: Informatics, telephone: 073 / 588 532
Course Status: Optional Course in the Business Informatics and Econometrics M.S. Curriculum, period of study 2 semesters

Course Description: The course in Operations Research includes the following main topics: basic concepts in Operations Research; deterministic models, models with uncertainty and stochastic

models, especially the facility location (production planning) problem in deterministic and stochastic version; stochastic programming and stochastic quasigradient methods; dynamic programming and Bellman's principle of optimality; the concept of algorithm, algorithmic (computational) complexity and NP-hard problems; discrete (including integer) optimization problems and network optimization; scheduling theory; queueing theory; game models, matrix game theory and the relationship between matrix game theory and linear programming; decision making theory; fuzzy sets and their application to decision making and management; multi-objective (vector) optimization and Pareto optimality; Markov processes (discrete and continuous); the concept of Monte-Carlo methods and their applications. Software for solving some of the problems under consideration will also be demonstrated.

Course Objectives: Students should obtain knowledge about basic results and methods for studying various real objects, events, phenomena, etc. by using mathematical methods and computes.

Teaching Methods: lectures and tutorials
Requirements/Prerequisites: Numerical Analysis, Mathematical Optimization

Assessment: written final exam on two theoretical topics (grade weight is 60 %); two projects (grade weight is 40 %).

Registration for the Course: by request at the end of the previous academic year
Registration for the Exam: coordinated with lecturer and Student Service Department

References:

Basic Titles:
1. E. S. Vencel – „Operations Research: Problems, Principles, Methodology", 3-rd ed., Knorus, Moscow, 2014 (in Russian).
2. Yu. P. Zaichenko – "Operations Research", Slovo, Kiev, 2003 (in Russian).
3. S. M. Stefanov – "Quantitative Methods of Management", 2003 (in Bulgarian).

Additional Titles:
4. Hamdy A. Taha – „Operations Research. An Introduction", 10-th ed., Pearson, USA, 2017.
5. S. M. Stefanov – "Separable Programming. Theory and Methods", 4-th ed., Springer, Dordrecht–Boston–London, 2016.

Abbreviation:
FS: Fall Semester
SS: Spring Semester

COURSE DESCRIPTION

Course Title: Introduction in financial mathematics
Semester: 1 semester
Course Type: lectures and tutorials
Hours per Week/FS/SS: 3 lecture hours and 1 lab hour per week/FS
ECTS Credits: 4,5credits
Course Status: Optional Course in the Bisnesinformatics and Econometrics M.S. Curriculum

Course Description: This course puts forward key mathematical and statistical topics to help students understand economics at a deeper level. After completing this course, students will have a basic level of understanding of the goals, assumptions, benefits and negatives of probability modeling. This understanding will be invaluable when approaching new statistical topics and will provide students with a framework and foundation for future self learning.

Course Objectives: Students should obtain knowledge about basic results and methods for studying various real objects, events, phenomena, etc. by using mathematical methods and computes.

Teaching Methods: lectures and tutorials
Requirements/Prerequisites: Numerical Analysis, Mathematical Optimization

Assessment: written final exam on two theoretical topics (grade weight is 60 %); two projects (grade weight is 40 %).

Registration for the Course: by request at the end of the previous academic year
Registration for the Exam: coordinated with lecturer and Student Service Department

References:
1. Clarence H. Richardson. Financial Mathematics, Lightning Source Incorporated, 2008
2. Salih N. Neftci. An Introduction to the Mathematics of Financial Derivatives, Academic Press, 2000
3. Manuel Laguna, Johan Marklund. Business Process Modeling, Simulation and Design, Second Edition, Chapman and Hall/CRC 2013

Abbreviation:
FS: Fall Semester
SS: Spring Semester

COURSE DESCRIPTION

Course Title: Econometrics
Semester: 1 semester
Course Type: lectures and tutorials
Hours per Week/FS/SS: 3 lecture hours and 1 lab hour per week/FS
ECTS Credits: 4,5credits
Course Status: Optional Course in the Bisnesinformatics and Econometrics M.S. Curriculum

Course Description: Learn mathematical, programming and statistical tools used in the real world analysis and modeling of financial data. Apply these tools to model asset returns, measure risk, and construct optimized portfolios using the open source R programming language and Microsoft Excel. Learn how to build probability models for asset returns, to apply statistical techniques to evaluate if asset returns are normally distributed, to use Monte Carlo simulation and bootstrapping techniques to evaluate statistical models, and to use optimization methods to construct efficient portfolios.

Topics covered include:

- Computing asset returns

- Univariate random variables and distributions
  - Characteristics of distributions, the normal distribution, linear function of random variables, quantiles of a distribution, Value-at-Risk
- Bivariate distributions
  - Covariance, correlation, autocorrelation, linear combinations of random variables
- Time Series concepts
  - Covariance stationarity, autocorrelations, MA(1) and AR(1) models
- Matrix algebra
- Descriptive statistics
  - histograms, sample means, variances, covariances and autocorrelations

- The constant expected return model
    - Monte Carlo simulation, standard errors of estimates, confidence intervals, bootstrapping standard errors and confidence intervals, hypothesis testing , Maximum likelihood estimation, review of unconstrained optimization methods

Course Objectives: Students should obtain knowledge about basic results and methods for studying various real objects, events, phenomena, etc. by using mathematical methods and computes.

Teaching Methods: lectures and tutorials
Requirements/Prerequisites: Linear algebra, Numerical Analysis, Mathematical Optimization

Assessment: written final exam on two theoretical topics (grade weight is 60 %); two projects (grade weight is 40 %).

Registration for the Course: by request at the end of the previous academic year

References:

1. Eric Goh Ming Hui. Learn R for Applied Statistics: With Data Visualizations, Regressions, and Statistics, 1st edition, 2019, Apress, New York.
2. Numerical Methods in Finance and Economics A MATLAB Based Introduction Second Edition Statistics in Practice, John Wiley & Sons, 2009
3. Applied Statistics Using SPSS, STATISTICA, MATLAB and R, Springer, 2008
4. Хаджиев, В., Статистически и иконометричен софтуер, Варна, Унив. изд. ИУ, 2002, 112 с.
5. Knuth D.E. Postscript about NP-hard Problems, SIGACT News, 1974.
6. Reingold E.M., Neivergelt J., Deo N. Combinatorial algorithms (Theory and Practice), 1980.
7. М. Константинов. Въведение в Matlab. Софт Прес 2008.
8. Introduction in MATLAB. www.mathworks.com, 2011

Abbreviation:
FS: Fall Semester
SS: Spring Semester

COURSE DESCRIPTION

Course Title: Time Series and Forecasting
Semester: 2 semester
Course Type: lectures and tutorials
Hours per Week/FS/SS: 3 lecture hours and 1 lab hour per week/S
S
ECTS Credits: 4.5credits
Course Status: Optional Course in the Bisnesinformatics and Econometrics M.S. Curriculum

Course Description: Course Time Series and Forecasting refers to the use of sophisticated tools both to understand the massive amounts of data most business have available, and to put it to use in forecasting and in making better business decisions. Our group includes experts in advanced analytics, operations management, management science and business statistics. The discipline has research strengths in the areas of financial time series and quantitative risk management; business and economic forecasting; econometrics and Bayesian statistics; computationally intensive estimation; supply chain management and scheduling theory.

Course Objectives: Students should obtain knowledge about basic methods and models for time series analysis.

Teaching Methods: lectures and tutorials
Requirements/Prerequisites: Mathematical finance
Assessment: written final exam on two theoretical topics (grade weight is 60 %); two projects (grade weight is 40 %).
Registration for the Course: by request at the end of the previous academic year

Registration for the Exam: coordinated with lecturer and Student Service Department

References:

1. Bovas Abraham. Johannes ledolter. Statistical Methods for Forecasting, A JOHN WILEY & SONS, INC., PUBLICA'TIONp 2010
2. Introduction to Time Series Analysis http://gauss.stat.su.se/gu/e/ slidesTim e%20Series/Introduction%20to%20Time%20Series% 20Analysis.pdf, 2012
3. H.Scott Bierman and Luis Fernandez, Game theory with Economic Applications, Addison-Wesley Publishing Company, USA, 1998.
4. Norman Matloff. The Art of R Programming, 2011
5. Jim Albert. Bayesian Computation with R, Springer, 2009.
6. Phil Spector. Data Manipulation with R, 2008.

Abbreviation:

FS: Fall Semester
SS: Spring Semester

COURSE DESCRIPTION

Course Title: Financial Management
Semester: 2 semester
Course Type: lectures and tutorials
Hours per Week/FS/SS: 3 lecture hours and 1 lab hour per week/SS
ECTS Credits: 4.5credits

Course Status: Optional Course in the Bisnesinformatics and Econometrics M.S. Curriculum

Course Description: This course will improve your fluency in financial accounting, the language of business. You will learn how to read, understand, and analyze most of the information provided by companies in their financial statements. These skills will help you make more informed decisions using financial information.The course is designed to provide an understanding of financial accounting fundamentals for prospective users of corporate financial information, such as investors, creditors, employees, and other stakeholders (e.g., suppliers, customers). The course focuses on understanding how economic events such as operating activities, corporate investments, and financing transactions are recorded in the three main financial statements (i.e., the income statement, balance sheet, and statement of cash flows). Students will develop the technical skills needed to analyze financial statements and disclosures for use in financial analysis. Students will also learn how accounting standards and managerial incentives affect the financial reporting process.

Course Objectives: Students should obtain knowledge about efficient and effective management of money (funds) in such a manner as to accomplish the objectives of the organization. It includes how to rise the capital, how to allocate it i.e. capital budgeting.

Teaching Methods: lectures and tutorials

Requirements/Prerequisites: Finance

Assessment: written final exam on two theoretical topics (grade weight is 60 %); two projects (grade weight is 40 %).
Registration for the Course: by request at the end of the previous academic year

Registration for the Exam: coordinated with lecturer and Student Service Department

References:

1.1. Eric Goh Ming Hui. Learn R for Applied Statistics: With Data Visualizations, Regressions, and Statistics, 1st edition, 2019, Apress, New York.
2. Rose. P.S., Money and Capital Markets, Boston, 1989.
3. Brigham E., Gapenski L., Daves P., Intermediate Financial Management, Sixth Edition,

US, Florida, Orlando, The Dryden Press,1999

4. Ross S., Westerfield R., Jaffe J., Jordan B., Modern Financial Management, Eighth Edition, Gatton college of business and economics, University of Kentucky, 2008

Abbreviation:

FS: Fall Semester
SS: Spring Semester

COURSE DESCRIPTION

Course Title: Finance
Semester: 2 semester
Course Type: lectures and tutorials
Hours per Week/FS/SS: 3 lecture hours and 1 lab hour per week/SS
ECTS Credits: 3.0 credits

Course Status: Optional Course in the Bisnesinformatics and Econometrics M.S. Curriculum

Course Description: Financial institutions are a pillar of civilized society, supporting people in their productive ventures and managing the economic risks they take on. The workings of these institutions are important to comprehend if we are to predict their actions today and their evolution in the coming information age. The course strives to offer understanding of the theory of finance and its relation to the history, strengths and imperfections of such institutions as banking, insurance, securities, futures, and other derivatives markets, and the future of these institutions over the next century.
This course is primarily devoted to the fundamental principles of valuation. We will learn and apply the concepts of time value of money and risk to understand the major determinants of value creation. We will use both theory and real world examples to demonstrate how to value any asset.
Course Objectives: Students should obtain knowledge about efficient and effective management of money (funds) in such a manner as to accomplish the objectives of the organization. It includes how to rise the capital, how to allocate it i.e. capital budgeting.

Teaching Methods: lectures and tutorials
Requirements/Prerequisites: Finance
Assessment: written final exam on two theoretical topics (grade weight is 60 %); two projects (grade weight is 40 %).
Registration for the Course: by request at the end of the previous academic year
Registration for the Exam: coordinated with lecturer and Student Service Department

References:

1. R.A. Musgrave, P.B. Musgrave, L. Kullmer “Public Finance in Theory and Practice” McGraw- Hill, Inc 1973
2. H. Rosen “Public Finance” Irwin McGraw- Hill 1998.
3. Anthony B. Atkinson and Joseph E. Stiglitz (1980). Lectures in Public Economics, McGraw-Hill Economics Handbook Series
4. Alan S. Blinder, Robert M. Solow, et al. (1974). The Economics of Public Finance, Brookings Institution. Table of Contents.
5. James M. Buchanan, ([1967] 1987). Public Finance in Democratic Process: Fiscal Institutions and Individual Choice, UNC Press. Description, scrollable preview, back cover, and chapter links via Econlib.

Abbreviation:

FS: Fall Semester
SS: Spring Semester

COURSE DESCRIPTION

Course Title: Financial analysis
Semester: 1 semester
Course Type: lectures and tutorials
Hours per Week/FS/SS: 3 lecture hours and 1 lab hour per week/FS
ECTS Credits: 5.0 credits

Course Status: Optional Course in the Bisnesinformatics and Econometrics M.S. Curriculum

Course Description: The lectures on "Financial Analysis" are been developed in accordance with the general objectives of the training in "Biznesinformatika and Econometrics." In structural terms, covering both basic issues common to analysis of financial condition and financial management of different legally registered commercial companies, as well as specific issues related to the determination of liquidity, solvency and profitability of the company, the possibilities of using the operational and financial leverage and application of methods for evaluating the effectiveness of investment projects.
Course Objectives: Students should obtain knowledge for the following elements of a firm: Profitability, Solvency, Liquidity, Stability.
Teaching Methods: lectures and tutorials
Requirements/Prerequisites: Finance
Assessment: written final exam on two theoretical topics (grade weight is 60 %); two projects (grade weight is 40 %).
Registration for the Course: by request at the end of the previous academic year
Registration for the Exam: coordinated with lecturer and Student Service Department

References:
1. Haim Levy, Marshall Sarnat, Capital Investment and Financial Decisions, Grada Publishing, Prague, 1999
2. Ross S., Westerfield R., Jaffe J., Jordan B., Modern Financial Management, Eighth Edition, Gatton college of business and economics, University of Kentucky, 2008
3. Kieso, D. E., Weygandt, J. J., & Warfield, T. D. (2007). Intermediate Accounting (12th ed.). Hoboken, NJ: John Wiley & Sons, p. 1320 ISBN 0-471-74955-9.
4. Ehrhardt, M., Brigham, E. (2008). Corporate Finance: A Focused Approach (3rd ed.). p. 131 ISBN 978-0-324-65568-1.

Abbreviation:

FS: Fall Semester
SS: Spring Semester

COURSE DESCRIPTION

Course Title: Insurance
Semester: 1 semester
Course Type: lectures and tutorials
Hours per Week/FS/SS: 2 lecture hours /FS
ECTS Credits: 7

Course Status: Optional Course in the Bisnesinformatics and Econometrics M.S. Curriculum

Course Description: Teaching in the Discipline of Insurance is informed by the four key areas in which risk is manifest, namely the risk of loss or damage to property; injury, loss or death to people; illness; and living too long. These risks drive the short-term insurance, life insurance, medical insurance, and retirement funding markets. Conceptually these areas are underpinned by the economic theory of risk and insurance, to which a substantial portion of the third year course is devoted.
The course "Insurance" aims to familiarize students with the content and importance of insurance relations as a specific type of economic and financial relations with the activities through which they are carried out and the impact of the state on the the strengthening and development. With the types protection insurance and practices enabling the learners course to be oriented and aware of the main

points related to the implementation of the insurance activity with emphasis on its practical dimensions represented by the specific insurance products.
Course Objectives: Students should obtain knowledge about the Insurance. Insurance involves pooling funds from many insured entities (known as exposures) to pay for the losses that some may incur. The insured entities are therefore protected from risk for a fee, with the fee being dependent upon the frequency and severity of the event occurring. In order to be an insurable risk, the risk insured against must meet certain characteristics. Insurance as a financial intermediary is a commercial enterprise and a major part of the financial services industry, but individual entities can also self-insure through saving money for possible future.
Teaching Methods: lectures and tutorials
Requirements/Prerequisites: Finance
Assessment: written final exam on two theoretical topics (grade weight is 60 %); two projects (grade weight is 40 %).
Registration for the Course: by request at the end of the previous academic year
Registration for the Exam: coordinated with lecturer and Student Service Department

References:
1. Haurant S. (2005). FSA takes on insurance regulation. The Guardian.
2. Franklin, J., 2001, The Science of Conjecture: Evidence and Probability Before Pascal, Baltimore: Johns Hopkins University Press, 259.
3. Gollier C. (2003). To Insure or Not to Insure?: An Insurance Puzzle. The Geneva Papers on Risk and Insurance Theory;).
4. Margaret E. Lynch, Editor, "Health Insurance Terminology", Health Insurance Association of America, 1992, ISBN 1-879143-13-5.

Abbreviation:

FS: Fall Semester
SS: Spring Semester

COURSE DESCRIPTION

Course Title: Stock markets
Semester: 2 semester
Course Type: lectures and tutorials
Hours per Week/FS/SS: 3 lecture hours and 1 lab hour per week/SS
ECTS Credits: 2.0 credits

Course Status: Optional Course in the Bisnesinformatics and Econometrics M.S. Curriculum

Course Description: The classical economic theory of markets cannot account for some important issues, such as the coexistence of unemployment and vacancies; credit market rationing; or bubbles and crashes in asset prices. This course will explore markets with frictions, shedding light on these issues and other fundamental questions such as: What is a bank, why do we use money.
Financial institutions are a pillar of civilized society, supporting people in their productive ventures and managing the economic risks they take on. The workings of these institutions are important to comprehend if we are to predict their actions today and their evolution in the coming information age. The course strives to offer understanding of the theory of finance and its relation to the history, strengths and imperfections of such institutions as banking, insurance, securities, futures, and other derivatives markets, and the future of these institutions over the next century.

Course Objectives: Students should obtain knowledge about stock markets. Market participants include individual retail investors, institutional investors such as mutual funds, banks, insurance companies and hedge funds, and also publicly traded corporations trading in their own shares. Some studies have suggested that institutional investors and corporations trading in their own shares generally receive higher risk-adjusted returns than retail investors.
Teaching Methods: lectures and tutorials
Requirements/Prerequisites: Finance
Assessment: written final exam on two theoretical topics (grade weight is 60 %); two projects (grade weight is 40 %).
Registration for the Course: by request at the end of the previous academic year

Registration for the Exam: coordinated with lecturer and Student Service Department

References:

1. "World Equity Market Declines: -$25.9 Trillion". Seeking Alpha. Retrieved 2011-05-31.
2. Quarterly Review Statistical Annex – December 2008". Bis.org. September 7, 2008. Retrieved March 5, 2010.
3. Cesari, Amedeo De; Espenlaub, Susanne; Khurshed, Arif; Simkovic, Michael (2010). "The Effects of Ownership and Stock Liquidity on the Timing of Repurchase Transactions". Paolo Baffi Centre Research Paper No. 2011-100. SSRN 1884171.
4. Simkovic, Michael (2009). "The Effect of Enhanced Disclosure on Open Market Stock Repurchases". Berkeley Business Law Journal 6 (1). SSRN 1117303

Abbreviation:

FS: Fall Semester
SS: Spring Semester

COURSE DESCRIPTION

Course Title: International finance
Semester: 2 semester
Course Type: lectures and tutorials
Hours per Week/FS/SS: 2 lecture hours/SS
ECTS Credits: 2.0 credits

Course Status: Optional Course in the Bisnesinformatics and Econometrics M.S. Curriculum

Course Description: This course will discuss various aspects of the internationalization, including the reform of the international monetary system, the opportunities and challenges to internationalize, the evolution of monetary and exchange rate policies, and the implications .
This course will discuss various aspects of internationalization. Specifically, innovative suggestions will be provided on topics including the reform of the international monetary system, the opportunities and challenges of the internationalization, and the evolution of monetary and exchange rate policies. Since the internationalization is important to the future of an international financial center, the lectures will also discuss the possible implications of this process.

Course Objectives: This course provides the student the knowledge and skills needed to manage the complexities of financing exports, imports, and direct foreign investment. Primary topics include the nature or behavior of foreign exchange rates and managing the impacts of exchange rates on short-term and long-term international business activities and performance objectives. This course can be adapted for graduate or undergraduate levels.

Teaching Methods: lectures and tutorials
Requirements/Prerequisites: Finance
Assessment: written final exam on two theoretical topics (grade weight is 60 %); two projects (grade weight is 40 %).
Registration for the Course: by request at the end of the previous academic year
Registration for the Exam: coordinated with lecturer and Student Service Department

References:

1. Brigham E.F., Houston J.F., (2001), “Fundamentals of Financial Management”, Harcourt College Publishers, 959 p.;
2.Mishkin F. S., (1992), “The Economics of Banking and Financial markets”, Harper Collins pbl.;
3.Madura J., (2010), Financial Institutions and Markets, South-Western College Publishing;
4.Douglas L. G., (1990), Bonds Risk Analysis, New York Institute of Finance;
5.Hyman D., (1988), Economics, IRWIN;
6.Gandolfo G., (1987), International Monetary Theory and Open Economy Macroeconomics, Springer Verlag;

7. Banking Sector Development in Central and Eastern Europe, (1996), Institute for EastWest Studies;
8. Buckle M., Thompson J., (1999), The UK Financial System: Theory and Practice, Manchester University Press;
9. Block S., Hirt G., (1984), Foundations of Financial Management, RICHARD D. IRWING, INC.;
10. Ganchev G., (2000), Macroeconomic Problems (The Currency Board Arrangement; Maastricht Criteria; Macroeconic Policy), in Monitoring of Bulgaria's Accession to the European Union, Friedrich Ebert Stiftung, Sofia;

Abbreviation:

FS: Fall Semester
SS: Spring Semester

COURSE DESCRIPTION

Course Title: Theory of Money
Semester: 2 semester
Course Type: lectures and tutorials
Hours per Week/FS/SS: 2 lecture hours/SS
ECTS Credits: 2.0 credits

Course Status: Optional Course in the Bisnesinformatics and Econometrics M.S. Curriculum

Course Description: The last three or four decades have seen a remarkable evolution in the institutions that comprise the modern monetary system. The financial crisis of 2007-2009 is a wakeup call that we need a similar evolution in the analytical apparatus and theories that we use to understand that system. This course is an attempt to begin the process of new economic thinking by reviving and updating some forgotten traditions in monetary thought that have become newly relevant. Three features of the new system are central:
Most important, the intertwining of previously separate capital markets and money markets has produced a system with new dynamics as well as new vulnerabilities. The financial crisis revealed those vulnerabilities for all to see.
Second, the global character of the crisis has revealed the global character of the system, which is something new in postwar history but not at all new from a longer time perspective. Central bank cooperation was key to stemming the collapse, and the details of that cooperation hint at the outlines of an emerging new international monetary order.
Third, absolutely central to the crisis was the operation of key derivative contracts, most importantly credit default swaps and foreign exchange swaps. Modern money cannot be understood separately from modern finance, nor can modern monetary theory be constructed separately from modern financial theory. That's the reason this course places dealers, in both capital markets and money markets, at the very center of the picture, as profit-seeking suppliers of market liquidity to the new system of market-based credit.
Course Objectives: Students should obtain knowledge about the monetary economics.
Teaching Methods: lectures and tutorials
Requirements/Prerequisites: Finance
Assessment: written final exam on two theoretical topics (grade weight is 60 %); two projects (grade weight is 40 %).
Registration for the Course: by request at the end of the previous academic year
Registration for the Exam: coordinated with lecturer and Student Service Department

References:

1. Madura J., Financial Markets and Institutions, South-Western College Publishing, 2001.
2. Douglas L. G., Bonds Risk Analysis, New York Institute of Finance, 1990.
3. Hyman D., Economics, IRWIN, 1988.
4. Gandolfo G., International Monetary Theory and Open Economy Macroeconomics, Springer Verlag, 1987
5. Banking Sector Development in Central and Eastern Europe, Institute for East West Studies, 1996
6. Buckle M., Thompson J., The UK Financial System: Theory and Practice, Manchester University Press, 1999
7. Block S., Hirt G., Foundations of Financial Management, RICHARD D. IRWING, INC., 1984

8. Ganchev G., Macroeconomic Problems (The Currency Board Arrangement; Maastricht Criteria; Macroeconic Policy), in Monitoring of Bulgaria's Accession to the European Union, Friedrich Ebert Stiftung, Sofia 2000

Abbreviation:

FS: Fall Semester
SS: Spring Semester

COURSE DESCRIPTION

Course Title: Game Theory for Economists
Semester: 2 semester
Course Type: lectures and tutorials
Hours per Week/FS/SS: 2 lecture hours/SS
ECTS Credits: 2.0 credits

Course Status: Optional Course in the Bisnesinformatics and Econometrics M.S. Curriculum

Course Description: Game Theory for Economists studies the interactions of decision makers whose decisions affect each other. The analysis is from a rational viewpoint: every participant would like to obtain the outcome that he prefers most. However, each one has to take into account that the others are doing the same trying to get what they prefer most. At times this leads to fierce competition; at other times, to mutually beneficial cooperation; and in general, to an appropriate combination of these two extreme behaviors. Game theory, which may be viewed as a sort of "unified field" theory for the rational side of social science, develops the theoretical foundations for the analysis of such multi-person interactive situations, and then applies these to many disciplines: economics, political science, biology, psychology, computer science, statistics and law. Foremost among these is economic theory, where game theory is playing a central role.
Course Objectives: Students should obtain knowledge about the game theory and representation the game in Extensive form, Normal form and Characteristic function form.
Teaching Methods: lectures and tutorials
Requirements/Prerequisites: Economics and Mathematical models.
Assessment: written final exam on two theoretical topics (grade weight is 60 %); two projects (grade weight is 40 %).
Registration for the Course: by request at the end of the previous academic year
Registration for the Exam: coordinated with lecturer and Student Service Department

References:
1. Introduction to Game Theory, 2012, http://gametheory.net/lectures/level.pl
2. Game Theory, 2013, Massachusetts Institute of Technology, http://gametheory.net/lectures/level.pl
3.Robert Gibbons, Game theory for applied economists, Princeton University Press,1992.
4.J. McMillan , Games, Strategies and Managers, Oxford, 1992.
5.R. Myerson, Game theory:Analysis of conflict, Harvard University Press,1991
6.H.Scott Bierman and Luis Fernandez, Game theory with Economic Applications, Addison-Wesley Publishing Company, USA, 1998.

Abbreviation:

FS: Fall Semester
SS: Spring Semester

COURSE DESCRIPTION

Course Title: Analysis of Financial Risk
Semester: 2 semester
Course Type: lectures and tutorials
Hours per Week/FS/SS: 2 lecture hours/SS

ECTS Credits: 2.0 credits

Course Status: Optional Course in the Bisnesinformatics and Econometrics M.S. Curriculum

Course Description: This course is an introduction to the theory and practice of financial engineering and risk management. We consider the pricing of derivatives, portfolio optimization and risk management and cast a critical eye on how these are used in practice.
Financial Engineering is a multidisciplinary field involving finance and economics, mathematics, statistics, engineering and computational methods. The emphasis of this course will be on the use of simple stochastic models and optimization for portfolio optimization, derivatives pricing and risk management.
Course Objectives: We hope that students who complete the course will have a good understanding of the "rocket science" behind financial engineering. But perhaps more importantly, we hope they will also understand the limitations of this theory in practice and why financial models should always be treated with a healthy degree of skepticism.
Teaching Methods: lectures and tutorials
Requirements/Prerequisites: Economics
Assessment: written final exam on two theoretical topics (grade weight is 60 %); two projects (grade weight is 40 %).

Registration for the Course: by request at the end of the previous academic year
Registration for the Exam: coordinated with lecturer and Student Service Department

References:

1. Eric Goh Ming Hui. Learn R for Applied Statistics: With Data Visualizations, Regressions, and Statistics, 1st edition, 2019, Apress, New York.
2. Z. Bodie and R.C. Merton. Finance. Prentice Hall, 2000.
3. E.V. Boguslavskaya. Exact solution of a problem of the optimal control of investments in a diffusion model. Uspekhi Mat. Nauk, 52(2(314)):157–158, 1997.
4. A.N. Shiryaev. Quickest detection problems in the technical analysis of the financial data. In H. Geman et al., editor, in Mathematical Finance - Bachelier Congress 2000, pages 487–521, New York, 2002. Springer-Verlag.

Abbreviation:

FS: Fall Semester
SS: Spring Semester

COURSE DESCRIPTION

Course Title: Programming with R language
Semester: 1
Course Type: lectures and lab

Hours per Week/FS/SS: 3 lecture and 2 lab hours per week hours per week / FS
ECTS Credits: 4
Course Status: Optional Course in the Bisnesinformatics and Econometrics M.S. Curriculum

Course Description:

The course will demonstrate the ability of some scripting languages in processing data obtained from those obtained from various research activities. The created models will be tested in practice. Examples of scripting languages are: R language

Course Objectives:

The expected results are related and result from the set goal and tasks.

Teaching Methods: lectures and tutorials

Requirements/Prerequisites: Basic knowledge of numerical methods and mathematical optimization is required.

Assessment: written exam on two topics from the Synopsis, drawn at random (the grade is 60%); current control: two course assignments (assessment weighs 40%).

Registration for the Course: it is necessary to submit an application to the academic department at the end of the previous school year.

Registration for the Exam: coordinated with lecturer and Student Service Department

References:

1. Eric Goh Ming Hui. Learn R for Applied Statistics: With Data Visualizations, Regressions, and Statistics, 1st edition, 2019, Apress, New York.
2. Norman Matloff. The Art of R Programming, 2011
3. Jim Albert. Bayesian Computation with R, Springer, 2009.
4. Phil Spector. Data Manipulation with R, 2008.
5. Brian S. Torvitt, Torsten Hothorn. A Handbook of Statistical Analyses 2006. John Maindonald, John Braun.
6. Data Analysis and Graphics Using R: An Example-Based Approach, Cambridge University Press, 2003.

Abbreviation:

FS: Fall Semester
SS: Spring Semester