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| **uns** | **University of Novi Sad**  **Faculty of Agriculture** | | **Polj** |
| **Accreditation of the programme of study** | |
| DOCTORAL STUDIES | DOCTORAL STUDIES |

**Table. 5.1** Course Specification for doctoral studies program

**Table 5.1** Course Specification for doctoral studies program

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Course: The Methods of Scientific Research** | | | | | |
| **Course Code:** 3DAG1O01 | | | | | |
| **Lecturer(s)**(surname, middle initial, name)**:** Radovan V. Pejanović, PhD, professor, Nedeljko Lj. Tica, PhD, professor, Novković Đ. Nebojša, PhD, professor | | | | | |
| **Course status:** Obligatory | | | | | |
| **ECTS:** 5 | | | | | |
| **Condition:** None | | | | | |
| **Course aims:**  Introducing studentsto the methodsof scientific research. | | | | | |
| **Course outcome**  Students are trained to plan, design and implement research projects. | | | | | |
| **Course contents**  *Theoretical study*  *The first part*-Scienceand methodology:Scienceand its rolein society; Methodology and methodsasa craft and toolinsocio-economic research; Libraryin scientific work; The general methodsof researchin the socio-economic (and agroeconomic) science; Somemethodologicalstagesandproceedingsin the economy(and agroeconomic); Scientifichypotheses in(agro)economic research; Method ofeconomics. *The second part*-MicroeconomicResearch: Economic analysisas aresearch methodin economic(and agroeconomic) science; Research and development activitiesof companies; Scientificpredictionas a factorof successful business; Strategic planning in companies; Methods and techniquesof strategicenterprise management; SWOTanalysisin business activities(agro)industrialenterprises; Challenges of the neweraand a new economy. *The third part*-Methodological aspectsof economic theory: Different methodologicalapproachesto economic theory; Homooeconomicusandsocialdevelopmentparadigm. | | | | | |
| **Recommended literature**   1. Pejanović, R. (2010): Uvod u metodologiju ekonomskih nauka, Poljoprivredni fakultet, Novi Sad. 2. Borojević, S. (1978): Metodologija eksperimentalnog naučnog rada, Radnički Univerzitet „Radivoj Ćirpanov”, Novi Sad. 3. Sarić, M. (1985): Opšti principi naučnog rada, Naučna knjiga, Beograd. 4. Šomođi Š, Novković N, Kraljević-Balalić Marija, Kajari Karolina (2004): Uvod u naučni metod, Univerzitet u Novom Sadu, Poljoprivredni fakultet, Novi Sad. 5. Excerptsfrom thelectures andexercises inselectedtextbooks. | | | | | |
| Number of teaching hours | Lectures: **4** | | | Student research work: **0** | |
| **Teaching strategies**  Lecturesand preparingfortestsusing modernteaching methods. Verification of the theoreticalknowledge.Individual workon solvingproblems inpractical classes.Verification of the practical knowledge.Individual consultationsontheoretical /practical training andpreparingseminar papers. | | | | | |
| **Knowledge assessment (maximumpoints: 100)** | | | | | |
| **Pre exam duties** | | **Points (50)** | **Final exam** | | **Points(50)** |
| Practical study | | 10 | Written exam | | 20 |
| Tests | | 20 | Oral exam | | 30 |
| Seminars | | 20 |  | |  |

**Table 5.1** Course Specification for doctoral studies program

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Course: ECONOMICS** | | | | | |
| **Course Code:** 3DAG1I11 | | | | | |
| **Lecturer(s)**(surname, middle initial, name)**:**Pejanović V. Radovan, PhD, professor | | | | | |
| **Course status:** Elective | | | | | |
| **ECTS:** 10 | | | | | |
| **Condition:** None | | | | | |
| **Course aims:**  PhDstudentswill be familiar with themodern theoreticalconcepts ofmicroeconomicsand macroeconomics, i.e. microeconomicandmacroeconomic policies insome countries. | | | | | |
| **Course outcome**  Candidatesshould learn aboutrecent theoreticalconceptsof microeconomicsand macroeconomics, i.e. microeconomicandmacroeconomic policies inindividual countries and should be qualified to workin the institutions, governmental agencies, chambers of commerce and associations. | | | | | |
| **Course contents**  *Theoretical study*  Social Accounting; Keynes macroeconomic analysis; Modern post-Keynesian macroeconomic analysis; Modern post-Keynesian macroeconomic policy, Monetarism; Inflation, aggregate demand and aggregate supply; Macroeconomics of generated economy; Long-term economic growth; Regulatory functions of the state; Term and goal of microeconomics, Microeconomics basic categories; Market and prices (term and concept of market price); Optimization and equilibrium; Supply curve and demand curve; Market mechanism; Market equilibrium changes; Preferences (consumer preferences, indifference curves, the consumer's choice), Utility (concept, functions, marginal utility); Choice (optimal choice, choice under uncertainty and risk); Production (production functions, production of a single variable factor; production with two variable factors, yields on production volume), Profit maximization; Cost minimization; Competitive market analysis; Market structure and market power; Market of production factors; Externalities; Public goods; Asymmetric information.  *Practical study*  Applying a comparative approach on the study of macroeconomic and microeconomic policies in individual countries and at different times in our country. | | | | | |
| **Recommended literature**   1. Pejanović, R. (2012): Uvod u (mikro)ekonomiju, Poljoprivredni fakultet, Novi Sad. 2. Pejanović, R. (2007): Principi ekonomije, Poljoprivredni fakultet, Novi Sad. 3. Samuelson, P., Nordhaus, N. (2000): Ekonomija, petnaesto izdanje, Mate, Zagreb. 4. Burda i Viploš (2004): Makroekonomija, treće izdanje, CLDS, Beograd. 5. Blanchard, O. (2005): Makroekonomija, treće izdanje, Mate, Zagreb. 6. Mankiw, N.G. (2005): Makroekonomija, peto izdanje,CEKOM books, Novi Sad. 7. Hal R. Varijan (2003): Mikroekonomija, peto izdanje, Ekonomski fakultet, Beograd. 8. Pindyck, R., Rubinfeld, D. (2005): Mikroekonomija, peto izdanje, Mate, Zagreb. | | | | | |
| Number of teaching hours | Lectures: 2 | | | Student research work: 6 | |
| **Teaching strategies**  Classical methodswith activeparticipation of studentsin creativegroups, seminar papers. | | | | | |
| **Knowledge assessment (maximumpoints: 100)** | | | | | |
| **Pre exam duties** | | **Points (50)** | **Final exam** | | **Points(50)** |
| Activities during lectures | | 15 | Oral exam | | 50 |
| Practical study | | 15 |  | |  |
| Seminars | | 20 |  | |  |

**Table 5.1** Course Specification for doctoral studies program

|  |  |  |
| --- | --- | --- |
| **Course: *Evaluation and assessment in agriculture*** | | |
| **Course Code:** 3DAG1I12 | | |
| **Lecturer(s)**(surname, middle initial, name)**:** professor Nedeljko LJ. Tica, PhD | | |
| **Course status: Elective** | | |
| **ECTS: 10** | | |
| **Condition: none** | | |
| **Course aims:**  Introducing students to basic scientific assumptions and methods of assessment of all relevant categories of assets, liabilities and capital. | | |
| **Course outcome**  Upon the completion of the course, students will be trained for the convent formation evaluation reports for all categories of operating assets, liabilities and capital of companies or individual households. | | |
| **Course contents**   * Fundamentals of estimating the means of production * Methods of valuation of assets * Assessment of buildings * Evaluation of orchards * Evaluation of livestock * Assessment of working capital * Assessment of capital value * Yield value of capital * Net market value of equity * Liquidation value of capital   Research work   * Basic principles of assessment * Basic methods of assessment * Evaluation of the elements of production * Valuation * Yield value of capital * Methods for the assessment of company property * Methods forassessment of company obligations * Creation of reports on the capital assessment | | |
| **Recommended literature**   1. Weston, F., Copeland, T.: Managerial Finance, The Dryden Press, Orlando, 2006. 2. Brigham, E., Ehrhardt, M.: Financial Management, The Dryden Press, Orlando, 2005. 3. Marko, J., Jovanović, M. iTica, N.: Kalkulacijaupoljoprivredi, Poljoprivrednifakultet, NoviSad, 1998. 4. Andrić, J: „Troškoviikalkulacijeupoljoprivrednojproizvodnji“ PoljoprivrednifakultetBeograd, 1991. 5. Rodić, J.: «Poslovnefinansijeiprocenavrednostipreduzeća», Ekonomika, Beograd, 1991. | | |
| Number of teaching hours | Lectures:30 | Student research work:90 |
| **Teaching strategies:** Teaching is performed through conventional methods and seminar papers. | | |
| **Knowledge assessment (maximumpoints: 100)**  Activities duringlectures15 p, Presentationof projects 15 p, Seminar paper 40 p, Oral exam 30 p. | | |

**Table 5.1** Course Specification for doctoral studies program

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| --- | --- | --- |
| **Course: Organization of business systems** | | |
| **Course Code:** 3DAG1I13 | | |
| **Lecturer(s)**(surname, middle initial, name)**:** Bošnjak V. Danica | | |
| **Course status:** Elective | | |
| **ECTS:** 10 | | |
| **Condition:** | | |
| **Course aims:**  The main aim of the course is to introduce the basic principles and methods used in defining the formal and legal boundaries of business systems, as well as regulation of relationships between business systems and its environment. | | |
| **Course outcome**  Students who attend this course will be able to monitor and correct all of the relevant factors for the organization and management of a business system so that regardless of the changes that occur in the business system its effective functioning could be provided. | | |
| **Course contents**  - The subject of organizing the business system; The man in the organization;Organization of funds; Principles of organization of business systems; The operation of business systems;  Fundamentals of Organization Structure; Horizontal organizational structure; Vertical organizational structure; Structure of business systems; Elements of the organizational structure; Types of Organizational Structure; Forms of business organization system; The organizational forms in agriculture; Size of business systems in agriculture | | |
| **Recommended literature**   1. Daft, R. (2012): Organization Theory and Design, 11th Ed. Vanderbilt Univerzity, South –Western College Publising ISBN 978-1111221294 2. Babic, M. and Lukic, Z. (2009). Organization-Theory, structure, design and behavior. Faculty of Economics, Banja Luka 3. Dulanović, Ž., Jasko, O. (2008): Principles of organization of business systems, Faculty of Organizational Sciences, Belgrade 4. Gallos, J. (Ed) (2006): Organization Development: A Jossey-Bass Reader, Wiley 5. Petkovic, M. (2006): The organization of business systems, CID, Belgrade 6. Seifert, Z. (2006): The organization of business systems, Technical Faculty "Mihajlo Pupin"   Zrenjanin | | |
| Number of teaching hours  **2+6 (120)** | Lectures:30 | Student research work: 90 |
| **Teaching strategies**  Lectures with video projector, individual consultations, discussion groups | | |
| **Knowledge assessment (maximumpoints: 100)** | | |
| In class activities  **10 p,** Written exam  **40 p,** Seminar **30 p,** Published scientific paper  **10 p,** Oral exam **10** | | |

**Table 5.1** Course Specification for doctoral studies program

|  |  |  |
| --- | --- | --- |
| **Course: Economic of mechanization** | | |
| **Course Code:** 3DAG1I14 | | |
| **Lecturer(s):Potkonjak B. Svetlana** | | |
| **Course status: Elective** | | |
| **ECTS: 10** | | |
| **Condition:** | | |
| **Course aims:**  Introducing students with modern methods of calculation and management costs of exploitation (for tractors and other farm machinery and equipment).Using optimization methods and models in agricultural engineering. | | |
| **Course outcome**  Students will be trained to write scientific and technical papers in the field of agricultural mechanization. Students will also be trained to work on scientific research projects and studies in this field. | | |
| **Course contents**  The importance of studying the economics of agricultural mechanization. Cost planning and using of agricultural machinery (depreciation, maintenance, insurance,fuel and lubricants, wages). Making calculations for individual mechanized process .Economic feasibility of purchasing (methods and models).Optimization of composition (tractors and equipment) on a farm. Optimization of the machine lifetime.Economic problems of agricultural transport. | | |
| **Recommended literature**   1. AndrićJ. isar. (2005): Investicije, Poljoprivrednifakultet,Zemun. 2. AndrićJ.(2004): Troškoviikalkulacijeupoljoprivrednojproizvodnji, Poljoprivrednifakultet, Beograd, 3. Kay R. (2005):Farm management,IPP,Danville,Illinois. 4. Barry P. (2004): Financiall management in Agriculture,IPP,Naville,Illinois. 5. Urošević B.(2009):Operaciona istraživawa i kvantitativne metode investicija.Ekonomski fakultet,Beograd | | |
| Number of teaching hours  2+6 (120) | Lectures:  30 | Student research work:  90 |
| **Teaching strategies**  Introductory lectures. Studying the literature and discussion on the specified topics.Collecting data in praxis.Data processing and interpretation of results.Participation in scientific and professional meetings.Presentation of studies.Participation in lectures and exercises on academic and master studies. | | |
| **Knowledge assessment (maximumpoints: 100)**  written exam 30 points  project presentation 20 points  seminar 20 points  oral exam 30 points | | |
| Methods of knowledge assessment can be different: written exam, oral exam, project presentation, seminar etc. | | |

**Table 5.1** Course Specification for doctoral studies program

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| **Course: System Analysis & Modelling Methods** | | |
| **Course Code:** 3DAG1I15 | | |
| **Lecturer(s): Novković Đ. Nebojša** | | |
| **Course status: Elective** | | |
| **ECTS: 10** | | |
| **Condition: -** | | |
| **Course aims:**  Introduction to themethodsof systemanalysis andmodellingof macroand microeconomic systems. | | |
| **Course outcome**  Training for themacro andmicro economicmodelling andimplementationof scientificexperimentson modelsdesignatedby scientific methods | | |
| **Course contents**   * INTRODUCTION * DEFINITION ANDCLASSIFICATIONSYSTEM * System approach, * MODELLING * MACROSYSTEMANALYSISANDMODELLING * InternationalModelsof Agriculture * NationalAgricultureModels * Regional Modelsof Agriculture * MICROSYSTEMANALYSISANDMODELLING * Integratedoptimizationmodelfordevelopment * Modelsin cropand vegetable production * Modelsin orchardsand vineyards * Modelsin cattle production * Modelsof piglivestock production * Models inpoultry production * Modelsof motor pool * Case studiesof systemanalysis andmodelling. | | |
| **Recommended literature**   1. Novković, N., VesnaRodic, VukelicNataša(2008): Linear programming-examplesand assignments, practicum,Faculty of Agriculture, Novi Sad, p. 247 2. GligorovV., Kovacevic M., KJosifidis., Paunovic B., PBeljić., AKovacevic., St. GeorgeB., NNovković., IvanicV., Vuckovic S., Popovic D., Gorgeous Kovacevic-B., MedovićV., IKnezevic., Sokić, M., Milojevic T. (2010): Competitiveness ofVojvodinaCESS, Novi Sad242 pages. 3. Husemann, Ch., Novković, N., Vukelić, N (2012):TheModelofFarmManagementInformationSystem: ACase-Study of GermanDiversifiedFarm,DETUROPE, CentralEuropean Journal ofRegionalDevelopment andTourism, Volume 4, Issue1,p.76-90 4. Novković, N. (1990): Optimization ofagriculturalproduction based onmultiplecriteria optimality, Faculty of Agriculture, Novi Sad 5. Novković N.(2010): Possiblewaysofagriculturedevelopment intheRepublicofSerbia, Chapter in the monograph: "Agriculturein theprocessofadjustmenttotheCommonAgriculture Policy," Facultyof Agriculturalsciences, UniversityCyril&Metodius, Skopje,p.179-190 | | |
| Number of teaching hours  30 | Lectures:  2x15 = 30 | Student research work:  6x15 =90 |
| **Teaching strategies**  Case studies andexamplesof Agro-modellingand experimentationon models. | | |
| **Knowledge assessment (maximumpoints: 100)**  essay50;oralexam 50 | | |

**Table 5.1** Course Specification for doctoral studies program

|  |  |  |
| --- | --- | --- |
| **Course: *Extension and social change in agriculture and rural areas – sociological approach*** | | |
| **Course Code:** 3DAG1I16 | | |
| **Lecturer(s)**(surname, middle initial, name)**: Jankovic R. Dejan** | | |
| **Course status: Elective** | | |
| **ECTS: 100** | | |
| **Condition: none** | | |
| **Course aims:**  During this course, students will learn about the sociological approach to the problem of agricultural extension as a factor of rural and agricultural development, social change and modernization of agriculture and the problem of the diffusion of knowledge and technology as a prerequisite for social and technological development of agriculture and rural areas. The aim is to address the specific interaction of traditional knowledge and culture of work and life, and new technologies and social development which affect rural areas and agriculture. | | |
| **Course outcome**  Upon the completion of this course, the students will know the specific sociological approach to the mentioned issues, as well as the complexity and interdisciplinary nature of these issues. Students will know the specifics of communication in rural areas, different theoretical models for understanding the communication, perception, learning and education. Students will be able to critically analysethe extension/advisory process and the factors that affect it. | | |
| **Course contents**  Sociology of agriculture and rural areas: modernization of agriculture and society; Extension science: from multidisciplinary to interdisciplinary concept; specific sociological standpoint to an agricultural extension as a factor of agricultural development; Objectives and functions of agricultural extension; social determinism, network relationships and advisory process; Extension and social, human, economic, environmental and other types of capital; transfer of technology and agricultural extension service; innovation and diffusion of innovations; centralized and decentralized advisory systems, Agricultural Knowledge and Information Systems; Knowledge and information - from local, traditional knowledge to “modern” knowledge and information systems: opportunities for interaction; Different models of extension organization and finance, transformation of extension/advisory systems; institutions and stakeholders in extension process;  Specific communication, perception and the defence mechanism in extension work; multiple realities and knowledge construction; Communication models and structures of meaning; models of behaviour change; communication for rural innovation; intervention and participation; social learning; negotiation; extension education; extension and research work, Methods of advisory work; mass media and extension communication; Ethical problems in extension work; planning, monitoring and evaluation of agricultural extension. | | |
| **Recommended literature**   1. Hoffmann, V., Gerster-Bentaya, M. Christink, A. and M. Lema (Ed.)(2009). Rural Extension. Basic concepts and issues. VOL: 1. MARGRAF PUBLISHERS 2. Hoffmann, V., M. Christink, A. and M. Lema (Ed.)(2009). Rural Extension. Examples and background material. VOL: 2. MARGRAF PUBLISHERS 3. Rogers, E. M., „Diffusion of Innovations“, Free Press, Fift Edition, New York, 2003. 4. Swanson, B.; Bentz, R.; Sofranko, A. (Ed.) (1998), „Improving Agricultural Extension - A Reference Manual“, FAO, Rome. 5. Leeuwis C, van den Ban, A, (2005) Communication for rural innovation: Rethinking agricultural extension. 6. JankovićD. (2005). Teorijadifuzijeinovacijainjendoprinosrazumevanjuinovativnogpotencijalasela*. ZbornikMaticesrpskezadruštvenenauke.*Br. 118-119, str. 225-256, NoviSad. ISSN 0352-5732 UDK: 316.334.55. 7. Van den Ban, A.W & H. S. Hawkins (1996). Agricultural Extension. Second Edition. Blackwell Sceince. 8. World Bank (2000), Beneficiary Assessment for Agricultural Extension, *The World Bank,*(SDV)   Articles of FAO, World Bank, OECD and others. Selected papers from Sociologia Ruralis, Journal of Rural Studies, Journal of Extension Education. | | |
| Number of teaching hours | Lectures:30 | Student research work:90 |
| **Teaching strategies:** Lectures, seminar papers, discussions, case studies, individual consultations | | |
| **Knowledge assessment (maximumpoints: 100)**  Lectures attendance: 20p. Active participation 10p. Seminar paper 50p. Oral exam 30p. | | |

**Table 5.1** Course Specification for doctoral studies program

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| **Course: *Investment calculations in the application of renewable energy*** | | |
| **Course Code:** 3DAG2I17 | | |
| **Lecturer(s)**(surname, middle initial, name)**:** VladislavN.Zekić | | |
| **Course status: Elective** | | |
| **ECTS:** | | |
| **Condition: none** | | |
| **Course aims:**  The goal of the course is to introduce the candidates with the scientific methods of investment evaluation with the focus on investing in renewable energy. | | |
| **Course outcome**  Bythe endof the coursethe candidateshouldbe ableto independentlyoras team memberswork on the analysisandpreparationof the programsfor investmentin the fields of agricultureandrenewable energy. | | |
| **Course contents**  Agriculture as aproducer and consumer ofenergy,renewable energy, the specificsof agricultureas energy producer, biomass, biogas, bioethanol, biodiesel. Investment calculations, types and economic significance; Fundamentals of assessment, assetvaluationmethods, projecting investment,calculation of the plannedproduction value,projectionsof production costs, projectingincomeinvestmentsand cash flows;Statical methodsfor assessing the efficiencyinvestments, Dynamicmethods for evaluatingthe efficiencyof investments;Sensitive analysis; Differentialcalculationsas a method ofinvestment appraisal. Method LCA.  Research work -Specificsof costsof certaintypes of energy sources -calculation of the plannedproduction value - implementation ofprojections -Analysis ofthe effectiveness andefficiency of investmentsin the use ofrenewable energy -Differentialcalculationsas a method ofinvestment appraisalof the use ofrenewable energy -Other methodsof investment evaluationin the use ofrenewable energy | | |
| **Recommended literature**   1. Zekić, V., Tica, N.: (2010). Ekonomskaopravdanostkorišćenjažetvenihostatakakaoizvoraenergije, Monografija, Poljoprivrednifakultet, NoviSad; 2. Ilić, M. isar: “EnergetskipotencijalikarakteristikeostatakabiomaseitehnologijezanjenupripremuienergetskoiskorišćenjeuSrbiji”, Studija, Institutzanuklearnenauke “Vinča”, 2002. 3. AndrićJ. isar: Investicije, Poljoprivrednifakultet, Beograd, 2005. 4. SubićJ.: Specifičnostiprocesainvestiranjaupoljoprivredu, Institutzaekonomikupoljoprivrede, Beograd, 2010. 5. Marko, J., Jovanović, M. iTica, N.: Kalkulacijaupoljoprivredi, Poljoprivrednifakultet, NoviSad, 1998. 6. Andrić, J: „Troškoviikalkulacijeupoljoprivrednojproizvodnji“ PoljoprivrednifakultetBeograd, 1991. | | |
| Number of teaching hours | Lectures:30 | Student research work:90 |
| **Teaching strategies:** Teaching is performed through conventional methods and seminar papers. | | |
| **Knowledge assessment (maximumpoints: 100)**  Activities duringlectures15 p, Presentationof projects 15 p, Seminar paper 40 p, Oral exam 30 p. | | |

**Table 5.1** Course Specification for doctoral studies program

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| --- | --- | --- |
| **Course: Operational research** | | |
| **Course Code:** 3DAG2I18 | | |
| **Lecturer(s)**: Nebojša, Đ. Novković | | |
| **Course status: Elective** | | |
| **ECTS: 10** | | |
| **Condition: -** | | |
| **Course aims:**  Introductionto quantitativemethodsand appliedresearch.Masteringof methods of operational researchandtheir application. | | |
| **Course outcome**  Trainingfor independent application of the methods for solvingmacroandmicroeconomicissues. | | |
| **Course contents**  -THEORYOF PRODUCTIONFUNCTIONS - Implementationof production functionsin agriculture -Network planning -Concept andcharacteristics of network  -The application ofnetwork planningin agriculture - Linear Programming -Stepsto buildingandsolvingmodels -LPClassicModel -Multicriteriallinear programming - TRANSPORTPROBLEM -Methods forsolvingtransportation problem -CASE STUDYOF APPLICATIONoperational research | | |
| **Recommended literature**   1. Rodic, Vesna(2001): A modelfor optimizing thedevelopmentof agricultureand food industry,Faculty of Agriculture, Novi Sad 2. Novković, N. (2003)Planning and designin agriculture- second,revised edition, Faculty of Agriculture, Novi Sad, 308 pages 3. Somogyi, W, Novkovic, N., Mladenovic, B. etc.. (1997): The application ofoperations researchinagriculture, PKBInformation Center, PadinskaSkela-Belgrade, p. 295 4. Husemann, Ch., Gardiner, N., Vukelic, N (2012):TheModelofFarmManagementInformationSystem: ACase-StudyofGermanDiversifiedFarm,DETUROPE, CentralEuropean Journal ofRegionalDevelopment andTourism, Volume 4, Issue1,p.76-90 | | |
| Number of teaching hours  30 | Lectures:  2 h 15 = 30 | Student research work:  6 h 15 = 90 |
| **Teaching strategies**  Case studies andexamplesof agro-modellingand applicationof operations research methods | | |
| **Knowledge assessment (maximumpoints: 100)**  essay50;oralexam 50 | | |

**Table 5.1** Course Specification for doctoral studies program

|  |  |  |
| --- | --- | --- |
| **Course: Social change in rural areas and agriculture** | | |
| **Course Code:** 3DAG2I19 | | |
| **Lecturer(s)**(surname, middle initial, name)**: Zivojin A. Petrovic** | | |
| **Course status: Elective** | | |
| **ECTS:** | | |
| **Condition: none** | | |
| **Course aims:**  During this course students will learn about the theoretical and methodological problems of research of local rural community changes and about development of local rural communities. The aim is to highlight the effects of global development processes and structural transformation, social groups and institutions of local rural communities, as well as the importance of local governance in development of rural communities. | | |
| **Course outcome**  Upon the completion of thecourse, the students will know thespecificsof local rural communitiescompared to urbansocialspace, understand itsstructure anddynamics of lifeand development,and will be able toaccess thecriticalissues of functioning of the local governance andits role in favour of community development. Studentswill understand thespecific cultural identityof local rural communitiesand will be able toexploretheminaccordancewith theprinciples ofsociologicalempiricalqualitative andquantitativeresearch. | | |
| **Course contents**  Defining the local community Theoretical and methodological problems of studying rural communities; *social viability* of local rural communities Changes and the development of rural communities (types of social change, global development processes of urbanization, industrialization, modernization, social processes reclamation, depopulation, ageing; quality of life in the local rural community) Social groups in rural communities (concept and typology of social groups, the importance of social groups for community life; character of social relations in local rural communities) The cultural identity of the local rural community The institutions of rural communities (the importance of local institutions; kinds and types of rural institutions) The organization of rural communities (the importance of local organization of rural collectives, social networks and networking in the local community) Local government (traditional and modern rural local governments, public and political participation of local people in the management process) The role and importance of local communities in rural development (the importance of local initiatives for rural development, institutional and organizational development of the rural carriers of local rural communities | | |
| **Recommended literature**   1. Bauman Zygmunt, (2006), *Community: seeking safety in an insecure world,* Malden Mass, Polity Pres, Cambrigde 2. Community development journal, Oxford University press (tematskibrojevi) 3. Zbornik LED (Local Economic Development), Otvoreniuniverzitet, Subotica, 2005 4. StojanovMladen, (2004), *Sociologijaseoskihkolektiva - ogledi*, Maticasrpska, NoviSad 5. Lutz Laschewski, Claudia Neu (Hrsg.) (2004) Sozialer Wandel in laendlichen Raeumen, Shaker Verlag, Achen. 6. Christa Müeller (1997), Von der lokalen Ökonomie zum globalisierten Dorf, Campus Verlag, Frankfurt 7. Theo Rauch ; Matthias Bartels ; Albert Engel (2001) Regional rural development : a regional response to rural poverty, Wiesbaden: Universum-Verl.-Anst. 8. Malcolm J. Moseley (Ed.) (2003) Local partnerships for rural development : the European experience, Wallingford : CABI Publ.   OdabraničlanciizčasopisaSociologijasela, Sociologia Ruralis, Journal of Rural Studies  Selected papers from journals Rural Sociology, Sociologia Ruralis, Journal of Rural Studies. | | |
| Number of teaching hours | Lectures:30 | Student research work:90 |
| **Teaching strategies:** Lectures, seminar papers, discussions, case studies, consultations | | |
| **Knowledge assessment (maximumpoints: 100)**  Lectures and exercise attendance: 20p. Active participation 10p. Seminar paper 40p. Oral exam 30p. | | |

**Table 5.1** Course Specification for doctoral studies program

|  |  |  |
| --- | --- | --- |
| **Course: Application of Expert Systems in Agribusiness** | | |
| **Course Code:** 3DAG2I20 | | |
| **Lecturer(s)**(surname, middle initial, name)**: Zoranovic S. Tihomir** | | |
| **Course status: Elective** | | |
| **ECTS: 10** | | |
| **Condition:** | | |
| **Course aims:**  Theoretical and practicalknowledgeabout the role, functioning, prerequisitesand benefitsof applying the methodsof decision making andexpert systems. Introduction to languagesof artificial intelligence andexpert systemshellanalysis. | | |
| **Course outcome**  Trainingfor understandingdecision-making processes, functioningexpert system andthe abilityto expandthe knowledge baseof expert system. The application ofthe methods adoptedintheagro-business systemsandin decision-making. | | |
| **Course contents**  *Theoretical study* Introduction, decision-making, optimization methods, languages of artificial intelligence​​, Lisp, Prolog, expert systemshells, knowledge base, analysisof the results. *Research work* Student throughtheirpracticalwork shouldanalyseexamplesof successful applicationof optimizationmethods, learn about thelanguages​​andartificial intelligenceapplications inbusiness systemsin agricultureandfood industryknowledge. | | |
| **Recommended literature**  1. R.D. Sriram, Intellegent Systems for Engineering: A Knowledge Based Approach, Springer Verlag, 1997  2. D.A. Waterman: A Guide to Expert Systems, Addison-Weslwy Publ. Co., Reading, MA, 1986  3. Stošić B., Menadžment inovacija - ekspertni sistemi, modeli, metodi, Fon, Beograd, 2007  4. Dr Leonid Stoimenov, Ekspertski sistemi, Fam, 2011  5. Internet sources | | |
| Number of teaching hours | Lectures: | Student research work: |
| **Teaching strategies**  Auditoryclassesina computer classroom,which isavailable for students. | | |
| **Knowledge assessment (maximumpoints: 100)**  Activities duringlectures 10 seminar60  oralexam 30 | | |
| Methods of knowledge assessment can be different: written exam, oral exam, project presentation, seminar etc. | | |
| \*Maximum size: 1 page A4 format | | |

**Table 5.1** Course Specification for doctoral studies program

|  |  |  |
| --- | --- | --- |
| **Course: *Finance market and financing of agriculture*** | | |
| **Course Code:** 3DAG2I21 | | |
| **Lecturer(s)**(surname, middle initial, name)**:** dr Nedeljko LJ. Tica | | |
| **Course status: Elective** | | |
| **ECTS:** | | |
| **Condition: none** | | |
| **Course aims:**  Thegoalof the courseisto introducethecandidateswiththe theory and practice of the highly complex categories of modern financial markets and the diverse system of financing in agriculture and the sector of agribusiness. | | |
| **Course outcome**  The candidates will be trained for further theoretical work in this field, on the financial market, in financial institutions and other regulatory financial institutions, ministries and local governments, cooperatives, agribusiness enterprises, etc. | | |
| **Course contents**  *Lectures:*Introduction to thetheory and practice offinance andfunding, structural changesin the financial servicesand currenttrendsin the banking industry; learning about the process ofassessment- concepts, standards, etc., examinationof the theoryand practiceof mergers andacquisitions, regulatory environment by regulations,institutionsand mechanisms oftheir action,development of the financialmarkets andorganizationsin the worldand financialmethods andcategories. *Research study*: introduction to the methodologyand techniques offinancial analysisthat areapplicableto banksinregard tocorporate business, especially in terms ofagribusinessenterprises. Introduction to themethods and techniquesofbusinesson the markets-futurestrading.Introduction to thetechniques ofcompany solvency assessment, strategic andoperational businessplanning andbusiness plans. Understanding thedifferent sourcesof financing, as well as themethodsand techniques that areusedin this process, financialrisk management,the roleand significance ofthe audit. | | |
| **Recommended literature**   1. Alexander C., (2005) Streetsmart Guide to Timing the Stock market: When to buy, Sell and Sell Short, McGraw-Hill Professional ISBN 0071461051 2. Erić, D.: Finansijskatržištaiinstrumenti, ČigojaŠtampa, Beograd, 2003. 3. Harwood A., (1999) Financial Markets and Development, The Crisis in Emerging Markets, ISBN 0815734972 4. Houthakker H., Williamson J.P., (1996) The Economics of Financial Markets, Oxford University Press US, ISBN 019504407X 5. HadžićM., (2007) Bankarstvo, Singidunum, Beograd 6. Madura, J.: Financial Markets and Institutions, ITP, Ohio, 2003. 7. Njegovan Z., TomićD. (1999) Financing the Agrobusiness Sector, EAAE, Beograd, 1 i 2 8. Krishnan S., (2000) Principles of Corporate Finance, Irwin McGraw-Hill | | |
| Number of teaching hours | Lectures:30 | Student research work:90 |
| **Teaching strategies:** Teaching is performed through conventional methods and seminar papers. | | |
| **Knowledge assessment (maximumpoints: 100)**  Activities duringlectures15 p, Presentationof projects 15 p, Seminar paper 40 p, Oral exam 30 p. | | |

**Table 5.1** Course Specification for doctoral studies program

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Course:** Methods of Environmental Management | | | | | |
| **Course Code:** 3DAG2I22 | | | | | |
| **Lecturer(s)**: Rodić O. Vesna | | | | | |
| **Course status:** Elective | | | | | |
| **ECTS:** 10 | | | | | |
| **Condition:** Requirements – knowledge of Environmental Management and Natural Resources (undergraduate studies) and Sustainable Environmental Management (postgraduate - Master's Studies) | | | | | |
| **Course aims:** The basic goal of this course is to provide fundamental knowledge about the problems in environment management, which largely come from the so-called market imperfection, i.e. improper valuation of environmental goods, as well as instruments and methods that could be used for solving these problems. | | | | | |
| **Course outcome:** Students attending this course will be able to think critically, to have a holistic approach to the interdependence of agriculture and the environment, to detect weaknesses of the market economy when the valuation of environmental goods is in question. They will be trained to use a range of research methods and will be able to carry out independent research addressing an environmental management topic in the field of agriculture. | | | | | |
| **Course contents:** Introduction; Concept of sustainable development; Intergenerational and intragenerational equity requirements for sustainability; Sustainability of agriculture; Importance, objectives and problems of valuation of environmental goods; Use of cost-benefit analysis for environmental management; Market imperfection for valuation of environmental goods; The principle of willingness to pay for the environmental good and willingness to accept compensation for its degradation; Use ​​and non-use values of environmental goods​​; Methods of revealed preferences (Defensive behaviour method, The hedonic price method, Travel cost method, Method of discrete choice); Methods of stated preferences (Contingent valuation method, and Choice experiment); Regulations, information, education, voluntarily based and market based methods for environmental management; Differences in approaches to sustainable development and environmental management, depending on the level of development. | | | | | |
| **Recommended literature:**  Zhang, Y. (2010): Comparison of the methods for environmental management, M&D Forum  Jonathan H. (2009): Economics of Environment and Natural Resources: contemporary approach, Datastatus, Beograd  Pearce, D., Atkinson, G., a Mourato, S. (2006): Cost-benefit analysis and the environment: Recent developments, OECD Publishing  Raybould, M. (2005): Attitudes and information effects in contingent valuation of natural resources, doctoral dissertation, Faculty of environmental sciences, Griffith University, Australia  Pretty, J. (2005): The Earthscan reader in sustainable agriculture, National Academic Presss, James and James  Callan, S., Thomas, J. (2004): Environmental economics and management: theory, policy and application, Thomson Larning  Gen, S. (2004): Meta-analysis of environmental valuation studies, doctoral dissertation, Georgia Institute of Technology, USA  Freeman, M. (2003): The measurement of environmental and resource values: Theory and methods, RFF press  Champ, A, Boyle, K, Brown, T (Ed.) (2003): A Primer on Non-Market Valuation, Kluwer Academic Publishers  Heinzerling, L., Ackerman, F. (2002): Pricing the priceless, Georgetown Environmental Law and Policy Institute  Vojnovic, I. (1995): Intergenerational and Intragenerational Equity Requirements for Sustainability, Environmental Conservation 22(3): 223-228. | | | | | |
| Number of teaching hours | | Lectures: 2 | | Student research work: 6 | |
| **Teaching strategies:** lectures, consultations, discussion groups, seminars, mentoring students | | | | | |
| **Knowledge assessment (maximum points: 100)** | | | | | |
| **Midterm** | **points** | | **Final exam** | |  |
| In class activities | Up to 10 | | Written exam | | 40 |
| Written assignment | Up to 30 | | Oral exam | | 10 |
| Published scholarly work | Up to 10 | |  | |  |
| Methods of knowledge assessment can be different: written exam, oral exam, project presentation, seminar etc. . | | | | | |
| \*Maximum size: 1 page A4 format | | | | | |

**Table 5.1** Course Specification for doctoral studies program

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Course:** Applied statistical methods | | | | | |
| **Course Code:** 3DAG2I23 | | | | | |
| **Lecturer(s)**: Bošković Olgica | | | | | |
| **Course status:** Elective | | | | | |
| **ECTS:** 10 | | | | | |
| **Condition: -** | | | | | |
| **Course aims:** The programme ofthiscourse enables doctoral students to use modern statistical methods in solving problems in the field of agriculture and related sciences. The students should gain an insight into the various uses of statistical procedures, as well as the ability to use statistical instruments and software. | | | | | |
| **Course outcome:** The doctoral students should be able to use statistical instruments and apply them adequately. The acquired skills can be used for successful solving of problems in their scientific research and further professional work. | | | | | |
| **Course contents:**  Theoretical study: empirical and theoretical distributions. Statistical inference. Variance analysis method. One-dimensional analysis of variance. Assumptions of the application of variance analysis. Model I, II and mixed model. Expected variance in completely random order. Homogeneity of variance tests. Transformations. Individual tests of differences between the means of treatments. Two-dimensional analysis of variance. Random block system and Latin square. Factorial experiments. Assumptions and components of variance in experiments with two and three factors. Split-plot. Experiments performed in several years and in different places. Experiments with perennial plants. Covariance analysis. Regression analysis. Simple linear regression. Multiple linear regression. Evaluation and testing of regression parameters. Correlation. Testing of coefficient of linear and multiple correlation. Coefficient of determination. Nonparametric tests. Using χ2 test. Rank correlation. Time series analysis.  Practical study: introduction to statistical software. The practical study is in accordance with the theoretical study through elaboration and illustration of adequate examples. | | | | | |
| **Recommended literature:**   1. Prem S. Mann, John Wiley & Sons, “Introduction to Statistics“,John Willey &Sons, INC, 2. ISBN 978-0-471-75530-2, CID – Centre for Publishing, Faculty of Economy, Beograd 3. Bošković, O., Dragutinović-Mitrović, R. (2009), The Basis of Statistical Analysis: Elements of time series analysis; reviewers: Dr Zorica Mladenović, Dr Ljiljana petrović, CID - Centre for Publishing, Faculty of Economy, Beograd, ISBN: 978-86-403-0981-3, COBISS.SR-ID 158547724 4. Montgomery,D.C. (1997), Design and Analysis of Experiments, John Wiley and Sons, New York 5. Glantz, S. A. (2002), Biostatistics, fifth edition, McGraw –Hill, New York   Journals: Biometrics, , Applied Statistics; Statistical programmes: STATISTICA,SPLUS,SPSS,MINITAB,GENSTAT. | | | | | |
| Number of teaching hours : 2+6 (120) | | Lectures: 2 | | Student research work: 6 | |
| **Teaching strategies:** lectures, consultations. | | | | | |
| **Knowledge assessment (maximum points: 100)** | | | | | |
| Pre-exam activities | **Points** | | **Final exam** | | **Points** |
| In class activities | 10 | | Written exam | | - |
| Activities during research | 10 | | Oral exam | | 30 |
| Seminar papers | 50 | |  | |  |
| Tests | - | |  | |  |
|  |  | | Total | | 100 |

**Table 5.1** Course Specification for doctoral studies program

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Course:** Economics of EU | | | | | |
| **Course Code:** 3DAG2I24 | | | | | |
| **Lecturer(s)**: Katarina M Djuric | | | | | |
| **Course status:** Elective | | | | | |
| **ECTS:** 10 | | | | | |
| **Condition: -** | | | | | |
| **Course aims:**  The aim of the course is to provide students with knowledge: the theory and practice of the EU economy as a supernational organisation, which –during more than half of the century – has had substantial impact on macroeconomic trends in all the areas and aspects of the global community. | | | | | |
| **Course outcome:**  The doctoral students should be acquainted with the philosophy, theory and practice of the economics and economic policies of the EU, particularly its achievements, in terms of improving the economic system, industrial policies, innovation, regional and rural development and agriculture. The students will be provided with special knowledge and skills, by increasing their capacities and becoming qualified to use their newly acquired knowledge about the EU and its economics. | | | | | |
| **Course contents:**  The origins and development of the EU, its macroeconomic policies, monetary union and fiscal policy, development policy and the creation and functioning of the EU institutions, enlargement and its most important development issues especially with regards to the global crisis. Also, special attention shall be given to studying of the policies of sustainable development, environmental policies (principles of environmental protection, the problems of measuring sustainable development); resource policy, labour market and labour, finance, financial management and politics, the policies of quality improvement, technological development, foreign policies etc.  For each teaching unit there are brief introductory theoretical lectures by professors and students followed by discussions with students’ participation. The course also includes presentation of seminar papers. | | | | | |
| **Recommended literature:**   1. Baldwin, R., Wyplosz,C.,( 2010) Economics of European Integration, Third Edition, Dataststus, Beograd. 2. Mirić, O. (2009) EU Regional Policy, GTZ, Austrian Development Cooperation, European movement, Beograd. 3. Artis, M., Nixon, F. (2001) The Economics of the European Union, Policy and Analysis, Third edition, Oxford University Press 4. Hitiris, T., (2003), European Union Economics, Fifth edition, Pearson Education. 5. Njegovan, Z. (2006) European Strategies and Policies in the Local Community, book, Centre for Democracy, Beograd 6. William, W., Wallace, H., Polac, M. (2005) Policy Making in the EU (The New EU Series), Oxford University Press, USA, 5 edition 7. Jackie Gower, J. (2002) The European Union Handbook (Regional Handbooks of Economic Developement Series), Routledge, 2 edition 8. Njegovan, Z., Pejanović, R., Bošković, O., (2007) The EU Lobbying System and the Perspective of its Institutionalization in the Republic of Serbia, University of Novi Sad, Faculty of Agriculture, Herceg Novi 9. Group of authors (2003) European integration of Serbia, Serbian Economists Association, Kopaonik 10. Group of authors (2001) The Yugoslav economy and the European Union - Challenges and Opportunities, 13-15, March, SEJ, Belgrade 11. Clini, C., Musu, I., Ludovica-Gullino, M. (2008): Sustainable Development and Environmental Management, Springe 12. Titenberg, T. (2006): Environmental and Natural Resource Economics, 7th Ed., Pearson, Addison Wesley | | | | | |
| Number of teaching hours : 2+6 (120) | | Lectures: 2 | | Student research work: 6 | |
| **Teaching strategies:** Theoretical and practical parts of the course will be done in the classroom, using slides and presentations with a video projector. | | | | | |
| **Knowledge assessment (maximum points: 100)** | | | | | |
| Pre-exam activities | **Points** | | **Final exam** | | **Points** |
| Activities during research | 10 | | Oral exam | | 30 |
| Course attendance | 10 | |  | |  |
| Seminar papers | 10 | |  | |  |
| Tests | 40 | | Total | | 100 |

**Table 5.1** Course Specification for doctoral studies program

|  |  |  |
| --- | --- | --- |
| **Course: Social change in rural areas and agriculture** | | |
| **Course Code:** 3DAG1I25 | | |
| **Lecturer(s)**(surname, middle initial, name)**: Jankovic R. Dejan** | | |
| **Course status: Elective** | | |
| **ECTS:** | | |
| **Condition: none** | | |
| **Course aims:**  Within this scientific area, students will deepen their knowledge about the sociological approach to rural development issues. Special attention will be devoted to understanding of the process of rural development planning, of rural development experiences in countries of post-socialist transformation, Serbia, as well as in developed countries. The goal is that students master the sociological concepts and categorical framework in the field of rural development, and to know how to use sociological way of thinking and methodologies for the analysis and research of specific problems of rural areas in Serbia. A particular goal is to learn from the experience of the EU countries, the experience of other "countries in transition" and to analyze possible solutions of medium-and long-term problems of (regional) rural development in Serbia. | | |
| **Course outcome**  Upon completion of the educational process, students know the sociological aspects of rural and agricultural development, are able to critically asses and analyze the specific models and rural development, planning processes, and to asses positive or negative effect of certain social changes in rural areas and in agriculture. Students are able to critically assess the development trends of rural areas and Serbian rural policy in comparison with the policies and measures applied in other countries. | | |
| **Course contents**  Rural areas: methodological problems of demarcation of rural and (non)rural, different approaches, the problem of typology of rural areas; case of Serbia Agricultural policy, rural policy, multifunctional agriculture, territorial rural development policy Endogenous and exogenous approaches to rural development: theoretical foundation of rural development policies. Regional rural development and social, economic, cultural, human, environmental and other types of capital and rural development; specifics of capital transformation for rural development. Rural development policies and development strategies; decentralization and rural development; governance; development of civil society and democracy; local / regional selfgovernment as a prerequisite for rural development. The importance and role of different social groups and institutions in rural development. Rural policy and rural development: the experience of other countries. Characteristics of post-socialistic transformation. Sociological aspects of agriculture as a factor of rural development, rural economy and the importance of its diversification; multifunctionality of agriculture and rural development; The sociological approach to the analysis and planning of rural development: levels of micro, mezzo and macro analysis and their association | | |
| **Recommended literature**   1. Цвејић, С., Бабовић, Марија, Петровић, Мина, Богданов, Наталија и Оливера, Вуковић (2010). Социјална искљученост у руралним областима Србије. УНДП. Београд. 2. Богданов, Наталија (2007). Мала рурална домаћинства у Србији и рурална непољопривредна економија. УНДП. 3. Ploeg, J. D. van der and T. Marsden (ed). *Unfolding webs*. Van Gorcum. Assen. 4. Ploeg, J. D. van der and G. van, Dijk (eds). Beyond modernization. Royal Van Gorcum. Assen 5. Ploeg**,** J.D. van der and Ann, Long (ed). Born from within. Practice and perspectives of endogenous rural development. Royal Van Gorcum. Assen 6. Mardsen, T. (2003). The condition of rural sustainability. Royal Van Gorcum. Assen 7. Woods, M. (2005). Rural Geography. Processes, Responses and Experiences in Rural Reconstructing. SAGE Publications. London. 8. Moseley, M. J. (2003). Rural development. Principles and Practice. SAGE Publications. 9. Cloke, P, Marsden, T. and P. H. Mooney (ed) (2006). Handbook of rural studies. SAGE Publications. London. 10. Long, Norman, (2001) Development Sociology – Actor Perspectives, Routlege. 11. Bryden, J. (2002). Rural Development Indicators and Diversity in the European Union. 12. Beetz, Stephan; Brauer, Kai; Neu, Claudia; [Hrsg.] (2004) Handwörterbuch zur ländlichen Gesellschaft in Deutschland,VS Verlag, Wiesbaden 13. Leeuwis C, van den Ban, A(2005), Communication for rural innovation: Rethinking agricultural extension. 14. Theo Rauch; Matthias Bartels; Albert Engel (2001) Regional rural development : a regional response to rural poverty,.   Selected papers from journals Rural Sociology, Sociologia Ruralis, Јournal of Rural Studies. | | |
| Number of teaching hours | Lectures:30 | Student research work:90 |
| **Teaching strategies:** Lectures, seminar work, discussions, case studies, consultations | | |
| **Knowledge assessment (maximumpoints: 100)**  Lectures attendance: 20p. Active participation 10p. Seminar paper 50p. Oral exam 30p. | | |

**Table 5.1** Course Specification for doctoral studies program

|  |  |  |
| --- | --- | --- |
| **Course: Macroeconomic Aspects of Technology Development of Agriculture** | | |
| **Course Code:** 3DAG3I26 | | |
| **Lecturer(s)**(surname, middle initial, name)**: Zoran M. Njegovan** | | |
| **Course status: Elective** | | |
| **ECTS: 10** | | |
| **Condition:** | | |
| **Course aims:**  The main goal is to provide the candidates with specific knowledge concerning Science and Technology development in agriculture as well the policies of Science and Technology development of developed countries as a base for creation and implementation of efficient Science and Technology development methods and models in less developed countries. The efforts will be placed mostly in the field of industry policies and transfer of technology. | | |
| **Course outcome**  The candidates will be educated and skilled to take part in industry policies creation, planning and implementation, to run science and technology development and create and implement different science and technology policies at the macro, industry and micro level. The acquired knowledge will be relevant for governmental institutions, educational institutions, agribusiness sector / enterprises as well private farms, etc. | | |
| **Course contents**  *Theoretical courses:* Definition of the topic, the global aspects of Sci and Tech development, innovations and transfer of technology, comparative analysis, methods of empirical research and measurement of Sci and Tech development., analysis of different Sci and Tech policies (EU, USA, less developed countries, etc.) specifics of agricultural and agribusiness Sci and Tech development, innovation, transfer and the actual level of development in different countries and regions. Methods and possibilities of Sci and Tech forecasting and planning. Special attention will be given to the science based development and the role of manpower in the process related to the agriculture.  *Researching and Study work of the candidates:* Analysis of all mentioned aspects of Science and Technology development in accordance with the preferences of the candidates, especially implementation of different methods concerning different topics. | | |
| **Recommended literature**  Vast and very rich literature and policies will be consulted. Some of the titles are:  **1. Auerswald, P., Schoening M. (2008) *Learning from the Future, Innovating in the Present*,** Belfer Center for Science and International Affaires, Harvard University, USA  2. FAO (2007) *The state of the world’s animal genetic resources for food and agriculture*, Commission on genetic resources for food and agriculture food and agriculture organization of the United Nations, Rome, Italy  3. MNTR (2002) PolitikanaučnotehnološkograzvojaSrbije, Beograd.  4. Stajano A., (2006) Research, Quality, Competitiveness, EU Technology policy for the information Society, Springer;  5. Mandal, Š., Carić, M.(2004) Upravljanjeistraživanjem, razvojemitransferomtehnologije, PrivrednaAkademija, NoviSad.  6. Christensen, M. C., Raynor, E. M. (2003) The Innovators Solution, Creating and Sustaining Successful Growth, Harward Business School Press.  7. Njegovan Z., (1992) MakroekonomskiaspektitehnološkograzvojapoljoprivredeJugoslavije, IEP, Beograd;  8. Schultz, W. T. (1964) Transforming Traditional Agriculture, Yale University Press  9.Rosenblum, W. J. (1993) World Agriculture in the Twenty-First Century, A Wiley-Interscience Publication, NY. | | |
| Number of teaching hours **2+6 (120)** | Lectures: 30 | Student research work: 90 |
| **Teaching strategies**  Lectures combined with group and individual research, consultations (direct and on-line), seminar papers, essays, presentations of individual and group work, project presentation, etc. | | |
| **Knowledge assessment (maximum points: 100)**  Individual and group work, seminar papers and essays up to 40 + 20 points, discussions and exam 40 points. | | |
| Methods of knowledge assessment can be different: written exam, oral exam, project presentation, seminar etc.) . | | |

**Table 5.1** Course Specification for doctoral studies program

|  |  |  |
| --- | --- | --- |
| **Course: Risk Management in Agriculture** | | |
| **Course Code:** 3DAG3I27 | | |
| **Lecturer: Todor Marković, PhD, assistant professor** | | |
| **Course status: Elective** | | |
| **ECTS: 10** | | |
| **Condition:** | | |
| **Course aims:**  Many decisions in agriculture and food industry have to be made under uncertainty. Risk, however, adds a considerable degree of complexity to the decision making process. This course presents the theoretical concepts of rational choice under uncertainty and develops the building blocks for risk management in agribusiness. Once the necessary statistical tools are reviewed, various indicators of the firm’s risk exposition are discussed, including quantitative methodsfor risk assessment. Moreover, the foundations of stochastic optimization are presented. | | |
| **Course outcome**  The theoretical part enables the students to understand the most important risk management tools, as insurance or weather derivatives (futures, options or swaps). Emphasis is placed on the numerical aspects of risk management. For example, students will be practically advised to use stochastic simulation or to price an option. | | |
| **Course contents**  Introduction to risk management (Meaningandmeasurementofrisk, Classification of risk sources, Components of a risk management system, Probability distributions and quantitative methodsfor risk assessment, Intuition vs. calculation);Approachto risk management(Phases of qualitative and quantitativerisk management, Riskefficiency line, Simulation, Individual riskadjustment); Measures to risk reducing(Diversification of reserves, Preliminary contractsand futures contracts, Insurance); Crop insurance (Theoretical and empirical analyses, Classification of crop insurance, Multi-risk crop insurance); Managementofbehaviouralrisks(Conflicts of interest, Information asymmetries, Images of people, Material/immaterial incentives, Displacement effects, Confidence); Early warning andearly detection(Management accounting, Liquidity forecast, Critical success factors, Weak signals, Scenario analysis); Special Aspects(Pitfalls in contracts, Business succession, Tax planningmeasures, Credit check, Personalrisks, Weather index insurance); Weather derivatives(Concept andtheoretical background, Types of derivatives, Weather contracts and Market of weatherderivatives, Delineation of weatherderivatives andtraditionalinsurance, Use of weatherderivativesin agriculture). | | |
| **Recommended literature**   1. Marković, T., Husemman, C.: Risk Management in Soybean Production with Weather Derivatives. Economics of Agriculture, ISBN 978-86-6269-018-0, 2012, 1513-1528 (Lecture Notice) 2. Marković, T.: Vremenski derivati kao finansijski instrument u osiguranju useva i plodova. Doktorska disertacija, 2010. (odabrana poglavlja) 3. Hirschauer, N., Mußhoff, O.: Risikomanagement in der Landwirtschaft. Agrimedia-Verlag, Clenze, 2012. 4. Mußhoff, O.: (Agricultural) Decision-Making under Uncertainty: Recent Developments and Applications. Habilitationsschrift, Humboldt-Universität zu Berlin, 2006. 5. Dorfman, M. S.: Introduction to Risk Management and Insurance (9th Edition). Prentice Hall, New Jersey, 2007. 6. Jewson, S., Brix, A.: Weather Derivative Valuation: The Meteorological, Statistical, Financial and Mathematical Foundations. Cambridge University Press, Cambridge, 2005. 7. Mußhoff, O., Hirschauer, N.: Bewertung komplexer Optionen - Umsetzung numerischer Verfahren mittels MS-EXCEL und Anwendungsmöglichkeiten der Optionspreistheorie auf Sachinvestitionen. PD-Verlag, Heidenau, 2003. 8. Prettenthaler, F., Strametz, Sandra, Töglhofer, C., Türk, A.: Anpassungs-strategien gegen Trockenheit - Bewertung ökonomisch-finanzieller versus technischer Ansätze des Risikomanagements, Wegener Center Verlag, Graz, 2006. 9. Rejda, G. E.: Principles of Risk Management and Insurance. Addison Wesley, New York, 2005. 10. Von Alten, Grace: Das Risikoverhalten von Landwirten – eine Studie am Beispiel der Erntemehrgefahrenversicherung. Cuvillier Verlag, Göttingen, 2008. 11. Weber, R., Kraus Teresa, Mußhoff, O., Odening, M., Rust, Insa: Risikomanagement mit indexbasierten Wetterversicherungen – Bedarfsgerechte Ausgestaltung und Zahlungsbereitschaft. In: Schriftenreihe der Rentenbank, Band 23, Frankfurt am Main, 2008. | | |
| Number of teaching hours | Lectures: 2 | Student research work: 6 |
| **Teaching strategies**  Lectures, seminars, PC-demonstrations, hands-on-exercises | | |
| **Knowledge assessment (maximum points: 100)**  Lecture presence **(20 points)** Oral exam **(50 points)**  Seminars **(30 points)** | | |

**Table 5.1** Course Specification for doctoral studies program

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Course:** Special Balances in Agrosector | | | | | |
| **Course Code:** 3DAG2I28 | | | | | |
| **Lecturer(s)**: Veljko Vukoje, PhD, Associate Professor | | | | | |
| **Course status:** Elective | | | | | |
| **ECTS:** 10 | | | | | |
| **Condition: -** | | | | | |
| **Course aims:**  Acquiring the theoretical and practical knowledge about creating, analysis and interpretation of different kinds of balances in the companies from the fields of agriculture and food industries, as well as the balances at the macro-level (region, province, country). | | | | | |
| **Course outcome:**  Through this course, students will develop their abilities to correctly make certain balances, select and make appropriate analysis, present results, provide evaluation and recommendations for improvements. | | | | | |
| **Course contents:**  Theoretical study  - The specifics of balancing in agriculture and food industry,  - Types and importance of the special balances in the sector of agriculture,  - The principles and policies balancing in the sector of agriculture,  - Analysis and review of financial statements in the sector of agriculture,  - Balancing and analysis of working capital in the sector of agriculture,  - Balancing in the sector of agriculture in developed countries,  - Macro balancing in agriculture and food industry,  - The macro analysis of financial results and financial position in the sector of agriculture,  - Other macro-analyses in the sector of agriculture.  Practical study  - Preparation of different balances in the agribusiness companies,  - Analysis of different balances in the sector of agriculture (making analytical reports, interpretation and presentation of acquired indicators)  - Introduction to the methodology of the macro-balance in in the sector of agriculture  - Analysis of macro-balances in the sector of agriculture. | | | | | |
| **Recommended literature:**   1. Duvnjak, K.: Financial Position and Problems of Financing Agriculture of the State Sector of, Beograd, 1989. 2. International Accounting Standards, the translation from English, Association of Accountants and Auditors of Serbia, Beograd, 2003. 3. International Financial Reporting Standards, translated from English, the Association of Accountants and Auditors of Serbia, Beograd, 2005. 4. Fridson, S.: Financial statement analysis, New York, 1991. 5. Ranković, J.:Enterprise Financial Management, Ekonomski fakultet, Beograd, 1999. 6. Rodić, J., Vukelić, Gordana: Theory and Analysis of Balance - chapters I 5-8, 6 II, III, IV, V, VI, Faculty of Agriculture, Beograd-Zemun, 2003. | | | | | |
| Number of teaching hours : 2+6 (120) | | Lectures: 30 | | Student research work: 90 | |
| **Teaching strategies:** Lectures with video projector. Active work through specific examples. Seminar papers. Professional visits business systems in the sector of agriculture and state institutions. | | | | | |
| **Knowledge assessment (maximum points: 100)** | | | | | |
| Pre-exam activities | **Points** | | **Final exam** | | **Points** |
| Activities during lectures | 10 | | Oral exam | | 30 |
| Activities during research | 10 | |  | |  |
| Seminar papers | 50 | |  | |  |
|  |  | | Total | | 100 |

**Table 5.1** Course Specification for doctoral studies program

|  |  |  |
| --- | --- | --- |
| **Course:** *Evaluation of investment projects in the agro-industry* | | |
| **Course Code:** 3DAG3I29 | | |
| **Lecturer(s)**(surname, middle initial, name)**:** Vladislav, N., Zekić | | |
| **Course status: Elective** | | |
| **ECTS:** | | |
| **Condition: none** | | |
| **Course aims:**  Providing the candidateswith the basicsof makingand controllingprojects and businessplans in the agro-industrial sector. | | |
| **Course outcome**  Candidateswill be ableto create and controlinvestment projects and businessplans in the agro-industrial sector. | | |
| **Course contents**  *Theoretical study*   * The specifics of agricultural production * Investing in agro-sector * Evaluation of investment in agriculture * The concept of the investment project * The content of the investment project * Preparation of investment project * The specific investment projects in the agro-sector * The concept of a business plan * The purpose and necessity of a business plan * The contents of a business plan * Creating a business plan * Specific business plans in the agro-industrial sector * Case studies of application of investment projects and business plans in agriculture (crop production, long-term crops, animal production, storage, primary processing and food processing, machinery, irrigation)   *Research work*  Making examples of projects and business plans  Evaluation of projects and business plans | | |
| **Recommended literature**   1. Novković, N. (2003): Planiranjeiprojektovanjeupoljoprivredi, Poljoprivrednifakultet, NoviSad, 2. AndrićJ. isaradnici : Investicije, Poljoprivrednifakultet, Beograd, 2005. 3. Andrić, J.: Troškoviikalkulacijeupoljoprivrednojproizvodnji, Savremenaadministracija, Beograd, 1998. 4. SubićJ.: Specifičnostiprocesainvestiranjaupoljoprivredu, Institutzaekonomikupoljoprivrede, Beograd, 2010. 5. JovanovićP. : Upravljanjeprojektom, Grafoslog, Beograd, 2002. 6. Shalman, W.A. (1997): How to Write a Great Business Plan, Harvard Business Review Jul/August 7. Hodgets, R.M., Kuratko, D.F. (1995): Effective Small Business Management, Dryden Press | | |
| Number of teaching hours  **2+6 (120)** | Lectures:30 | Student research work:90 |
| **Teaching strategies:** Teaching is performed through conventional methods and seminar papers. | | |
| **Knowledge assessment (maximumpoints: 100)**  Activities duringlectures15 p, Presentationof projects 15 p, Seminar paper 40 p, Oral exam 30 p. | | |

**Table 5.1** Course Specification for doctoral studies program

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Course:** Marketing of agricultural products | | | | | |
| **Course Code:** 3DAG2I30 | | | | | |
| **Lecturer(s)**: Vlahović, I., Branislav | | | | | |
| **Course status:** Elective | | | | | |
| **ECTS:** 10 | | | | | |
| **Condition: -** | | | | | |
| **Course aims:**  The aim of the course is to gain knowledge in the field of marketing of agricultural products. | | | | | |
| **Course outcome:**  Analysis of domestic and international markets, turnover and marketing of agro-industrial products. | | | | | |
| **Course contents:**  Theoretical study : the course consists of two parts   * general part   -Market: the concept of the market, types, size, segmentation and characteristics of the market of field and vegetable products. Elements of the market: supply and demand. Prices: changes (movement) of prices, cost types, parity price, price formation and regulation. Turnover of field and vegetable products: types of transactions, market institutions. Market research and marketing. Marketing concept and decision making in marketing. SWOT analysis. Instruments of the marketing mix: Product: the conceptual aspect of the product, the concept of product life cycle, the portfolio concept of products, packaging of products, EAN product labelling system. Price: factors that influence pricing, methods of assessment (formation) of prices. Promotion: business advertising, sales promotion, publicity, personal selling. Distribution: distribution channels, physical distribution, the width of the distribution.  - Special part:  The market of agro-industrial products. | | | | | |
| **Recommended literature:**  Vlahović, B.,: Marketing, Faculty of Agriculture, Novi Sad, 2004.  Vlahović, B.,: Market and marketing of agricultural and food products. Faculty of Agriculture, Novi Sad, 2011. | | | | | |
| Number of teaching hours : 2+6 (120) | | Lectures: 30 | | Student research work: 90 | |
| **Teaching strategies:**Interactive teaching with active participation of the candidates. Writing seminar papers. | | | | | |
| **Knowledge assessment (maximum points: 100)** | | | | | |
| Pre-exam activities | **Points** | | **Final exam** | | **Points** |
| Activities during lectures | Up to 30 | | Oral exam | | Up to 30 |
| Seminar paper | Up to 40 | |  | |  |
|  |  | | Total | | 100 |

**Table 5.1** Course Specification for doctoral studies program

|  |  |  |
| --- | --- | --- |
| **Course:** Entrepreneurial management in agribusiness | | |
| **Course Code:** 3DAG3I31 | | |
| **Lecturer(s)**(surname, middle initial, name**):**Milić B. Dušan, Lukač Bulatović Ž. Mirjana | | |
| **Course status: Elective** | | |
| **ECTS: 10** | | |
| **Condition:** | | |
| **Course aims:**Acquisition of knowledge, skills and techniques necessary to avoid the appearance of damping that arises in entrepreneur business environment, with the goal of achieving effectiveness and efficiency in business. ﻿With their innate and learned abilities, an entrepreneur will have to use all the chancescreated or imposed by the environment. | | |
| **Course outcome:** One of the major changes in the contemporary business world is manifested in the fact that businesses have to react much more quickly to numerous aspects of the events in the environment, but also within the company. ﻿This also means that entrepreneurs in agribusiness should introduce innovations very fast, and be as active as possible in order to retain their positions on the market. | | |
| **Course contents**  1.Entrepreneurship as a new development philosophy.  2.Agribusiness and multifunctional agriculture.  3.Innovation, entrepreneurship and technological discoveries. ﻿  4.The importance of agribusiness development.  5.Methods in agribusiness.  6. Factors in agribusiness: innovation process, the enterprise and the basic functions of business, organizational forms in turnover products, the life cycle of technology and environment.  7.Risk analysis-method of determining the level of risk.  8.Assessment of the risk of the investment project.  9.Financing the growth of entrepreneurial ventures.  10.Strategic management as a function of growth and development of entrepreneurship**.**  11.The development of entrepreneurship in large companies.  12.The concept of quality – quality and business goals, innovationprocess, decision making, process quality control and quality efficiency. ﻿ | | |
| **Recommended literature**  1. Elenov R., Dimitrievski D., Sredojević Zorica, Milić D.(2011): Agrobiznis, Univerzitet“ Sv. Kirili Metodij“, Fakultet za Zemjodelski nauki u hrana, Skopje.  2. Sredojević Zorica(2011): Troškovi bezbednosti i kvaliteta hrane, Poljoprivredni fakultet, Beograd.  3. Bobera D.(2010): Preduzetništvo, Ekonomski fakultet, Subotica.  4. James G. Beirlein, Keneth C. Schneeberger, Donald D. Osburn (2009) : Principles of agribusiness management, Waveland Press, INC, Fourth edition.  5. Radovanović Jasmina (2007): Vodić za inovativne preduzetnike, Konekta Konsalting, Novi Sad.  6. Milanović R.(2006): Mali biznis i preduzetništvo u poljoprivredi i selu, Institut za ekonomiku poljoprivrede, Beograd. | | |
| Number of teaching hours**2+6 (120)** | Lectures: 30 | Student research work: 90 |
| **Teaching strategies** 2x15=30 6  Oral. consultation, Power Point presentations | | |
| **Knowledge assessment (maximumpoints: 100)**  Seminar papers (1) 30 points  Presentation of project, production programme (1)70 points | | |
| Methods of knowledge assessment can be different: written exam, oral exam, project presentation, seminar etc. | | |

**Table 5.1** Course Specification for doctoral studies program

|  |  |  |
| --- | --- | --- |
| **Course: Management of water resources** | | |
| **Course Code:** 3DAG4И32 | | |
| **Lecturer(s):Potkonjak B. Svetlana** | | |
| **Course status:Elective** | | |
| **ECTS:10** | | |
| **Condition:** | | |
| **Course aims:**  Introduction to scientific research in the field of water resources management. Work on the development of new methods and models. Studying the possibilities of application of new theoretical achievement in related fields to water resources. | | |
| **Course outcome**  Training for writing scientific and technical papers in the field of water resourcesmanagement.Training for working on scientific research projects and studies in this field. | | |
| **Course contents**  -Economic aspects of water management (facilities /systems) for development,use and protection of water and waterflow;  - Management expenses of water facilities /systems;  -Models of management of water facilities /systems with case studies;  - Economic aspects of viable water resources management;  - Economic aspects of integrated water resources management. | | |
| **Recommended literature**   1. Bajčetić M. (2012):Integrativnost ekonomije u vodnom (javnom) sektoru. Prometej,Novi Sad. 2. Brouwer Roy,Pearce David (2009):Cost-Benefit Analysis and Water Resources Management.Edward Elgar Publishing;UK. 3. Bressers Hans (2010): Governance and Complexity in Water Management.Edward Elgar Publishing,UK. 4. Giupponi Carlo at all (2009): Sustainable Management of Water Resources.Edward Elgar Publishing,UK 5. Taylor Paul at all. (2009): Economics in Sustainable Water Management.EUWIBrisel. 6. Pashardes P. at. All (2012): Current Issues in the Economics of Water Resource Management.Springer,UK. 7. Meire P. at all. (2012): Integrated Water Management.Springer,UK. | | |
| Number of teaching hours  2+6 (120) | Lectures:  30 | Student research work:  90 |
| **Teaching strategies**  Introductory lectures.The study of literature and discussion on the specifiedtopics.Collecting data in praxis. Data processing and interpretation of results.Participation in scientific meetings. Presentation of the studies. Participation in lectures and exercises on academic and master studies. | | |
| **Knowledge assessment (maximumpoints: 100)**  Activity during lectures: up to 10  Exercises: up to 10  Work in international journal: up to15  Work in domestic journal: up to 10  Work on symposium: up to 15  Case presentation: up 10  Oral exam: to up 30 | | |
| Methods of knowledge assessment can be different: written exam, oral exam, project presentation, seminar etc. | | |

**Table 5.1** Course Specification for doctoral studies program

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Course:** The legal status of business entities in agribusiness | | | | | |
| **Course Code:** 3DAG2I33 | | | | | |
| **Lecturer(s)**:  **Veselinović P Janko** | | | | | |
| **Course status:** Elective | | | | | |
| **ECTS:** 10 | | | | | |
| **Condition: -** | | | | | |
| **Course aims:**  Introducing students to the basic features of business entities in the areas of agribusiness: types, methods of establishment, the specifics of individual companies from the point of view of agribusiness, the competence of business entities, activities, initial capital, mergers and termination methods. | | | | | |
| **Course outcome:**  Upon completion of the course, students will be able to adequately research and monitor special business entities operating in agribusiness, with the ability of decision-making related to the area. | | | | | |
| **Course contents:**  - The legal status of business entities in agribusiness.  - Types of business entities in agribusiness (companies, cooperatives, entrepreneurs, public companies)  - The special status of physical entities working in agribusiness (agricultural households and physical entities who provide service in agritourism)  -Legal position of individual companies (partnership, limited partnership, limited liability company, joint stock company)  - Rights, obligations and responsibilities of the organs of companies that can be organized within in the companies (the assembly, supervisory board, executive board, directors),  - The legal status of cooperatives (organs, power cooperative members, activities)  - An entrepreneur as a subject in agribusiness  - physical entities as subjects in agribusiness | | | | | |
| **Recommended literature:**   1. Doc dr. Janko P. Veselinović, PRIVREDNO PRAVO,Poljoprivredni fakultet, Novi Sad, 2011. 2. Zakon o privrednim društvima, Sl. glasnik RS, br. 36/2011 3. Zakon o zadrugama, Sl. list SRJ, br. 41/1996, sa izmenama (napomena: očekuje se donošenje novog savremenijog zakona tokom 2013.) 4. Zakon o stečaju, Sl. glasnik RS, br. 104/2009. | | | | | |
| Number of teaching hours : 2+6 (120) | | Lectures: 30 | | Student research work: 90 | |
| **Teaching strategies:**Lectures, writing seminar papers and contracts. | | | | | |
| **Knowledge assessment (maximum points: 100)** | | | | | |
| Pre-exam activities | **Points** | | **Final exam** | | **Points** |
| Activities during lectures | Up to 20 | | Oral exam | | Up to 30 |
| Seminar paper | Up to 50 | |  | |  |
|  |  | | Total | | 100 |

**Table 5.1** Course Specification for doctoral studies program

|  |  |  |
| --- | --- | --- |
| **Course:** Research methods in marketing | | |
| **Course Code:** 3DAG4И34 | | |
| **Lecturer(s):** Vlahović, I., Branislav | | |
| **Course status:**Elective | | |
| **ECTS:**6 | | |
| **Condition:** | | |
| **Course aims:**  The aim of the course is to gain knowledge in the field of research methods in marketing agricultural products. | | |
| **Course outcome:**  Analysis of domestic and international markets, turnover and marketing of agro-industrial products. | | |
| **Course contents:**  Market research and marketing. Marketing concept and decision making in marketing. SWOT analysis. Instruments of the marketing mix: Product: the conceptual aspect of the product, the concept of product life cycle, the portfolio concept of products, packaging of products, EAN product labelling system. Price: factors that influence pricing, methods of assessment (formation) of prices. Promotion: business advertising, sales promotion, publicity, personal selling. Distribution: distribution channels, physical distribution, the width of the distribution. | | |
| **Recommended literature:**  **Vlahović, B.,: Marketing, Faculty of Agriculture, Novi Sad, 2004.**  **Vlahović, B.,: Market and marketing of agricultural and food products. Faculty of Agriculture, Novi Sad, 2011.** | | |
| Number of teaching hours : 2+6 (120) | Lectures: 30 | Student research work: 90 |
| **Teaching strategies:**Interactive teaching with active participation of the candidates. Writing seminar papers. | | |
| **Knowledge assessment (maximum points: 100)**  Seminar paper - 50  Oral exam - 50 | | |