Doctoral Study – criteria of enrolment and Catalogue of the courses

1. SCIENTIFIC-RESEARCH DOCTORAL PROGRAM (PhD PROGRAM)

1.1. INTRODUCTION

The aim of the PhD programs in Economics and Management/Business is to prepare candidates for teaching and research positions in academic institutions in the fields of Economics and Business. The programs provide a solid theoretical background in the selected area of specialization (Economics and Management/Business) as well as competence in conducting research.

The requirements of the PhD program are the successful completion of seven courses organized according to the system of continuous assessment that is already applied at the undergraduate and graduate – master program, followed by a doctoral dissertation and its oral defence.

The course work in PhD program consists of the following courses:

a) Two Research Methods courses (Research Methods I, Research Methods II)
b) Two or three area elective courses
c) Two or three unrestricted elective courses
d) Three seminars
e) Research paper.
All courses must be completed in first year.

1.2. PhD PROGRAM IN ECONOMICS

Curriculum:

First year:

Research Methods I (Econometrics)	10	Research Methods II	10
Advanced Macroeconomy	10	Advanced Microeconomy	10
Course from Elected Area	10	Elected Course	10
Total	**30**	**Total**	**30**

Second year:

Work on dissertation	10	Work on dissertation	10
Seminar I – Dissert Proposal	5	Seminar II – Progress Report	10
Work on dissertation – Preparing Project proposal	15*	Work on dissertation - Preparing Project proposal	10
Total	**30**	**Total**	**30**

**** 5 of 20 points for Work on dissertation***

Third year:

Work on dissertation	20**	Work on dissertation	20***
Presentation of First version of Dissertation	10	Dissertation Defence	10
Total	**30**	**Tota**	**30**

**** 5 of 20 points for Work on dissertation***
****** 10 of 20 points for Work on dissertation***

ECTS distribution:

Courses - 60 ECTS
Work on dissertation - 95 ECTS
Seminars - 15 ECTS
Defence - 10 ECTS

Total: - 180 ECTS

The students can select elective courses with a permission of his/her supervisor and head of doctoral program.

1.3. PhD PROGRAM IN BUSINESS

Curiculum:

First year:

Research Methods I (Quantitative and Qualitative Research Methods)	10	Research Methods II	10
Decision Analysis	10	Course from Elected Area	10
Course from Elected Area	10	Elected Course	10
Total	**30**	Total	**30**

Second year:

Work on dissertation	10	Work on dissertation	10
Seminar I – Dissert Proposal	5	Seminar II – Progress Report	10
Work on dissertation – Preparing Project proposal	15*	Work on dissertation - Preparing Project proposal	10
Work on dissertation	10	Work on dissertation	10
Total	**30**	Total	**30**

Third year:

Work on dissertation	20**	Work on dissertation	20***
Presentation of First version of Dissertation	10	Dissertation Defence	10
Total	30	Total	30

ECTS distribution:

Courses - 60 ECTS
Work on dissertation - 95 ECTS
Seminars - 15 ECTS
Defence - 10 ECTS

Total: - 180 ECTS

The students can select elective courses with a permission of his/her supervisor and head of doctoral program.

2. ADMISSION AND ACADEMIC REGULATIONS

2.1. ADMISSION REQUIREMENTS AND SELECTION CRITERIA:

Entrance examination consists of the oral examination (70%) and previous record (30%).

2.1.1. MINIMUM REQUIREMENTS:

a) A Minimum of Grade Point Average (GPA) of 8 (C) or equivalent..
b) Proof of English Proficiency Two reference letters
c) Proposal of area and goals of the researcch
d) Motivation letter – reasons and motives for doctoral program enrolent.

2.1.2. PREREQUISITES:

For both programs:

The students who have completed second cycle program (Bologna Master degree) or preBologna master program in area of Economics and/or Management/Business.

At the moment of en

Studentis have to sign Learning agreement where all obligations and rights of the School of Economics and Business as well as students of the Doctoral program are defined.

2.2. STUDY REQUIREMENTS

The proposed academic program requires the student to fulfill prescribed academic requirements. Individual students' success is evaluated through exams and individual assignments. Immediately after enrollment in the doctoral program, at the proposal of the head of the doctoral program, the doctoral studies committee appoints the student's advisor. The committee takes the student's wishes into account as much as possible. For appointment of the advisor, the major selected and the area that the student plans to focus on are of key importance. In addition to appointing the advisor, the doctoral studies committee also appoints two members of the committee to evaluate the dissertation proposal. The advisor guides the student in selecting organized forms of study and in drafting the dissertation proposal (a research project) in the first year. The student submits the draft proposal to the proposal evaluation committee at the end of the third semester and publicly presents it in an academic seminar. 20 ECTS credits completed of obligatory courses of study are conditions for continuing the doctoral program with enrollment in the second year..

In the second and third year, the doctoral student is required to attend all research seminars. It is expected that he will actively participate in academic conferences of appropriate quality. 10 ECTS credits completed of obligatory course of study (Research method II) in the second year is the condition for continuing the doctoral program with enrollment in the third year. Before defending his dissertation, the student must complete all 70 ECTS credits of organized forms of study and fulfill the requirements regarding articles.

Immediately after enrollment in the third year of the doctoral program, as a rule the members of the dissertation proposal evaluation committee are appointed as members of the dissertation evaluation committee, in which the advisor continues his role as advisor. At least one member of the dissertation evaluation committee must not be employed at University of Sarajevo and preferably should be from member's academic institutions of the network. In the second and third years, the doctoral student is required to fully inform (if possible, orally and in writing) the other two members of the committee at least twice regarding his work and findings. The other two members of the committee are expected to take the role of critics, providing a critical assessment of the student's work and adding their comments and suggestions.

These are also forwarded to the advisor. Research Paper Requirement: Research paper should be published or accepted for publication before the defence. The School will define the list of relevant journals. This paper is expected to qualify as a chapter of the dissertation.

Research Paper Requirement: Research paper should be published or accepted for publication before the defence. The School will define the list of relevant journals. This paper is expected to qualify as a chapter of the dissertation.

2.3. DOCTORAL DISSERTATION

The doctoral dissertation is possible in one of two forms. A doctoral dissertation as a collection of published articles, articles accepted for publication, and published material is a collection of scholarly material in a particular area to which an introduction and conclusion are provided. A doctoral dissertation in the form of a monograph is a broad, comprehensive, and in-depth treatment of particular issues in the field.

2.4. AKADEMIC QUALIFICATION

To complete the program, the student must fulfill all academic requirements for all organized forms of instruction in the academic program and the major, and must successfully defend his doctoral dissertation. When he has fulfilled all of the educational and research requirements defined by the academic program, the student in the Doctoral Program in Economics and Business receives the title doktor nauka - znanosti/doktorica nauka - znanosti (Doctor of Philosophy, Ph.D.).

2. CURICULUM

A) COURSES OF THE RESEARCH METHODOLOGY AREA

Code	**Research Methodology I**		
Level	**Year**	**Smester**	**ECTS credits:**
Status: Obligatory	**Hours/Week:**		**Total hours:**
Responsible Professor			
1. Goals of the course	The goal of the course is to develop students' capabilities for planning and implementing methodologically correct and for the practice relevant empirical research in business and exonomy. Students have to achive solid base for working on individual and group research projects, and learn how to use results of the research published by others group or institution (i.e. Other scientifics and research institutions, government istitutions, and media). Teaching results: – Improving overall and specific knowledge in area of research methodology – Improving software skills. Further defelopment of the skills of debating, writing and presenting.		
1.1. Content	1. Introduction – research defining, research process, research problem determination: choic, understanding, designing, research and types of research design. 2. Designing of the sample: phases in the sample designing, characteristics of the good designed sample, types of samples 3. Measurement and techniques of measurement 4. Data collecting: primary data (opservation studies, experimentak studies, anquete) and secondary data (sources of secondary data, techniques of searching and evaluation) 5. Data analysis 1 – measurement of central tendencies; data dispertion 6. Data analysis 2 – correation and regression analysis, time series 7. Hypothesis testing: defining of hypotheses, t test, u test, ANOVA 8. Testiranje hipoteza: definisanje i formulacija hipoteza, t test, z test, ANOVA 9. Multivariante analysis 1 – classification, factoral analysis cluster analysis 10. Multivariante analysis 2 – discriminant analysis, multidimensional scaling, conjoint analysis 11. Research report writing: interpretation techniques, importance of		

	Report writing, form and types of reports.
2. TEACHING/ASSESSMENT	
Description	
2.1. Teaching methods	Ex catedra, tutorials and excesises in the class and informatics lab, seminars. All methods include students' presentations and discussions about previously defined individuals and group tasks
Description	
2.2. Student assessment methods	Formal evaluation provides based on the participation in lecturing, individual and group tasks, written exam and seminar work (draft proposal).
3. LITERATURE	1. Frankfort-Nachmias Chava and Nachmias David (2000): Research Methods in the Social Sciences. New York: Worth Publishers. 2. Greenfield Tony, ed. (2003): Research Methods for Postgraduates. London: Arnold.

3. CURICULUM

B) COURSES IN METHODOLOGY RESEARCH

Code	Research Methodology		
Level	**Year**	**Semester**	**ECTS credits**
Statuse: Obligatory	**Hours/Week**		**Total hours**
1. Goals of the course	This course aims to develop students' abilities to design and carry out methodologically sound and practically relevant empirical research in business and economics. It is designed to give students a solid foundation for working on individual and group research projects and the ability to be informed users of research results presented and/or published by others (e.g. fellow researchers and research institutions, governments, press). Learning outcomes: – Enhanced general and specific knowledge in the field of research methodology. – Enhanced software skills. Further development of debating, writing, and presentation skills.		
1.1.Content	1. Introduction – research defining, research process, research problem determination: choic, understanding, designing, research and types of research design. 2. Designing of the sample: phases in the sample designing, characteristics of the good designed sample, types of samples 3. Measurement and techniques of measurement 4. Data collecting: primary data (opservation studies, experimentak studies, anquete) and secondary data (sources of secondary data, techniques of searching and evaluation) 5. Data analysis 1 – measurement of central tendencies; data dispertion 6. Data analysis 2 – correation and regression analysis, time series 7. Hypothesis testing: defining of hypotheses, t test, u test, ANOVA 8. Testiranje hipoteza: definisanje i formulacija hipoteza, t test, z test, ANOVA 9. Multivariante analysis 1 – classification, factoral analysis cluster analysis 10. Multivariante analysis 2 – discriminant analysis, multidimensional scaling, conjoint analysis 11. Research report writing: interpretation techniques, importance of Report writing, form and types of reports.		
2. TEACHING/ASSESSMENT+			

Description	
2.1. Teaching methods	Ex catedra, tutorials and excesises in the class and informatics lab, seminars. All methods include students' presentations and discussions about previously defined individuals and group tasks
Description	
2.2. Assessment methods	Formal evaluation provides based on the participation in lecturing, individual and group tasks, written exam and seminar work (draft proposal).
3. LITERATURE	3. Frankfort-Nachmias Chava and Nachmias David (2000): Research Methods in the Social Sciences. New York: Worth Publishers. 4. Greenfield Tony, ed. (2003): Research Methods for Postgraduates. London: Arnold.

Code:	**Course: RM I Qualitative and quantitative research methods**		
Level	**Year:**	**Semester:**	**Number of ECTS credits:**
Status: Obligatory	**Week hours:**		**Total number of hours:**
Responsible Professor			
1. GOALS OF THE COURSE	The course aims at providing students with the methodological knowledge and the practical capabilities for designing and carrying out qualitative studies. Students shall acquire the theoretical foundations as well as skills to effectively apply qualitative and mixed (qualitative-quantitative) methods in research projects in the business disciplines. Completion of and thoughtful engagement with readings, comprehensive literature research, effective self-organization and fair team-work as well as regular, reliable reporting throughout the course are expected. Course Description The course addresses students participating in the doctoral study program at the School of Economics and Business in Sarajevo. It introduces participants to qualitative approaches in data collection & analysis and shows how they can be linked with quantitative methods. Starting from a methodological basis, participants will be actively guided through the qualitative research process in their own practical cases. They will learn how to realize and report qualitative research. Additionally, potential questions and practical problems experienced by students in their doctoral research projects will be discussed.		
1.1. Main topics	1. Research problems, approaches and strategies 2. Secondary data, surveys and questionnaire design 3. Qualitative methods: interviews and case studies 4. Overview of quantitative research methods 5. Assumptions of quantitative analysis, Data description, Visualization 6. Quantitative methods: Multiple regression, Modelling, Causality 7. Quantitative methods: Measurement and Factor analysis 8. Advanced Quantitative methods: SEM, Bayesian, „Big Data“		
2. TEACHING/GRADING			
Description (%)			
2.1. Teaching methods	Ex cathedra lecturing and seminars		
Structure of the grade (%)			

2.2. Grading Methods	1. Pre-Course Assignment for qualitative research (a position paper) (20%) (during classes) 2. Methodological review of two published papers (30%) - Describe the research problems, methodology, and the arguments provided by the authors for the methods chosen in the research projects described in the papers. Discuss these arguments as well as potential problems of the methodology chosen and the way it has been implemented in the projects described. Which conclusions can you draw from this discussion for your own (potential) research project(s)? 3. Proposal for Method chapter for research (50%) - research problem definition; overall research design (has to include qualitative research); draft of questioner; explanation of data collection methods; methods for data analysis and sample selection methods
3. LITERATURE	– Greener, Sue: Business Research Methods. Downloadable at http://bookboon.com/en/textbooks/marketing-media/introduction-to-research-methods – Flick, Uwe (2006). An Introduction to Qualitative Research, 3rd ed, Sage, London et al. – Shukla, Paurav: Essentials of Marketing Research. Downloadable at http://bookboon.com/en/textbooks/marketing-media/marketing-research-an-introduction – Hair J.F., Black W.C., Babin B.J. and Anderson R.E. (HBBA): Multivariate Data Analysis.

Code:	**Course: RM I Applied Econometrics**		
Level	**Year:**	**Semester:**	**Number of ECTS credits:**
Status: Obligatory	**Week hours:**		**Total number of hours:**
Responsible Professor			
1. GOALS OF THE COURSE	Course Description In order to understand the complicated economic and business environment it is vital to be able to competently quantify and analyse economic and business data. Econometrics is one of the most comprehensive approaches to achieve this goal. The purpose of this course is to give some insights into the multiple regression analysis, to introduce regression models with dummy explanatory variables, to demonstrate the issue of endogeneity and introduce instrumental variables estimation, and to introduce time series modelling and forecasting, in particular the Box-Jenkins approach and vector autoregression. The analysed topics are applied to data in various examples. After completing this course, the student should be able to set up independently his research problem and, with additional study of the methodological topics used in his analysis, perform the applied regression analysis.		
1.1. Main topics	1. Insights into the multiple regression analysis 1.1Properties of the least squares estimator 1.2Simulations: Monte Carlo experiments 1.3More on interpretation of model parameters 1.4Quadratic regression model 1.5Regression models with dummy explanatory variables 1.6Comparison of regression models 2 Instrumental variables estimation 2.1Insights into the issue of endogeneity 2.2Instrumental variables estimator 2.3Finding instrumental variables 2.4Two stage least squares estimator 2.5Testing for overidentifying restrictions 2.6Testing for endogeneity		

	3 Time series modelling and forecasting 3.1Insights into the issue of stationarity 3.2Autoregressive processes 3.3Moving average processes 3.4Autoregressive moving average processes 3.5Box-Jenkins modelling approach 3.6Extensions to ARMA models 3.7Vector autoregression 3.8Structural versus standard form VAR models 3.9Interpretation of VAR models 3.10Ordering of the variables in VAR models
2. TEACHING/GRADING	
Description	
2.1. Teaching methods	The course consists of four lectures and four computer exercises. Methodological approaches that are taught at any given lecture are then demonstrated at the subsequent computer session. We shall use chapters from Gujarati and Porter (2009), Wooldridge (2013) and Brooks (2014) as recommended readings and Stata econometric software for computer exercises
Structure of the grade	
2.2. Grading Methods	Take-home final exam, comprised of three exercises
3. LITERATURE	.Gujarati, D. N. and D. C. Porter: *Basic Econometrics: Fifth Edition*. New York, NY: McGraw-Hill/Irwin, 2009. [Chapters 9 and 21]. *2.Wooldridge, J. M.: Introductory Econometrics: A Modern Approach. Fifth Edition.* Mason: South-Western College Publishing, 2013. [Chapter 15].*3.Brooks, C.: Introductory Econometrics for Finance: Third Edition. Cambridge: Cambridge University Press, 2014. [Chapters 6 and 7]*. Additional study materials will be distributed during the course as necessary.

Code:	**RM II MODELING STRUCTURAL EQUATIONS AND APPLIED ECONOMETRICS**		
Level	**Year:**	**Semester:**	**Number of ECTS credits:**
Status: Obligatory	**Week hours:**		**Total number of hours:**
Responsible Professor			
1. GOALS OF THE COURSE	The course offer customized introduction in Structura equation modelling (SEM) by using LISREL program. This program is designed for non-expert users with an emphasis on understanding and applying SEM as an instrument in the substantive research.		
Prerequisites	The course is for students of Doctoral program and requests previous knowledge in the data analysis and statistics area (including factoral analysis and regression).		
1.1. Main topics	1. Introduction to the main steps in the formulation and testing of models according to LISREL 2. Description of the most important decisions related to each individual step - identification of potential problems and limitations related to LISREL modeling 3. Participation in interpretation of input and output of LISREL files. The ultimate goal is to enable critical understanding of LISREL modeling and what it really entails, and to develop reader sensitivity to models of "mechanical" tuning or modification. 4. Resaech design: concept and challenges - Measurement models and operationalization of business research - Structural models with application in business: basics of SEM analysis 5. Econometric techniques and methods in economics - Time Series Analysis-Applied Econometric Research - Panel analysis - applied econometric research 6. - Dynamic Panel - Econometric Research Applied		
2. TEACHING/ ASSESSMENT			
	Description		
2.1. Teaching methods	The course will be organized in the form of interactive workshops, with an emphasis on the student participation. Theoretical discussion about main elements of structural equation modelling will be completed with the practical demonstration of LISREL program using. Students will get instruction of installing and interpretation relevant input/output program files. Students supposed to download (free) student version of LISREL program. Predmet će biti organizovan u obliku interaktivnih radionica, uz naročit naglasak na učešće studenata. Teoretska rasprava o glavnim odrednicama modeliranja strukturnih jednačina će biti upotpunjena praktičnom demonstracijom upotrebe LISREL programa. Studenti će dobiti i smjernice za instaliranje i interpretaciju relevantnih input/output programskih fajlova. Od studenata se očekuje da downloaduju (besplatnu) studentsku verziju LISREL programa		

	(www.ssicentral.com) and to use literature from this area (list is below). During the modul realization concrete/practical examples are using for the illustration key elements of the conceptualization, specification identification, projection, evaluation, modification and cross-validation of the model: that will result with the real program output.
Description	
2.2. Assessment methods	Assessment will be in the form of the project about using LISREL for projection and evaluation of the structural equation odel. Detail information will be provide on the first class. Practical wor: SEM analysis applying Practical work: Applying chosen methods in STATA
3. LITERATURE	Obligatory literature: Diamantopoulos, A. and Siguaw, J.A. (2000): *Introducing LISREL,* Sage Publications Cameron, A. C. and Trivedi, P. K. **Microeconometrics: Methods and Applications** by Cambridge University Press (2005) *Additional literature:* Anderson, J. C. & Gerbing, D. W. 1988. Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach. *Psychological Bulletin*, 103: 411-423. Bagozzi, R. P. & Yi, Y. 1988. On the Evaluation of Structural Equation Models. *Journal of the Academy of Marketing Science*, 16(1): 74-94. Baumgartner, H. and Homburg, C. 1996. Applications of Structural Equation Modelling in Marketing and Consumer Research. A review. *International Journal of Research in Marketing*, 13: 139-161. Danes, J.E. and Mann, K.O. 1984. Unidimensional Measurement and Structural Equation Models with Latent Variables. *Journal of Business Research*, 12: 337-352. Diamantopoulos, A. & Winklhofer, H. 2001. Index Construction with Formative Indicators: An Alternative to Scale Development. *Journal of Marketing Research*, 37: 269-277. Ping R.A. Jr. 2004. On Assuring Valid Measures for Theoretical Models Using Survey Data. *Journal of Business Research*, 57(2): 125-141. Steenkamp, J. B. E. M. & Baumgartner, H. 2000. On the Use of Structural Equation Modelsf or Marketing Modelling. *International Journal of Research in Marketing*, 18: 195-202. Steenkamp, J. B. E. M. & van Trijp, H. C. M. 1991. The Use of LISREL in Validating Marketing Constructs. *International Journal of Research in Marketing*, 8: 283-299. Nathaniel Beck and Jonathan N. Katz. 2011. "Modeling Dynamics in Time-Series-CrossSection Political Economy Data." Annual Review of Political Science 14: 331–52. Jon C. Pevehouse and Jason D. Brozek. 2008. "Time-Series Analysis." In The Oxford Handbook of Political Methodology, chapter 19 Gary King, Michael Tomz, and Jason Wittenberg. 2000. "Making the Most of

	Statistical Analyses. Improving Interpretation and Presentation." American Journal of Political Science 44(2): 347–361. Catherine Hausman and David S. Rapson. 2018. "Regression Discontinuity in Time: Considerations for Empirical Applications." Annual Review of Resource Economics 10(21): 1–20. Additional materials will be distributed during the semester. Useful web pages (www.upa.pdx.edu/IOA/newsom)

A) OBLIGATORI COURSES IN ECONOMY

Code:	**ADVANCED MICROECONOMICS**		
Level	**Year**	**Semester**	**ECTS credits**
Statues: Obligatory	**Hours/Week**		**Total hours**
Responsible Professor			
1.Goals of the Course	The purpose of the course is to give an introduction to some of the main topics in this field: adverse selection (signaling, screening), moral hazard, mechanism design, and communication in organizations. First, the course focuses on the role of private information in people's incentives to work (or to shirk), to distinguish themselves and to communicate (or to lie). Second, it studies the question of how to design optimal mechanisms, compensation schemes and organizations given people's private information. Learning outcomes: – Enhanced general and specific knowledge in the field of information economics and contract theory		
1.1. Prerequisites	Introduction in Microeconomics and Game Theory		
1.2. SADRŽAJ	1. Information economics (a) Adverse Selection (b) Signaling and Screening (c) Reputation and Cheap Talk Games (d) Non-linear Pricing 2. Contract theory (a) Moral Hazard and Optimal Incentive Contract (b) Dynamic Moral Hazard (c) Implicit Incentive and Career Concerns (d) Property Right and Incomplete Contract Theory (3) Mechanism Design and Auctions (a) Basic Mechanism Design (b) Efficient Mechanism (c) Auction 4. Communication and Organizational Design (a) Computer science approach (b) Incentive approach		
2. TEACHING/ASSESSMENT			
Description			
2.1. Teaching methods	Lecturing, excesis, seminars		
Description			

2.2. Assessent methods	Formal assessment is based on the participation in the class work, individual and group tasks, written final exam.
3. LITERATURA	Mas-Colell, Whinston, & Green (MWG), 1995, *Microeconomic Theory*. Milgrom and Roberts (1992), *Economics, Organization and Management*. Fudenberg, D. and J. Tirole (1991), *Game Theory*, Cambridge: MIT Press. Laffont and D. Martimort, (2001), *The Theory of Incentives*, Princeton University Press.

Code:	**ADVANCED MACROECONOMICS**		
Level:	**Year_**	**Semester**	**ECTS credits**
Statuse: Oblligatory	**Hors/Week**		**Totak hours**
Responsible Professor			
1. Goals of the cours	The first part of this course will concentrate on developing the tools and concepts necessary to understand the modern macroeconomic theory — discrete time dynamic programming and continuous time optimal control. The study of specific models will take aback seat to mastering the techniques		
1.1. Prerequisites			
1.2. Content	1. Overview of the Macroeconomics. 2. Dynamic Programming and Optimal Control − Discrete Time Dynamic Programming − Continuous Time Optimal Control 3. Applications − Consumption and Savings - Ramsey model − One-Sector Model of Economic Growth − Investment with Adjustment Costs 4. Numerical Solution Methods − Value Function Iteration − Policy Function Iteration − LQ Problem − Log-Linearization 5. Competitive equilibrium with complete markets 6. Ricardian equivalence 7. Fiscal Policies in Growth Model 8. Recursive Competitive Equilibria 9. Asset Pricing 10. Optimal Taxation with Commitment 11. Fiscal-Monetary Theories of Inflation		
2. TEACHING/ASSESSMENT			
Description			
2.1. Teaching metods	Method of teaching will be lectures combined with exercise sessions.		
Description			
2.2. Assessment methods	There will be 6-7 graded problem sets, a midterm and a final. The weights are: Problem Sets: 10% Midterm: 40% Final: 50%		

3. LITERATURE	**Obligatory literature:** B D. Bertsekas: *Dynamic Programming and Optimal Control*, Athena Scientific, 2005. BF Blanchard, O. and S. Fisher: *Lectures on Macroeconomics*. MIT Press, 1989. LS Ljungquist, Lars, and Thomas J. Sargent: *Recursive Macroeconomic Theory*. Cambridge: MIT Press, 2000. SL Stokey, Nancy L., Robert E. Lucas, Jr., and Edward C. Prescott: *Recursive Methods in* *Economic Dynamics*. Cambridge: Harvard University Press, 1989. Ljungquist, Lars and Thomas J. Sargent: Recursive Macroeconomic Theory. First Edition. MIT Press. 2000. Ljungquist, Lars and Thomas J. Sargent: Recursive Macroeconomic Theory. Second Edition. MIT Press. 2004 **Additional literature:** Kamien, Morton I. and Nancy L. Schwartz: *Dynamic Optimization. The Calculus of Variations and Optimal Control in Economics and Management*. Amsterdam: Elseiver, 1991. Michael D. Intrilligator: *Mathematical Optimization and Economic Theory.* Philadelphia: SIAM, 2002. **Articles:** Blanchard, O., "What Do We Know About Macroeconomics that Fisher and Wicksell Did Not?" QJE, November 2000, 115:4, 1375-1410. Woodford, M., "Revolution and Evolution in Twentieth-Century Macroeconomics," forthcoming in P. Gifford, ed., Frontiers of the Mind in the Twenty-First Century, Harvard University Press. (Available at www.princeton.edu/~woodford/macro20c.pdf)

C) OBAVEZNI PREDMETI U OBLASTI BIZNISA

Code:	**DATA ANALYSIS**		
Level:	**Year:**	**Semester**	**ECTS credits**
Satuse: Obligatory	**Hours/Week**		**Total hours**
Responsible Professor			
1. GOAL OF THE COURSE	This course gives a thorough introduction into fundamental concepts of decision theory. The focus of the course is on methods for decision making and their axiomatic foundation. Software packages that are used in decision modelling and analysis are used to provide functionality of decision analysis models. These theoretical concepts are linked to empirical results to discuss their empirical validity and the possibility to apply them in a real world setting, or use them as the basis for applied research projects		
1.1. Prerequisites			
1.2. CONTENT	1. Introduction to preference modeling: Relations and scales 2. Multidimensional evaluation Dominance and efficiency 3. Decisions under risk: Introduction to expected utility theory 4. Applications and extensions to expected utility theory 5. Dynamic decision problems and the value of information 6. Multicriteria decisions: additive models 7. Multicriteria decisions: Non-compensatory models		
2. TEACHING/ASSESSMENT			
Description (%)			
2.1. Teaching methods			
Description (%)			
2.2. Assessment methods	Assignments (20%) Project (40%) Final exam (40%)		
Literature	Winston, W.L., Albright, S.C., Practical Management Science, Duxbury – Thomson Learning, 2001. Raqsdale, C., Spreadsheet Modeling & Decision Analysis: A Practical Introduction to Management Science, South- Western College Pub, 2007.. Goodwin, P., Wright, G., Decision Analysis for Management Judgment, Wiley 2004. Edwards, W., Miles, R.F., Winterfeld, D., Advances in Decision Analysis: From		

LIST OF ELECTIVE COURSES IS IN THE ATTACHED DOCUMENT