QUALIFICATION CHARACTERIZATION
OF MAJOR FIELD OF STUDY "ECONOMICAL MATHEMATICS"
FOR "MASTER OF SCIENCE" DEGREE
WITH PROFESSIONAL QUALIFICATION "MASTER OF MATHEMATICS"

The specialty "Economical Mathematics" is from the field of higher education 4. Natural Sciences, Mathematics and Informatics in the professional field 4.5 Mathematics. The training in the specialty for the educational and qualification degree "Master" has a full-time form with a duration of 1 year (2 semesters). Graduates of this specialty acquire the professional qualification "Master of Mathematics".

General characteristics of the program: The students completed this major fild of study have specialized knowledge and skills in modern applications of mathematics and mathematical modeling. By incorporating Informatics disciplines, ensure students' knowledge in the field of information systems in the economy. Part of the courses are optional, which allows students to prepare more thoroughly in their desired field of theory and applications of mathematics, and to attend additional courses in mathematics, informatics, economics, insurance and other. The training ends with a state exam or thesis defense, which will allow them to individually solve relevant to mathematics and its application tasks.

Requirements to preparation of students completing this major field of study

Students completed MSc degree in Economical Mathematics have to possess following knowledge, skills and competences:

- Skills to create a mathematical model of a situation to prove mathematical statements and to solve problems with theoretical or applied nature;
- Ability to abstraction, logical development of formal mathematical theories and establishing links between them;
- Ability for mathematical modeling of real world phenomena and describe through mathematical apparatus of the studied processes and phenomena;
- Ability to deal with new tasks from different areas of knowledge;
- Ability to understand problems and derive the general regularities in them;
- Ability to formulate complex problems of optimization, decision making and to interpret the obtained solutions in terms of the context of the problem to be solved;
- Ability to make mathematical arguments and conclusions from them clear, precise and accurate mathematical language, in oral and written form to those for whom it is intended decision of the mathematical problem;
- Knowledge of the process of learning and teaching of mathematics in different levels of training.

Career opportunities: The students completed this Master's program are prepared to apply mathematical formalism and use new technologies in different application areas - banks, insurance companies, the economy and trade, scientific research teams. Graduates of the Master's program "Economical Mathematics" have the opportunity to continuing education at PhD degree. They can work as teachers and researchers in universities and research institutes.

Admission requirements for the specialty: candidates must hold a Bachelor's or Master's degree in: Professional field 4.5 "Mathematics" or Professional field 1.3 Pedagogy of Education in the specialty "Mathematics and Informatics".

Qualification characterization of Major field of study "Economical Mathematics" for MSc degree is a basic document that determines rules for developing the curriculum. This qualification characterization is conformed to legislation in the area of higher education in Republic of Bulgaria.

CURRICULUM

Field of Study: Economical Mathematics, 2 semesters

First Year			
First Semester	**ECTS credits**	**Second Semester**	**ECTS credits**
Compulsory Courses		***Compulsory Courses***	
Micro and Macroeconomics	7.5	Information science in economics	5.0
Finance	6.0	Stochastic models in economics	5.0
Financial Mathematics	7.5	Optional course	5.0
Mathematical Models in Economics	4.5	Thesis	15.0
Optional course	4.5	***Optional Courses***	
		Game theory	5.0
Optional Courses		Nonlinear dynamics and economics	5.0
Finance and financial operations	4.5	Time series	5.0
Insurance	4.5		
Econometrics	4.5		
Technologies, competition and business strategies in the XXI century	4.5		
	Total 30		**Total 30**

TOTAL FOR 1 ACADEMIC YEAR: 60 CREDITS

COURSES DESCRIPTION

COMPULSORY COURSES

MICRO AND MACROECONOMICS

Semester: 1 semester
Course Type: Lectures and seminars
Hours per week: 3 lecture hours and 2 seminar hours / Fall Semester
ECTS credits: 7.5 credits
Assessment: exam
Department: Economics, Faculty of Economics, SWU "Neofit Rilski" - Blagoevgrad

Course Status: Compulsory course in the M.Sc. Curriculum of Economic Mathematics.

Short Description: The course is designed primarily for the analysis of the main aspects of the theory and practice of democratic market economy type. It clarifies the basic methodological formulations and provides an overview of economic laws, valid for the entire line of business /those having universal significance/. Course contents: Need, purpose, and key aspects of developing and managing projects. Nature and basic characteristics of the financial analysis of projects. Stages and key areas of financial analysis of projects. Basic financial concepts. Time value of money. Compounded and discounted cash flows. Annuities. Criteria and methods of financial analysis and project evaluation. Static methods for financial analysis of projects. Dynamic methods of financial analysis of projects. Choice between alternative projects. Methods for selecting between two or more projects. Essence of the risk in developing and managing projects. Approaches and methods of analysis and risk assessment.

Course Aims: The aim is to justify the idea that the entire business as a direct or indirect connection with the major issues of supply and demand, "strong" and "weak" pulse of the market on "balance" the efficiency and profitability of implementation of specific planning, reporting mandatory conditions ensuring economic development entities in the long term, etc.

Assessment: The discipline ends with an exam. The priority in the training is the practical and independent work of the students. The knowledge, skills and competence are assessed during the seminar classes, during the implementation of the current control, and the results achieved from the assigned tasks and tests are of serious importance. The course of training in the discipline includes the implementation of an incoming current control. Current control builds in students responsibility for the assigned tasks, self-discipline, systematicity in preliminary preparation, builds habits for optimizing time, develops logical thinking, skills for selecting and analyzing information acquired from various information sources.

Current control is carried out through the following methods:

- Discussion, expression of one's own reasoned opinions regarding the topic treated in the seminar classes;
- Verification of the acquired knowledge by solving tests on the taught material;
- Ability to present and successfully defend one's own ideas and solutions.

Registration for the exam: coordinated with the lecturer and student Service Department

References:

Basic Titles

1. Е. Бояджиева, М. Кьоглер. Основи на икономическата теория. Благоевград 2005.
2. Л. Йотова. Икономикс. Част I и II. Изд. УНСС, София 2008.
3. И. Димов. Обща икономическа теория. Изд. "Абагар". В. Търново 2004.
4. Г. Хартман. Пазарна икономика. Част I и II. Изд. "Булвест-2000", София 2003.
5. Е. Сотирова. Сборник от задачи тестове по макроикономика. УНСС, София 2003.
6. Проф. Стоядин Савов "Икономикс", С. 1996 г. – в два тома.
7. Проф. Камен Миркович, "Икономикс", С. 2001 г.
8. Пламен Пъчев – „Микроикономика" С.-Бл. 2011 г.

Additional Titles

1. Дж. М. Кейнс. Обща теория на заетостта, лихвата и парите. Изд. "Хр. Ботев", София 1994.
2. М. Фридмън. Немирството на парите. Епизоди от монетарната история. ИК "Дамян Яков", София 1994.
3. Р. Рийч. Трудът на нациите. Как да се подготвим за капитализма на XXI век. Унив. изд. "Св. Климент Охридски", София 1992.
4. Р. Хайлбронер, Л. Търоу. Икономика за всички. Изд. "Интерпринт", София 1993.
5. Учебен речник по икономикс. Том I и II. Изд. "Сиела", София 2003.
6. Проф. Поль Самуэлсон "Экономика", М. 1976 г. /Препоръчително е да се ползват учебниците на този автор – самостоятелно или в съавторство с Нордхаус на съответните западни езици, които студентът владее/
7. Проф. Гернот Хартман "Пазарна икономика", С. 1992 г. – в две части

FINANCE

Semester: 1 semester
Course Type: Lectures and seminars
Hours per week: 3 lecture hours and 1 seminar hour /Fall Semester
ECTS credits: 6.0 credits
Assessment: exam
Department: Finance and accounting, Faculty of Economics, SWU "Neofit Rilski" - Blagoevgrad

Course Status: Compulsory course in the M.Sc. Curriculum of Economic Mathematics.

Short Description: The course is aimed to transmit to the students the basic knowledge about the state fiscal and budget policy. The material includes a reasonable compromise between theoretical and practical information. The course is aimed at letting the students: (i) to consider the particularities of the state finance system; (ii) to acquire new basic knowledge and skills for organizing and managing of the public finances; (iii) to be aware of the methods for planning and regulating in the state fiscal and budget sphere, as well as of the applicable organization structures in this regard; (iv) to apply the existing techniques for generation of innovative and creative ideas in the tax policy; (v) to be able to identify, evaluate and avert and limit the risk that accompany the management of the public finances.

Course Aims: The goals and objectives of the course are for students to acquire knowledge about the basic rules of financing and investing, valid for the corporate sector, and skills for independent application of theoretical material in practice. Teaching methods: Lectures, seminars

Assessment: The course ends with an exam. The priority in training is the practical and independent work of students. Knowledge, skills and competence are assessed during the seminars, during the implementation of the current control, and the results achieved by the assigned tasks and tests are of great importance. The current control builds in students responsibility for the assigned tasks, self-discipline, systematicity in preliminary preparation, builds habits for optimizing time, develops logical thinking, skills for selecting and analyzing information acquired from various information sources.

Current control is carried out through the following methods:

- Discussion, expression of one's own reasoned opinions regarding the topic treated in the seminar classes;
- Presentation and defense of the theses set out in the assigned written work;
- Verification of the acquired knowledge by solving tests on the taught material;
- Ability to present and successfully defend one's own ideas.

Registration for the exam: coordinated with the lecturer and student Service Department

References:

Basic Titles

1. Ч. Николов Д. Стоилова Е. Ставрова "Публични финанси" БОН Благоевград 2010
2. Стоянов, В., Финанси, ИК Галик, София, 2008

Additional Titles

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

FINANCIAL MATHEMATICS

Semester: 1 semester
Course Type: lectures and seminars
Hours per Week: 3 lecture hours and 2 seminars hour / Fall Semester
ECTS Credits: 7.5 credits
Assessment: exam
Department: Mathematics and Physics, Faculty of Natural Sciences and Mathematics, SWU "Neofit Rilski" – Blagoevgrad
Course Status: Compulsory course in M.Sc. Curriculum of Economic Mathematics.

Course Description:

The subject includes the study of basic concepts of financial mathematics, financial calculations which are used in the process of banking practice. Students are also introduced to the basics of statistical databases and obtain information about patterns and trends that may occur, their utility in the evaluation and decision-making in certain activities in the bank sector.

Purposefully, emphasis is put on the instrumentation and the application of statistical methods that emerge in different banks, namely: addition, organization and presentation of statistical data, presentation of statistics, descriptive statistics, variance, correlation, indexing, and analysis of time series. Practical application methods related to the use of different quantitative methods in economics are treated – types of interests, calculation features of discount operations and techniques of discounted cash flows, preparation of repayment plans and methods that calculate the profitability of financial instruments .

Course Aims:
The Financial Mathematics discipline aims to offer a thorough and detailed understanding of the concepts, principles, approaches and techniques in the field of financial calculations. Teaching methods: The course is held in lecture halls together with students from both Master's programs in "Economic Mathematics". Exercises are conducted in groups, usually consisting of 25 students.

Requirements/Prerequisites: Students should have knowledge and skills in financial calculations, application of discounting operations and discounting of cash flows, loan repayment plans.

Assessment: Written exam. Students take two tests during the semester. After the end of the semester, a written exam and an interview are held to assign a final grade.

Registration for the Exam: in agreement with the teacher and the academic department.

References:

1. Мейсън, А., Браун, Л., Петров, С., Финансова математика, МБИ, София, 2012, г.
2. Дочев, Д., Николаев, Р., Петков, Й., Финансова математика, Варна, Унив. Издат. Наука и икономика, 2010, ISBN: 978 954 21 0499 5.
3. Цончев, Р., Финансови изчисления, НБУ.
4. Йовков, Й. Петков, В., Финансова математика, „Нова звезда", София, 2001, ISBN: 954 8981 32 7.
5. Van Horn, J., Vachowicz Jr., Fundaments of Financial Menagement, Prentice Hall, Upper Saddle River, New Jersy 07458, 2001.

MATHEMATICAL MODELS IN ECONOMY

Semester: 1 semester
Type of course: lectures /L/ + exercises /E/
Hours (weekly): 2 lecture hours and 1 seminars hour / Fall Semester
ECTS Credits: 4.5 credits
Assessment: exam
Department: Mathematics and Physics, Faculty of Natural Sciences and Mathematics, SWU "Neofit Rilski" – Blagoevgrad

Course Status: Mandatory course in the curriculum of the specialty "Economic Mathematics"

Short Description: The presented course on mathematical models in economics examines models that are often used in macro- and microeconomics. The set of mathematical models that to one degree or another correctly describe economic processes can be united under the name “Mathematical Economics”. This includes models of production activity (the so-called real economy) and financial and credit activity. The course presents the methods of modeling pricing and taxation. From the point of view of mathematics, issues of forecasting and regulation of the economy are considered and analyzed.

Course Objective: The course presented in the program introduces mathematics students to mathematical models of economic phenomena, it provides an opportunity to study the possibilities of applying these models and methods in practice.

Teaching methods: lectures and seminars

Assessment: exam

Registration for the exam: agreed with the teacher and the academic department

References:

Basic Titles:

1. Е. В. Бережная и др. Математические методы моделирования экономических систем. Москва. 2006.
2. В. А. Колемаев. Математисекая экономика. М. Юнити Дана, 2002.
3. С. В. Юдин. Математика в экономике. Тула, РГТЭУ, 2009.
4. Э. Петерс. Хаос и порядок на рынках капитала. Новый аналитический взгляд на циклы, цены и изменчивость рынка. Москва, 2011.
5. Н. Ю. Грызина. Математические методы исследования операций в экономике. Москва, ЕООИ, 2008.
6. О. О. Замков. Математические методы в экономике. Москва, МГУ, 2001.
7. А. С. Солодовников и др. Математика в экономике. В 2-х частях, Москва, 2000.
8. С. А. Минюк. Математические методы и модели в экономике. Москва, Тэтра мал.
9. В. А. Малугин. Математика для экономистов: Линейная алгебра, Москва, МГУ, 2006.
10. В. И. Малыхин. Финансовая математика, Москва, 2003.
11. И. Н. Мастяева и др. Исследование операций в экономике, Москва, 2003.
12. М. Ю. Афанасьев и др. Исследование операций в экономике, Москва, 2003.
13. П. Попиванов, П. Китанов Обикновени диференциални уравнения. Благоевград, 2000.
14. В. Босс. Лекции по математике. Дифференциальные уравнения, Москва, 2004.
15. DifferentialEquations, 2008, http://www.sosmath.com/diffeq/diffeq.html
16. Е. Хорозов. http://debian.fmi.uni-sofia.bg/~horozov/ DifferentialEquations/book.pdf
17. Ordinary Differential Equation http://www.mat.univie.ac.at/~gerald/ftp/book-ode/ode.pdf
18. А. Дорозов, Т. Драгунов. Визуализация и анализ инвериантных множеств динамических систем, Москва, 2003.
19. J. Stewart. Calculus. III ed. (AUBG). 1996.

Additional Titles:

1. В. П. Дьяконов, В. И. Абраменкова, В. Круглов. Matlab 5 с пакетами разширения. Москва, 2001.
2. С. Поршнев. Вычислительная математика. Санкт Петербург, 2004.

3. С. П. Капица, С. Курдюмов, Г.Малинецкий. Синергетика и прогнозы будущего. Москва, 2003.
4. В.-Б. Занг. Синергетическая экономика. Мир, Москва, 1999.
5. Г. Малинецкий, А. Потапов. Современные проблемы нелинейной динамики. Москва, 2002.
6. М. Тасев. Мултимедийни математически курсове и синергетика. В сб.: Качеството на университетското образование – опит, европейски измерения и нови предизвикателства, Благоевград, 2002, стр. 77-90.
7. М. Тасев. В търсене на съюз между синергетиката и образованието през XXI век, сп. Педагогика, кн. 10, 2001., стр. 3-28.
8. П. Бозарова, М. Тасев, Ив. Иванов. Информационните технологии като изход от кризата на университетското образование. В сб. Качеството на университетското образование, Благоевград, 2002, стр. 68-77.

INFORMATION SYSTEMS IN ECONOMICS

Semester: 2 semester
Course type: Lectures and tutorials in computer lab
Hours per Week: 1 lecture hour and 3 lab hour per week / Summer Semester
ECTS Credits: 5.0 credits
Department: Informatics, Faculty of Natural Sciences and Mathematics, SWU "Neofit Rilski" – Blagoevgrad

Course status: Compulsory Course in M.Sc. Curriculum of Economic Mathematics

Course description: The course includes the following sections:

- Information Society;
- Computer Systems – Basics;
- Operating Systems;
- Application Software Systems;
- Application Systems in Business;
- Application Systems in Communications.

In terms of its structure and content, the course coincides with similar courses in a number of reputable universities around the world.

Course aims: The course aims to provide students with knowledge of basic information technologies and systems and their applications in business. Teaching methods: In lectures, the theoretical material is given extensively, supported by numerous examples, which is implemented in different variations during laboratory classes. Exercises are held in the university's computer laboratories.

Teaching methods: lectures, seminars, group discussions or workshop, projects, other methods

Requirements/ Prerequisites: Basic knowledge in Computer science.

Assessment: Written exam. Students are required to successfully complete two tests during the semester. The two test scores constitute 40% of the final semester grade. After the end of the semester, a written exam and an interview are held, after which the final grade is given.

Registration for the exam: in the department office, co-ordinated with the lecturer.

References:

Basic Titles:

1. Пламенка Боровска, Компютърни системи, Сиела, 2009.
2. Ангел Ангелов, Учебна среда за обучение по електронни таблици, София, 2012.
3. Марсел Гание, Преминаване към Linux + CD, СофтПрес, 2010.
4. Windows Vista - в лесни стъпки, СофтПрес, 2010.
5. Венцислав Джамбазов, Уеб базирани потребителски интерфейси, НБУ, 2011.
6. Георги Илиев, Димитър Атамян, Мрежи за данни и интернет комуникации, Нови знания, 2009.
7. Денис Колисниченко, HTML 5 & CSS 3 - практическо програмиране за начинаещи, Асеневци, 2012.
8. Анета Зашева, Информационни системи - Приложение в оперативното управление, София, 2012.

STOCHASTIC MODELS IN ECONOMICS

Semester: 2 semester
Course type: Lectures and tutorials in computer lab
Hours per Week: 2 lecture hours and 2 lab hour per week / Summer Semester
ECTS Credits: 5.0 credits
Department: Informatics, Faculty of Natural Sciences and Mathematics, SWU "Neofit Rilski" – Blagoevgrad

Course status: Compulsory Course in M.Sc. Curriculum of Economic Mathematics

Short Description: The main topics to be considered:

- basic economic tasks that require stochastic modeling;
- construction of stochastic models of real problems of economy and analyzing them;
- practical ability to construct stochastic models and etc.

Course Aims: The aim of the subject is for students to acquire theoretical knowledge and practical experience in building stochastic models in economics. Main tasks:

- Recognize basic stochastic models;
- Work with ready-made models;
- Compile and parameterize simple stochastic models.

Expected results are the development of skills for applying stochastic models to solve economic problems.

Teaching Methods: lectures and seminars

Assessment: The semester exam is in two parts:

Part 1. Test, which includes tasks on the topics from the syllabus.
Part 2. Includes development and defense of a project, and a description of the IT used.

Registration for the exam: coordinated with the lecturer and student Service Department

References:

Basic Titles:
1. Аласдър Смит. Математическо въведение в икономиката. Изд. „Кл. Охридски" 2000
2. Oksendal B., *StochasticDifferentialEquations*, 6th edition, Springer, 2003.
3. Ross S.M., *Introduction to ProbabilityModels*, 10th edition, AcademicPress, 2010.
4. Божкова М., *Случайни процеси*, 2012
Additional Titles:
1. Grimmett G., Stirzaker D., *ProbabilityandRandomProcesses*, 3rd edition, Oxford UniversityPress, 2001.
2. Димитров Б., Янев Н., *Вероятности и статистика*, Университетско издателство "Св. Климент Охридски", 2002.
3. Стоянов Й., *Стохастични процеси – теория и приложение*, Наука и изкуство, 1978

OPTIONAL COURSES

FINANCE AND FINANCIAL OPERATIONS

Semester: 1 semester
Course Type: lectures
Hours per Week: 3 lecture hours per week/Fall Semester
ECTS Credits: 4.5 credits
Department: Finance and Accounting, Faculty of Economics, SWU "Neofit Rilski" - Blagoevgrad

Course Status: Optional course in M.Sc. Curriculum of Economic Mathematics

Course Description: The course "Finance and financial operations" aims to introduce students to the theory of capital markets, as well as the most important institutional fundamentals of stock trading and stock exchange transactions.
The material is selected in accordance with the prescribed workload and specifics of the course and within a reasonable compromise between the theoretical and empirical material gives priority to the relationship between economic theory and actual market behavior of investors, issuers and other market agents. To this end, consider some topics that are not included in the curriculum in securities and financial markets of other economic subjects.
Discipline is one of the main subjects in the training of specialists with higher economic education of all specialties. It specifies a number of theoretical issues related to micro and macroeconomics, while giving practical knowledge necessary for successful work in a competitive market environment

Course Aims: The aim of the course is for students to acquire the necessary theoretical knowledge, allowing for a correct interpretation of the economic behavior of investors, issuers, speculators, stockbrokers and financial supervision authorities. Teaching methods: Lectures are conducted in the classical manner, with students being introduced to the material taught sequentially. Each lecture begins with a brief introduction and a connection to the previous material. During the lectures, questions are asked related to the previous material and questions introducing the new material. The lectures are richly illustrated with graphic materials and the use of multimedia. In the exercises, the material is oriented towards the use of computer programs in solving practical problems.

Assessment: The discipline ends with an exam. The discipline gives priority to the practical and independent work of the students, which is planned to be individual and in working groups. Knowledge, skills and competence are assessed in the preparation of both practical exercises and homework, computer tests and coursework.

Enrollment for training in the discipline: an application is submitted to the Department of Mathematics and Physics.

Registration for the exam: coordinated with the lecturer and student Service Department

References:

Basic Titles:

1. Кругман П. Р., Международен икономикс, УНСС, София 2014
2. Ганчев Г. Т., Финансите като система, Благоевград, 2010
3. Попов Д., Ценни книжа и фондови борси, Сиела, 2001 г., 367 с.
4. Стоянов С., Фючърси, опции и синтетични ценни книжа, Тракия-М, 1999 г., Б
5. Ганчев Г., Ставрова Е., Международни финанси и финансова политика, Благоевград, 2009.

Additional Titles:

1. 50 Years of Money and Finance: Lessons and Challenges, SUERF, 2013
2. Madura J., Financial Markets and Institutions, South-Western College Publishing, 2001
3. Douglas L. G., Bonds Risk Analysis, New York Institute of Finance, 1990
4. Hyman D., Economics, IRWIN, 1988
5. Gandolfo G., International Monetary Theory and Open Economy Macroeconomics, Springer Verlag, 1987
6. Banking Sector Development in Central and Eastern Europe, Institute for EastWest Studies, 1996
7. Buckle M., Thompson J., The UK Financial System: Theory and Practice, Manchester University Press, 1999
8. Block S., Hirt G., Foundations of Financial Management, RICHARD D. IRWING, INC., 1984
9. 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
10. Стоименов, Милчо, Финансиране на международната търговия, София, 1999
11. Христов М., Христов С., Книга за парите, АБАГАР, 2002
12. Йорданов Й., Инвестиционни фондове: Структура, мениджмънт, оценка, Варна 2002.
13. Неновски, Николай, Свободните пари, издателство "Проф. Марин Дринов", БАН, София, 2000 г.

INSURANCE

Semester: 1 semester
Course Type: lectures
Hours per Week: 3 lecture hours per week/Fall Semester
ECTS Credits: 4.5 credits
Department: Finance and Accounting, Faculty of Economics, SWU "Neofit Rilski" - Blagoevgrad

Course Status: Optional course in M.Sc. Curriculum of Economic Mathematics

Course Description: The types of insurance considered enable future financiers and accountants to be oriented and familiar with the main problems of insurance, emphasizing their essential, unchanging features over time. This will be necessary regardless of which side of the insurance contract the graduates will work on - as experts in an insurance company or as experts for its clients.

Course Aims: The aim is for future economists to become familiar with the content and significance of insurance relations as a specific type of economic relations, with the activity through which these relations are implemented, as well as with the impact of the state on their strengthening and development.

Teaching methods: Lectures on the course are conducted in the established traditional manner, with students being introduced to the material being taught.
A brief introduction is mandatory at the beginning of each lecture, ensuring the necessary transition from one topic to another. In the process of introducing students to the new topic, a discussion is held with them in order to achieve continuity between the individual lectures and for them to come to their own conclusions that they can introduce into the new material.

Assessment: The discipline ends with an exam. The priority in the training is the practical and independent work of the students. The knowledge, skills and competence in the implementation of the current control are assessed, and the results achieved by the assigned tasks and tests are of great importance. The current control builds in the students responsibility for the assigned tasks, self-discipline, systematicity in preliminary preparation, builds habits for optimizing time, develops logical thinking, skills for selecting and analyzing information acquired from various information sources.

Registration for training in the discipline: an application is submitted to the Mathematics and Physics Department.
Registration for the exam: agreed with the teacher and the academic department.

References:

1. Илиев, Б., „Застраховане", изд. „Фабер", 2013;
2. Христозов, Ж., Димитров, П., „Застрахователни продукти", издателство на ВУЗФ, 2012;
3. Илиев, Б., Ерусалимов, Р., „Застрахователни продукти", изд. „Фабер", 2009;
4. Йотов, Й., Илиев, Б., „Основи на застраховането", Свищов, 2004;
5. Илиев, Б. и др., „Основни принципи на застраховането", изд. Свищов, 2008;
6. Драганов, Хр., Близнаков, Й., „Застраховане", изд. Тракия-М, 2000;
7. Драганов, Хр., Нейков, М., „Имуществено и лично застраховане", изд. Тракия-М, 2008;
8. Габровски, Р. и др., „Корпоративен риск мениджмънт", Свищов, 2004;
9. Георгиев, Р., "Управлението на риска и застраховането", учебно помагало http://www.rgeorgiev.com/p/blog-page_2744.html, 2010;
10. Василев, В., „Рисково-базиран надзор върху работата на неживото-застрахователните дружества в България", изд. „Фабер", 2010;
11. Наредба за реда и методиката за образуване на застрахователните резерви;
12. Застрахователен кодекс;

ECONOMETRICS

Semester: 1 semester
Course Type: lectures

Hours per Week: 2 lecture hours per week/Fall Semester
ECTS Credits: 4.5 credits
Department: Mathematics and Physics, Faculty of Natural Sciences and Mathematics, SWU "Neofit Rilski" – Blagoevgrad

Course Status: Optional course in M.Sc. Curriculum of Economic Mathematics

Course Description: The course "Econometrics" aims to build the theoretical foundations for understanding the problem related to the measurement of economic processes, testing economic theories, evaluating econometric models and their use in practice. The material is selected in accordance with the planned hours and the specifics of the specialty, and within the framework of a reasonable compromise between theoretical and empirical material, priority is given to the relationship between economic theory and the real possibilities for econometric analysis of the behavior of companies, consumers and macroeconomic processes in the economy.

Course Aims: The objective of the course is for students to acquire the necessary theoretical knowledge and practical skills, including the use of standard software, allowing for a correct empirical assessment of the economic behavior of the main economic entities, in the context of tasks arising at the micro and macro levels.

Teaching methods: lectures

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: an application is submitted to the Mathematics and Physics Department

Registration for the exam: coordinated with the lecturer and student Service Department

References:

1. Introduction in R language, 2013. http://www.r-project.org/
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

TECHNOLOGIES, COMPETITION AND BUSINESS STRATEGIES IN THE XXI CENTURY

Semester: 1 semester
Course Type: lectures
Hours per Week: 3 lecture hours per week/Fall Semester
ECTS Credits: 4.5 credits
Department: Mathematics and Physics, Faculty of Natural Sciences and Mathematics, SWU "Neofit Rilski" – Blagoevgrad

Course Status: Optional course in M.Sc. Curriculum of Economic Mathematics

Course Description: The course examines both classical approaches and methods of strategic analysis, as well as relatively newer topics on strategic innovations, creative solving of business problems, a new understanding of competition and cooperation in the ecosystem, differences with other points of view, approaches and methodologies. As a useful addition, topics on strategic audit of information systems are offered.

Course Aims: The aim of the course is to clarify and master basic theoretical knowledge and methods of the program material, to form skills for solving problems on the topics considered, examples and guidelines for applying the knowledge gained.

Teaching Methods: The lecture course is held in computer rooms or rooms with multimedia presentation capabilities, as well as with elements of the traditional method. The teaching also briefly presents the various schemes, approaches, and presentation options of a number of the most famous authors on the issues of the discipline, current sites and software products.

Prerequisites: This course does not require any prior knowledge or skills in the field of strategic management and the student's general knowledge at the level of a Bachelor of Science and/or Economics is sufficient.

Assessment: The main form of testing and assessing the students' knowledge is the written exam.
Registration for the Course: an application is submitted to the Mathematics and Physics Department.
Registration for the Exam: coordinated with lecturer and Student Service Department
References:
1. Василева А. Стратегическо планиране и управление.
http://www.bg-ikonomika.com/**2012**/_11/ strategichesko-planirane-i-upravlenie.html.
2. Василева А. Стратегическо мислене:
http://www.bg-ikonomika.com/**2012**/10/17_11.html
3. Христов Ст. Стратегическото мислене в бизнеса. "Данъчна практика" С. 2002 № 6,
4. Гибсън, Р., Преосмисляне на бъдещето,С. 2001.
5. Дракър, П., Практика на управлението, С. 2001.
6. Майкълсън, Дж., Сун Дзъ: Изкуството за войната за мениджъри, С. 2001.
7. Райс, А., Дж. Траут, Маркетинговые войны, М. 2000.
8 . Дракър, П., Мениджмънт предизвикателствата през 21 век, 2000.
9. The World Bank, World Development Report 2002.

10. Холанд, У., Промяната: стилът на XXI век, 2000.
11. Маринов, Р. Стратегически комуникационни подходи. Стратегически комуникации и управление на знанието, НБУ, 2009.
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12. Василева, А. Стратегически мениджмънт. http://www.bg-ikonomika.com/**2012**/10/ strategicheski-menidjmynt.html.
13. Василева А. Стратегическо планиране и управление. http://www.bg-ikonomika.com /**2012**/ 11/ strategichesko-planirane-i-upravlenie.html
14. Теорията на хаоса и стратегическото мислене. В сп.Геополитика
http://geopolitica.eu/drugi- statii/ 933-teoriyata-na-haosa-i-strategicheskoto-mislene С. **2010**
15. Ковачева, Р., Вл. Шопов. Как да мислим ЕС стратегически.
http://www.mediapool.bg/kak-da-mislim-es-strategicheski-news210523.html. С.2013
16. Антропов М. Стратегия и стратегическое мышление. М. 2012
17. Тасев, М. Синергетика и образование. Педагогика. Кн.10. 2001.

GAME THEORY

Semester: 2 semester
Course Type: lectures and tutorials
Hours per Week: 2 lecture hours and 2 tutorial hours per week/ Summer Semester
ECTS Credits: 5.0 credits
Department: Informatics, Faculty of Natural Sciences and Mathematics, SWU "Neofit Rilski" – Blagoevgrad

Course Status: Optional course in M.Sc. Curriculum of Economic Mathematics

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 Aims: The aim of the subject is for students to gain knowledge and skills in the field of game theory in economics. Game-theoretic modeling and various models of economic processes in a market economy are examined. These models lead to solving various types of games. Students are expected to be introduced to the basic properties of non-coalition finite and infinite games.

Teaching Methods: lectures and tutorials

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

Assessment: written final exam on two theoretical topics (grade weight is 60 %); two projects (grade weight is 40 %).
Registration for the Course: an application is submitted to the Mathematics and Physics Department.

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.

NONLINEAR DYNAMICS AND ECONOMICS

Semester: 2 semester
Course Type: lectures and seminars
Hours per Week: 2 lecture hours and 2 seminars hour per week/ Summer Semester
ECTS Credits: 5.0 credits
Department: Mathematics and Physics, Faculty of Natural Sciences and Mathematics, SWU "Neofit Rilski" – Blagoevgrad

Course Status: Optional course in M.Sc. Curriculum of Economic Mathematics

Course Description: The course includes basic concepts of nonlinear dynamics, nonlinear differential equations, systems, singular points, bifurcations, stability, catastrophe, chaotic dynamics, economic interpretation, the application of models for nonlinear dynamic systems to the description of economic processes and systems, some PC visualizations and software products, such as WinSet, etc.

Course Aims: The goal of the course "Nonlinear Dynamics and Economics" is to clarify and master basic theoretical knowledge and methods of the program material, to form skills for solving problems on the topics considered, examples and guidelines for applying the acquired knowledge in the learning process in various mathematical, economic and natural science disciplines.

Teaching Methods: Lectures and seminars. The lecture course is held in computer rooms or rooms with multimedia presentation capabilities, as well as with elements of the traditional method. The teaching briefly presents the various schemes, approaches, and presentation options of a number of the most famous authors on the issues of the discipline, as well as current websites and software products.

Prerequisites: Basic knowledge of mathematical analysis, linear algebra and analytic geometry, ordinary and partial differential equations, probability theory and mathematical statistics, etc. is required.

Assessment: The main form of testing and assessing students' knowledge is the written exam.

Registration for the Course: an application is submitted to the Mathematics and Physics Department.

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

References:

1. Puu, T. Nonlinear Economic Dynamics. Springer-Verlag Berlin Heidelberg . 1997. (Пуу, Т. Нелинейная экономическая динамика . РХД, Ижевск. 2000)
2. Панчев, Ст. Теория на хаоса (с примери и приложения), ИК "АИ "Проф. М. Дринов"", 2002.
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4. Милованов, В. Синергетика и самоорганизация. Экономика. Бифозика. Москва, 2005.
5. Лысенко Ю.Г., и др. "Економическая динамика" , Донецк: ДГУ, 2000 .
6. Сергеева, Л. "Нелинейная економика: модели и методы", Запорожье, Полиграф, 2003.
7. Lorenz , Hans-Walter. Nonlinear dynamical economics and chaotic motion , Springer-Verlag, 1993
8. Goodwin, R. Chaotic Economic Dynamics, 1990.
9. Dechert , D. Chaos Theory in Economics: Methods, Models and Evidence.1996
10. Мандельброт, Б. "Фракталы, случай и финансы"."Регулярная и хаотическая динамика",2004.
11. Zhang W-B. Synergetic Economics . Time and Change in Nonlinear Economics Springer Sprier in Synergetics .; Занг, В.-Б. Синергетическая икономика. Время и перемены в нелинейной экономической теории. http://bookfi.org/book/731035
12. Васин,В , А.Ряшко. Элементы нелинейной динамики.: ОТ порядка к хаосу. М.-И. , 2006.
13. Haken, H. Synergetics: from physics to economics. Cambridge University Press. 2009.
14. Тасев, М. Синергетика и образование. Педагогика. Кн.10. 2001.

TIME SERIES

Semester: 2 semester
Course Type: lectures and seminars
Hours per Week: 2 lecture hours and 2 seminars hour per week/ Summer Semester
ECTS Credits: 5.0 credits
Department: Faculty of Economics, SWU "Neofit Rilski" - Blagoevgrad

Course Status: Optional course in M.Sc. Curriculum of Economic Mathematics

Course Description: The course introduces students to the study of strategic decision making. This apparatus is a fundamental method used in mathematical economics and business to model the behavior of competitive interacting agents.

Course Aims: The course "Time Series" aims to provide students with knowledge and skills in the field of time series and forecasting. Regression models are considered. These models lead to solving various problems and using different mathematical software. The course will

demonstrate some software packages for processing data obtained from various scientific research activities. The created models will be tested in practice.

Teaching Methods: lectures and seminars

Requirements/Prerequisites: Students should have knowledge and skills for calculations in the financial field.

Assessment: Written exam. Students take two tests during the semester. After the end of the semester, a written exam and an interview are held for a final grade.

Registration for the Course: an application is submitted to the Mathematics and Physics Department.

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.
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