Study programme:	Doctoral academic studies		
Course title:	Pharmacokinetics and metabolism during drug development and drug use		
Teachers:	Miljković R. Branislava, Vezmar Kovačević D. Sandra, Vučićević M. Katarina		
Course status:	Elective		
Semester:	I	**Year of studies:**	I
ECTS points:	15	**Course code:**	
Requirements:	none		
Course aims:			
The aim of the course is to provide students with relevant tools needed for understanding the importance of the pharmacokinetics and drug metabolism during drug development, different designs of pharmacokinetic trials depending on the phase of drug development, importance of pharmacokinetic principles in drug therapy and individualization of dosage regimen taking into account pharmacokinetic variability.			
Course outcomes:			
On completion of the course, the student will be able to understand and apply drug's pharmacokinetic and metabolism characteristics into the decision-making process related to drug development and individualization of dosing regimen.			

Study programme:	Doctoral academic studies		
Course title:	Principles of modern pharmaceutical analysis		
Teachers:	Mira L. Zečević, Anđelija M. Malenović, Biljana M. Otašević, Ana D. Protić		
Course status:	Elective		
Semester:	I	**Year of studies:**	I
ECTS points:	15	**Course code:**	
Requirements:	**none**		
Course aims:			
Acquiring knowledge through research in the field of pharmaceutical analysis that is related to the evaluation of drug quality, starting from an active pharmaceutical ingredient to a pharmaceutical dosage form.			
Course outcomes:			
Implementation of scientific approach in development and application of appropriate analytical methods in quality control of active pharmaceutical ingredients and pharmaceutical dosage forms through all required tests.			

Study programme:	Doctoral academic studies		
Course title:	Microbiology 1		
Teachers:	Jelena A. Antić-Stanković, Marina T. Milenković		
Course status:	elective		
Semester:	I	**Year of studies:**	I
ECTS points:	15	**Course code:**	
Requirements:	**none**		
Course aims:			
The student acquires knowledge about morphological characteristics of bacterial cells, conditions which influence the growth of bacteria, mechanisms of bacterial pathogenesis, bacterial genetics, mechanism of action of antimicrobial agents and possibilities of use of microorganisms in pharmacy and medicine.			
Course outcomes:			

After attending a course, the student knows: factors necessary for growth of microorganisms in vitro, principles of rational antibiotic therapy, possibilities of application of microorganisms and / or their products in pharmacy and medicine.

Study programme:	Doctoral academic studies		
Course title:	General biochemistry and clinical correlations		
Teachers:	Topić S. Aleksandra, Bogavac-Stanojević B. Nataša, Kotur-Stevuljević M. Jelena, Zeljković R. Aleksandra, Stefanović Ž. Aleksandra, Vekić Z. Jelena, Ninić R. Ana, Sopić D Miron, Mirković S. Duško		
Course status:	Elective		
Semester:	I	**Year of studies:**	I
ECTS points:	15	**Course code:**	
Requirements:	**Biology, Organic chemistry, one-semester course of General biochemistry for undergraduate studies**		

Course aims:

Knowledge of the basic structure of biomolecules and cell signaling pathways; understanding of basic metabolic processes in a healthy organisms, in some special physiological conditions and under conditions of disturbed homeostasis. To obtain knowledge on basic mechanisms of gene activity regulation and the fow of genetic information from DNA through RNA to primary protein structure.

Course outcomes:

After completition of this course, the student will be able to continue following the courses related to disorders of metabolism in different pathophysiological conditions.

Study programme:	Doctoral academic studies		
Course title:	Selecter chapters of pharmacognosy		
Teachers:	Silvana D. Petrović, Zoran A. Maksimović, Tatjana D. Kundaković, Milica M. Drobac, Mirjana D. Marčetić		
Course status:	Elective		
Semester:	I	**Year of studies:**	I
ECTS points:	15	**Course code:**	
Requirements:	Passed subject Pharmacognosy (Integrated Academic Studies - study program Pharmacy)		

Course aims:

Training for the selection of subjects and methods of research that will enable the examination of the medicinal potential of new or under-studied plant material and pharmacognosistic characterization of herbal drugs (morpho-anatomical, chemical, pharmacological / utilization characteristics, standardization and quality control).

Course outcomes:

The student is able to choose the appropriate subject of research, as well as the appropriate methods, carry out research, critically examine the results and define the pharmacognosis potential of a new or under-studied herbal drug and perform its partial or complete pharmacognosistic characterization.

Study programme:	Doctoral Academic Studies		
Course title:	Chemical, biopharmaceutical aspects and computational methods in drug design		
Teachers:	Slavica M. Erić, Katarina M. Nikolić, Vladimir D. Dobričić, Slavica V. Oljačić		
Course status:	optional		
Semester:	I	**Year of studies:**	I
ECTS points:	15	**Course code:**	
Requirements:	**none**		

Course aims:

Advancing the knowledge about experimental and computer-aided methods for determination of physicochemical properties important for drug development. Advancing the knowledge about in vitro methods for estimation of skin permeability and retention, blood-brain barrier permeability and gastrointestinal absorption, which are most frequently used in the early stage of drug development. Advancing the knowledge about methods for quantitative structure permeability relationship (QSPR) and quantitative structure-retention relationship (QSRR) analyses. Advancing the knowledge about theoretical methods for molecular modelling, conformational analysis, calculation and selection of molecular descriptors, and pharmacophore mapping. Gaining the knowledge of various methods for Quantitative Structure-Activity Relationships (QSAR) modeling and virtual screening of chemical databases.

Course outcomes:

Knowledge of experimental and computer-aided methods for determination of physicochemical properties important for drug development. Knowledge of in vitro methods for estimation of skin permeability and retention, blood-brain barrier permeability and gastrointestinal absorption, which are most frequently used in the early stage of drug development and knoweldge of methods for creation and validation of QSPR and QSRR models. Knowledge of theoretical methods and computational programs for QSAR modeling and validation; analysis of pharmacophores, virtual screening of chemical databases and rational design of drug candidates.
Knowledge of methods for analysis of pathophysiological role, structure, and function of drug targets.
Knowledge of computational methods for optimisation of drug tartget structure, simulation of drug-target interaction and rational design of drug candidates.

Study programme:	Doctoral academic studies		
Course title:	Cosmetic materials - active and functional ingredients		
Teachers:	Savić D. Snežana, Vasiljević D. Dragana,Đekić M. Ljiljana, Krajišnik R. Danina, Lukić Ž. Milica, Pantelić N. Ivana		
Course status:	elective course		
Semester:	I	**Year of studies:**	I
ECTS points:	15	**Course code:**	
Requirements:	**one-semester undergraduate course in Cosmetology**		

Course aims:

To introduce the candidate with different groups of cosmetic ingredients, along with their properties and functionality, application, efficacy and safety aspects.

Course outcomes:

The candidate knows properties of various cosmetic products, their functionality, efficacy and safety aspects. Also, the candidate is able to independently make a selection of suitable cosmetic ingredients based on the assessment of their characteristics, according to the requirements set by the formulation process of a specific cosmetic product.

Study programme:	Doctoral academic studies		
Course title:	Mechanisms of Toxicity		
Teachers:	Antonijević M. Biljana, Đukić M. Mirjana, Marijana M. Ćurčić, Aleksandra A. Buha Đorđević, Zorica L. Bulat, Danijela D.Đukić – Ćosić		
Course status:	elective		
Semester:	I	**Year of studies:**	I
ECTS points:	15	**Course code:**	
Requirements:	**none**		

Course aims:

To gain, analyse, evaluate and interprete knowledge on the mechanisms of toxicity.

Course outcomes:

Gained knowledge on the mechanisms of toxicity.

Study programme:	Doctoral academic studies		
Course title:	Pharmacology of Pain		
Teachers:	Tomić A. Maja, Micov M. Ana		
Course status:	Elective		
Semester:	I	**Year of studies:**	I
ECTS points:	15	**Course code:**	
Requirements:	**none**		
Course aims:			
The aim of this course is to provide participants with: mechanisms involved in transmission and modulation of pain, classification of painful conditions and basic principles of their treatment, the most important classes of analgesics and their pharmacological properties, as well as with experimental approaches in studies of pain and potential analgesics.			
Course outcomes:			
Understanding of the cellular and molecular mechanisms of pain transmission/modulation, knowing of the most important classes of analgesics and their pharmacology, as well as the approaches used in pre-clinical studies of pain/analgesics.			
Study programme:	Doctoral academic studies		
Course title:	Pharmacy Practice		
Teachers:	Odalović M. Marina		
Course status:	elective		
Semester:	I	**Year of studies:**	I
ECTS points:	15	**Course code:**	
Requirements:	**none**		
Course aims:			
Acquiring knowledge in the field of pharmacy practice at all health care levels. Introduction to the taxonomy and epidemiology of pharmaceutical services/interventions. Introduction to quantitative and qualitative methods and tools for the pharmaceutical outcomes research of pharmacy practices/pharmaceutical services and interventions. Introduction and analysis of health information systems in digital technology era. The analysis of national drug policy and the system of reimbursement in terms of pharmacy practice.			
Course outcomes:			
Understanding and applying the knowledge of various types of pharmaceutical practice research. Students will be able to critically evaluate and analyze the methodological approaches of the published scientific articles, to suggest new innovative research tools for pharmacy practice research, and to evaluate medication use and carry out the evaluation of pharmaceutical services and new health technologies.			
Study programme:	Doctoral academic studies		
Course title:	Research and development of pharmaceutical dosage forms		
Teachers:	Jelena V. Parojčić, Svetlana R. Ibrić, Snežana D. Savić,Dragana D. Vasiljević, Ljiljana M. Đekić,Sandra V. Cvijić, Jelena D. Đuriš, Ivana R. Aleksić, Ivana N. Pantelić		
Course status:	Elective		
Semester:	I		I
ECTS points:	15	**Course code:**	
Requirements:	**none**		
Course aims:			
This course aims to introduce theoretical and practical aspects of preformulation studies to students, as well as to present various factors relevant for formulation development and biopharmaceutical properties of different pharmaceutical dosage forms.			
Course outcomes:			
Understanding and ability to independently evaluate preformulation and formulation factors relevant for development of pharmaceutical dosage form for different routes of administration. Knowledge and application of methods for characterization of active substances, excipients and dosage forms in independent research work.			
Study programme:	Doctoral academic studies		
Course title:	Food Chemistry and Safety		

Teachers:	Brižita R. Đorđević, Ivana D. Đuričić, Bojana B. Vidović,		
Course status:	elective		
Semester:	I	**Year of studies:**	I
ECTS points:	15	**Course code:**	
Requirements:	**none**		
Course aims:			
Acquiring knowledge in the field of food chemistry, knowledge of the chemical structure and function of macro and micro nutrients; Knowledge of the chemical structure and functions of non-nutritive food ingredients; Familiarization with the concepts of quality and health safety of food; Familiarization with the basic characteristics and methods of application of food additives, flavorings and enzymatic preparations; Information about characteristics of food contaminants; Familiarization with parameters of safety of drinking water; Knowledge of basic concepts in the field of general use products.			
Course outcomes:			
Independent assessment of the nutritional and biological value of foods and potential place in optimal nutrition; Knowledge of the quality of drinking water and potential place in optimal nutrition. Upon completion of the course, the student will be able to: provide information on the quality and safety of foodstuffs; Provide information on food additives and contaminants of food and drinking water, to know the basic risks of the use of additives and the risks of the presence of residues of contaminants; be able to carry out basic chemical analyzes in the area of control of additives and drinking water.			
Study programme:	Doctoral academic studies		
Course title:	Selected chapters of clinical pharmacy		
Teachers:	Miljković R. Branislava, Vezmar Kovačević D. Sandra, Vučićević M. Katarina		
Course status:	Elective		
Semester:	II	**Year of studies:**	I
ECTS points:	15	**Course code:**	
Requirements:	none		
Course aims:			
The aim of the course is to provide students with relevant tools needed for understanding drug-related problems of patients with various diseases and specific needs as well as drug-related problems of specific patient populations. Student will acquire knowledge about identification and drug-related problem solving in practice as well as monitoring of patient outcomes.			
Course outcomes:			
On completion of the course, the student will be able to apply the knowledge, identify and solve drug-related problems of patients in practice and monitor patient outcomes.			
Study programme:	Doctoral academic studies		
Course title:	Strategy of method development and chemometrical approach in pharmaceutical analysis		
Teachers:	Mira L. Zečević, Anđelija M. Malenović, Biljana M. Otašević, Ana D. Protić		
Course status:	Elective		
Semester:	II	**Year of studies:**	I
ECTS points:	15	**Course code:**	
Requirements:	**none**		
Course aims:			
Acquiring the necessary knowledge in the field of chemometry that are applied in development of different methods for drug analysis.			
Course outcomes:			
Successful application of the acquired knowledge in defining scientific problems, assessing the critical stages of method development, as well as the ability to solve defined problems with an appropriate risk assessment. Interpretation of experimentally obtained results and process of gathering all results and making relevant conclusions in the most appropriate way.			
Study programme:	Doctoral academic studies		
Course title:	Microbiology 2		
Teachers:	Milenković T. Marina, Antić-Stanković A. Jelena		

Course status:	elective		
Semester:	II	**Year of studies:**	I
ECTS points:	15	**Course code:**	
Requirements:	**none**		
Course aims:			
The aim of this course is to provide knowledge about morphological and physiological characteristics of microorganisms that are used in medicine and pharmacy,characteristics of human viruses (classification, tropism, oncogenic potential, virus detection in laboratory conditions, antiviral drugs and antiviral vaccines); characteristics of parasitic protozoa, structure of antiparasitic drugs and mechanisms of their action; general properties, virulence and classification of pathogenic fungi.			
Course outcomes:			
By the end of this course participants will have knowledge about general properties of microorganisms that are used in medicine and pharmacy,characteristics of human viruses (classification, tropism, oncogenic potential, virus detection in laboratory conditions, antiviral drugs and antiviral vaccines); classification, and replication of parasitic protozoa, structure of antiparasitic drugs and mechanisms of their action; general properties, virulence and classification of pathogenic fungi.			
Study programme:	Doctoral academic studies		
Course title:	Medical biochemistry		
Teachers:	Topić S. Aleksandra,Bogavac-Stanojević B. Nataša, Kotur-Stevuljević M. Jelena, Zeljković R. Aleksandra, Stefanović Ž. Aleksandra, Vekić Z. Jelena, Ninić R. Ana, Sopić D. Miron, Mirković S. Duško		
Course status:	Elective		
Semester:	II	**Year of studies:**	I
ECTS points:	15	**Course code:**	
Requirements:	**General biochemistry with clinical correlations, Meneral biochemistry for undergraduate studies**		
Course aims:			
Study and analysis of biochemical changes in human diseases.			
Course outcomes:			
Undestanding of biochemical basis of human diseases, monitoring and formulation of experimental procedures for laboratory testing of diseases, assessment and interpretation of laboratory results.			
Study programme:	Doctoral academic studies		
Course title:	Plant isolates: preparation, characterization and potentials of use		
Teachers:	Silvana D. Petrović, Zoran A. Maksimović, Tatjana D. Kundaković, Milica M. Drobac, Mirjana D. Marčetić		
Course status:	Elective		
Semester:	II	**Year of studies:**	I
ECTS points:	15	**Course code:**	
Requirements:	**Selected chapters of pharmacognosy**		
Course aims:			
Introduction to modern methods of preparation of plant isolates, their characterization and potentials of use.			
Course outcomes:			
After completing the course, the student is able to prepare appropriate plant isolates, carry out their characterization, and assess the possibilities of their use.			
Study programme:	Doctoral academic studies		
Course title:	Mechanisms of degradation and biotransformation of biologically active compounds		
Teachers:	Vujić B. Zorica, Čudina A. Olivera, Brborić S. Jasmina, Ivković M. Branka		
Course status:	Elective, module: Pharmaceutical Chemistry		
Semester:	II	**Year of studies:**	I
ECTS points:	15	**Course code:**	
Requirements:	**none**		
Course aims:			

The aim of this course is to gain a knowledge about impurity profile from chemical and safety aspects and to improve a knowledge about drug biotransformation, importance and role of metabolism in drug development and chemical structure/biotransformation relationship.			
Course outcomes:			
Gained knowledge about mechanisms of degradation and in vitro instability in assessment of drug substance quality and safety. Application of knowledge about chemical aspects of biotransformation in drug design and estimation of metabolic conversion of parent drug to active metabolite/novel drug.			
Study programme:	Doctoral academic studies		
Course title:	Preformulation and formulation research of colloid systems for cosmetic use		
Teachers:	Savić D. Snežana, Vasiljević D. Dragana, Đekić M. Ljiljana,Krajišnik R. Danina, Lukić Ž. Milica, Pantelić N. Ivana		
Course status:	elective course		
Semester:	II	**Year of studies:**	I
ECTS points:	15	**Course code:**	
Requirements:	none		
Course aims:			
Knowledge and ability to independently consider preformulation and formulation factors relevant for the development of colloid systems for cosmetic use. Obtaining theoretical and practical knowledge that will enable the candidate to develop formulations and define preparation methods of colloid-type cosmetic products, for diverse applications.			
Course outcomes:			
The candidate is skilled to independently design and perform preformulation and formulation studies necessary for development of diverse colloid systems for cosmetic use, in line with the contemporary demands relating to the quality, safety and efficacy of cosmetic products. The candidate is confident in her/his ability to develop formulations, optimize preparation procedures and perform characterization methods appropriate for colloid systems for cosmetic use.			
Study programme:	Doctoral academic studies		
Course title:	Models and Methods in Toxicology		
Teachers:	Antonijević M. Biljana, Đukić M.Mirjana, Ćurčić M. Marijana, Buha Đorđević A. Aleksandra, Bulat L. Zorica, Đukić-Ćosić D. Danijela		
Course status:	Elective		
Semester:	2	**Year of studies:**	I
ECTS points:	15	**Course code:**	
Requirements:	none		
Course aims:			
To gain, applicate, analyse and evaluate knowledge and skills in the field of models and methods used in toxicology.			
Course outcomes:			
After the completion of the course the student should be able to choose and applicate appropriate models and methods in toxicology, as well to provide critical assessment and interpretation of the obtained results concerning the character and significance of the toxic effect.			
Study programme:	Doctoral academic studies		
Course title:	Psychopharmacology		
Teachers:	Savić D. Miroslav		
Course status:	Elective course 1		
Semester:	1	**Year of studies:**	I
ECTS points:	15	**Course code:**	
Requirements:	none		
Course aims:			
The aim of this course is to provide participants with: an integrated overview of contemporary knowledge on nervous system and possibilitites to pharmacologicaly modulate nerovus functions; knowledge on indications, contraindikcations, adverse effects and interactions, as well as therapeutic outcomes of drug administration in nervous system disorders.			

Course outcomes:			
By the end of this course participants will have gained a deeper understanding of the molecular and cellular underpinnings of pharmacological modulation of nervous functions. Moreover, they will become familiar with the techniques and methods used in investigation of drug actions on nervous functions and obtain skills to achieve good command of the elected techniques in the field of nervous system pharmacology.			
Study programme:	Doctoral academic studies		
Course title:	Social Pharmacy		
	Krajnović M. Dušanka, Marinković D. Valentina		
Course status:	elective 1		
Semester:	I	**Year of studies:**	1
ECTS points:	15	**Course code:**	
Requirements:	**none**		
Course aims:			
Introduction to basic principles of bihevioral apsects of pharmacy and social influences on pharmacy practice. Mastering the research methods of new public-health, social factors that influence the health or insidence of diseases, use of medicines and behaviours associeted with it.			
Course outcomes:			
Aplication of knowledge from social pharmacy and epidemilogy methods for research in social pharmacy.Capability of critical apprasel of data extracted from national and international data base about health and capability of kondacting knowledge, attitudes and beliefs study associeted with health and ilness. Critical appresal in relation to new public health and right to health.			
Study programme:	Doctoral academic studies		
Course title:	Advanced drug delivery systems		
Teachers:	Jelena V. Parojčić, Svetlana R. Ibrić, Snežana D. Savić, Vasiljević D. Dragana, Ljiljana M. Đekić, Sandra V. Cvijić, Jelena D. Đuriš, Ivana R. Aleksić, Ivana N. Pantelić		
Course status:	Elective		
Semester:	II		I
ECTS points:	15	**Course code:**	
Requirements:	**none**		
Course aims:			
This course aims to introduce students to various factors relevant for formulation development and biopharmaceutical properties of different drug carriers and advanced drug delivery systems.			
Study programme:	Doctoral academic studies		
Course title:	Dietetics		
Teachers:	Brizita R. Djordjevic, Bojana B. Vidovic, Ivana D Djuricic		
Course status:	Mandatory modules		
Semester:	II	**Year of studies:**	I
ECTS points:	15	**Course code:**	
Requirements:	**none**		
Course aims:			
This course aims to provide knowledge on nutrient intake and nutritional status assessment methods. Introduction to different tools needs for creating specific dietary regimens appropriate for the nutrition of different populations groups. Characteristics of diets throughout lifecycle, in health and disease, in different physiological states. Food with adapted composition to special dietary nrequirements. Food supplements. Study types used in assessment of diet quality, effects of diet on health and nutritive status.			
Course outcomes:			
By the end of this course, participants will be able to critically evaluate dietary needs and give advice on nutrition in well-being and disease conditions. Student will be able to give advice on rational use of dietetic products and food supplements. Student is able to criticall y review literature and apply tools in creating dietary interventions.			

Study programme:	Doctoral academic studies		
Course title:	Methodology in pharmacokinetic studies and pharmacometric approaches to data analysis		
Teachers:	Miljković R. Branislava, Vezmar Kovačević D. Sandra, Vučićević M. Katarina		
Course status:	elective		
Semester:	III	**Year of studies:**	II
ECTS points:	8	**Course code:**	
Requirements:	Pharmacokinetics and metabolism during drug development and drug use		
Course aims:			
The aim of the course is to provide students with relevant tools needed for understanding the methodological issues in pharmacokinetic and pharmacodynamic data analysis.			
Course outcomes:			
On completion of the course, the student will be able to assess and apply optimal approach pharmacokinetic and pharmacodynamic parameters calculation, and to use pharmacokinetic softwares for data modelling and simulation.			
Study programme:	Doctoral academic studies		
Course title:	Methodology in treatment outcomes, adherence, drug interactions and adverse drug reactions		
Teachers:	Miljković R. Branislava, Vezmar Kovačević D. Sandra, Vučićević M. Katarina		
Course status:	elective		
Semester:	III	**Year of studies:**	II
ECTS points:	8	**Course code:**	
Requirements:	Selected chapters of clinical pharmacy		
Course aims:			
The aim of the course is to enable students to acquire knowledgde about different methodological approaches of clinical pharmacy research, including investigation of adherence, drugs efficacy and safety, drug interactions and adverse drug effects.			
Course outcomes:			
On completion of the course, the student will be able to apply the knowledge and select appropriate methodology for planning and conducting clinical pharmacy research, regarding adherence, therapy efficacy and safety, drug interactions and adverse effects of drugs. Moreover, students will be able to perform critical appraisal of the research methodology in clinical pharmacy.			
Course contents:			
Study programme:	Doctoral academic studies		
Course title:	Quantitative structure property relationship in pharmaceutical analysis		
Teachers:	Мира Л. Зечевић, Анђелија М. Маленовић, Biljana M. Otašević, Ana D. Protić		
Course status:	Elective		
Semester:	III	**Year of studies:**	II
ECTS points:	8	**Course code:**	
Requirements:	**none**		
Course aims:			
Acquiring knowledge in the field of quantitative structure property relationship in different analytical systems and methodologies that are applied in pharmaceutical analysis.			
Course outcomes:			
Capability of independent interpretation of quantitative structure property relationship of analyzed substances in different analytical systems, as well as appropriate choice of pharmaceutical methods, presentation and evaluation of the obtained results.			
Study programme:	Doctoral academic studies		
Course title:	Selected chapters of pharmaceutical and biopharmaceutical analysis		
Teachers:	Мира Л. Зечевић,Анђелија М. Маленовић, Biljana M. Otašević, Ana D. Protić		
Course status:	Elective		
Semester:	III	**Year of studies:**	II

ECTS points:	8	**Course code:**	
Requirements:	**none**		
Course aims:			
Acquiring knowledge in the sample preparation of biological material for biopharmaceutical analysis and pharmaceutical methods that are applied in the analysis of specific drug groups.			
Course outcomes:			
Application of the acquired knowledge in the selection of the appropriate sampling approach and the method to be applied in the analysis of specific groups of drugs.			
Study programme:	Doctoral academic studies		
Course title:	Molecular mechanisms of antibacterial resistance		
Teachers:	Dragana D. Božić, Marina T. Milenković		
Course status:	Elective		
Semester:	3	**Year of studies:**	2
ECTS points:	8	**Course code:**	
Requirements:	**none**		
Course aims:			
The aim of this course is to provide knowledge about molecular mechanisms of antimicrobial resistance and clinically important multiresistant strains of microorganisms.			
Course outcomes:			
By the end of this course participants will have knowledge about molecular mechanisms of antimicrobial resistance and methods for their phenotypic and genotypic detection.			
Study programme:	Doctoral academic studies		
Course title:	Vaccines		
Teachers:	Jelena A. Antić Stanković, Brankica V. Filipić		
Course status:	Elective		
Semester:	3	**Year of studies:**	2
ECTS points:	8	**Course code:**	
Requirements:	**none**		
Course aims:			
The aim of this course is to provide knowledge about principles of active immunization and different types of vaccines.			
Course outcomes:			
By the end of this course participants will have knowledge about principles of active immunization and different types of vaccines.			
Study programme:	Doctoral academic studies		
Course title:	Modern Methods in Medical Biochemistry		
Teachers:	Kotur-Stevuljevic M. Jelena, Bogavac-Stanojevic B. Natasa, Aleksandra R. Zeljković, Aleksandra Ž. Stefanović, Jelena Z. Vekić, ана Р. Нинић, Мирковић С. Душко, Топић С. Александра, Сопић Д. Мирон		
Course status:	Elective course		
Semester:	III	**Year of studies:**	II
ECTS points:	8	**Course code:**	
Requirements:	**none**		
Course aims:			
Theoretical basis and practical skills so as practical implementation of modern and actual biochemical and molecular biology methods; aplication in different research area and analysis of the results			
Course outcomes:			

After completing the course students will be trained to:
- Select the appropriate method
- Have theoretical and practical basis of complex analytical methods which could be used in medical biochemistry
- Critically estimate possibilities and shortcomings of different methods
- Use basic terminology which is necesarry for data analysis

Study programme:	Doctoral academic studies		
Course title:	Biomarkers in clinical research		
Teachers:	Bogavac-Stanojević B. Nataša, Kotur-Stevuljević M. Jelena, Zeljković R. Aleksandra, Stefanović Ž. Aleksandra, Vekić Z. Jelena, Топић С. Александра, Нинић Р. Ана, Сопић Д. Мирон, Мирковић С. Душко		
Course status:	Elective		
Semester:	III	**Year of studies:**	II
ECTS points:	8	**Course code:**	
Requirements:	**none**		

Course aims:

The aim of this course is to provide to participants information of validation and application of biomarkers in various clinical research. Also, the aim is introduction to the standards of good clinical laboratory practice (GCLP).

Course outcomes:

Upon completion of this course, participants will understand the process of validation of biomarkers and their application in screening, diagnosis and therapeutic outcome. Also, students will be able to apply the principles of good clinical laboratory practice (GCLP) in their research.

Study programme:	Doctoral academic studies		
Course title:	Structural characterization and chemical properties of plant secondary metabolites		
Teachers:	Vladimir Savic, Милена Симић		
Course status:	Elective		
Semester:	III	**Year of studies:**	I
ECTS points:	8	**Course code:**	
Requirements:	none		

Course aims:

To acquire knowledge related to structure determination, chemical transformations and metabolic pathways leading to secondary metabolites.

Course outcomes:

Understanding of application of modern techniques (UV/Vis, NMR, IR and MS) in structural elucidation; understanding of chemical transformations involved in the formation of secondary metabolites and metabolic pathways leading to various classes of compounds

Study programme:	Doctoral academic studies		
Course title:	Valorization of ethnomedicinal use of plants		
Teachers:	Silvana D. Petrović, Zoran A. Maksimović, Tatjana D. Kundaković, Milica M. Drobac, Mirjana M. Marčetić, Danilo Lj. Stojanović		
Course status:	Elective		
Semester:	III	**Year of studies:**	II
ECTS points:	8	**Course code:**	
Requirements:	**none**		

Course aims:

Information on experience-based medicine, on the purpose and forms of application of plants in ethnomedicine, as well as on procedures and methods for assessing the efficacy, safety and validation of such application.

Course outcomes:

The student is able to acquire and analyze data on the application of selected plants in ethnomedicine. In addition, the student is trained to assess the rationale and safety of the use of a particular plant species in ethnomedicine, using modern methods of identification, chemical analysis and pharmacological screening and/or the literature data on chemical composition and pharmacological activity.

Study programme:	Doctoral academic studies

Course title:	Selected methodes of synthesis and structural analysis		
Teachers:	Savic M. Vladimir, Marković D. Bojan, Ivković M. Branka, Petković R. Miloš		
Course status:	elective		
Semester:	3	**Year of studies:**	2
ECTS points:	8	**Course code:**	
Requirements:	**none**		

Course aims:

To learn about strategies in drug design and development based on organic chemistry and synthetic routes applied in drug synthesis. Introduction to basic physicochemical parameters and methods used in the characterization of the solid state (amorphous, crystalline state, phase transitions, polymorphism, monocrystals).Knowledge improvement of applications of UV-visible spectrophotometry with special topics of derivative spectrophotometry (DS) and applications of IR spectroscopy in the studies of importance in pharmaceutical chemistry.Advancing the knowledge about spectroscopic methods as infrared spectrometry, near-
infrared spectrometry, nuclear magnetic resonance spectroscopy and mass spectrometry.

Course outcomes:

To learn about general principles of drug synthesis and methodologies used for the synthesis of various drug classes. General understanding of drug/biological active compounds synthesis in laboratory and industrial environment.It is expected that students expand additional knowledge about the methods of structural analysis used in the characterization of a solid state and application of appropriate methods, significant for the assessment of biopharmaceutical properties of drugs.Enhancement of knowledge on spectroscopic methods applications (UV-visible spectrophotometry and IR spectroscopy) of significance for pharmaceutical chemistry intended for investigations in stability studies, pharmaceutical purity, molecular interactions, determination of partition coefficients, inclusion complex formation and evaluation of bioactivation via monitoring in vitro processes, with special topic of IR spectroscopy applications for investigations of polymorphism and polymers.Knowledge of spectroscopic methods and TLC-MS/LC-MS/LC-NMR techniques for structural characterisation and determination of drugs and related substances. Gaining knowledge about the application of spectroscopic methods in study of drug-target complexes and inclusion complexes of drugs with other
macromolecules.

Study programme:	Doctoral Academic Studies		
Course title:	Chemical and biological interactions of biomolecules in drug development		
Teachers:	Slavica M. Eric, Katarina M.Nikolic, Milkica A.Crevar-Sakač, Jelena S. Savić		
Course status:	optional		
Semester:	3	**Year of studies:**	2
ECTS points:	8	**Course code:**	
Requirements:	**none**		

Course aims:

Expanding knowledge about mechanism of chemical and biological interactions on molecular, cellular and biochemical level, for the purpose of drug development; gaining the knowledge about experimental and computational methods for investigation of the most important processes, such as cell cycle regulation, cell signal transduction, DNA translation, as well as other processes of interest. Expanding the knowledge about methods for drug development, that includes representation, visualisation and navigation of chemical-biological space, chemoinformatics and bioinformatics methods in investigation of multitarget relations between chemical structure and drug action, target-ligand modelling and molecular modelling; gaining the knowledge about mechanisms of transport of chemical agents into the cell; integration of chemical and biological intreactions with data from the literature, for the aim of application of all achievements in the development of new drugs;

Course outcomes:

Knowledge about mechanisms of chemical and biological interactions on molecular, cellular and biochemical level; knowledge about experimental and computational methods for investigation of the most important processes for development of new drugs; skills in application of new methods for drug development, visualisation, navigation of chemical-biological space; knowledge and skills for application of chemoinformatic and bioinformatic methods for study of multitarget relationships between structure and drug activity, target-ligand modelling and molecular modelling; knowledge about mechanism of transport of chemical agents in cells; skills in integration of old and new methodologies, as well as literature data in the field of chemical and biological interactions of complex biological systems, that would be further applied in drug development;

Study programme:	Doctoral Academic Studies
Course title:	In silico/in vitro/in vivo investigations of efficacy and safety in cosmetology
Teachers:	Savić D. Snežana, Vasiljević D. Dragana, Đekić M. Ljiljana, Krajišnik R. Danina, Lukić Ž. Milica, Pantelić N. Ivana

Course status:	elective course		
Semester:	III	**Year of studies:**	II
ECTS points:	8	**Course code:**	
Requirements:	**none**		
Course aims:			
To introduce the candidate to design, theoretical and practical aspects of in silico, in vitro and in vivo investigations of efficacy and safety of cosmetic materials and products for diverse applications, along with the selection of suitable statistical tests for analysis of the obtained results.			
Course outcomes:			
The candidate is capable to select and perform studies for efficacy and safety assessment of various cosmetic materials and products, followed by the application of proper statistical tests for analysis of the obtained results.			
Study programme:	Doctoral Academic Studies		
Course title:	Sensory assessment of cosmetic products with the applied statistics		
Teachers:	Savić D. Snežana, Vasiljević D. Dragana, Đekić M. Ljiljana, Krajišnik R. Danina, Lukić Ž. Milica, Pantelić N. Ivana		
Course status:	elective course		
Semester:	III	**Year of studies:**	II
ECTS points:	8	**Course code:**	
Requirements:	none		
Course aims:			
To introduce to candidate concept and characteristics of sensory attributes, types of sensory studies and tests used in sensory evaluation of various cosmetic products; together with the proper statistical tests necessary for the analysis of the obtained results.			
Course outcomes:			
The candidate is able to independently organize and perform sensory tests, as well as to evaluate the obtained results for various cosmetic products.			
Study programme:	Doctoral Academic Studies		
Course title:	Toxicology of Mixtures		
Teachers:	Antonijević M. Biljana, Đukić M. Mirjana, Bulat L. Zorica, Đukić-Ćosić D. Danijela, Ćurčić M. Marijana, Buha Đorđević A. Aleksandra		
Course status:	elective		
Semester:	III	**Year of studies:**	II
ECTS points:	8	**Course code:**	
Requirements:	**passed first year examinations**		
Course aims:			
To gain, analyse, evaluate and interprete knowledge on the toxicology of substance mixtures.			
Course outcomes:			
Gained knowledge on the toxicology of mixtures and its application.			
Study programme:	Doctoral Academic Studies		
Course title:	Chemical Carcinogens and Endocrine Disrupting Chemicals		
Teachers:	Antonijević M. Biljana, Đukić M. Mirjana, Bulat L. Zorica, Đukić-Ćosić D. Danijela, Ćurčić M. Marijana, Buha Đorđević A. Aleksandra		
Course status:	Elective		
Semester:	3	**Year of studies:**	II
ECTS points:	8	**Course code:**	

Requirements:	**passed first year examinations**		
Course aims:			
To gain, applicate, analyse and evaluate knowledge and skills in the field of endocrine disruptive chemicals and chemical carcinogenesis.			
Course outcomes:			
After the completion of the course the student should be able to: Locate and gather relevant data used for chemical hazard identification; Describe and explain mechanisms and potential toxic effects of endocrine disruptors; Explain methodologies to study the mechanisms and effects of endocrine disruptors; Discuss implications of endocrine disruption for human health; Identify and discuss challenges and complexities in identification, study and risk assessment of endocrine disruptors; Describe and explain mechanisms for chemical carcinogenesis; Explain experimental test models and epidemiological methods for carcinogen identifications; Identify and discuss challenges and complexities in carcinogen risk assessment; Evaluate and discuss scientific data used in cancer risk assessment.			
Study programme:	Doctoral academic studies		
Course title:	Experimental techniques in drug discovery		
Teachers:	Savić D. Miroslav, Novaković N. Aleksandra		
Course status:	Elective course		
Semester:	3	**Year of studies:**	II
ECTS points:	8	**Course code:**	
Requirements:	none		
Course aims:			
The aim of this course is to provide participants with an understanding of the principles of drug discovery and discovery, with an emphasis on techniques used in drug discovery.			
Course outcomes:			
By the end of this course participants will have gained a deeper understanding necessary for critical analysis of information sets connected with processes of drug discovery, with the final of goal of optimal assesment of relations between pharmaceutical quality, safety and efficacy of a novel drug. The cours participant will be familiar with contemporary strategies in novel drug research,			
Study programme:	Doctoral academic studies		
Course title:	Pharmacoepidemiology and pharmacoeconomics		
Teacher:	Lakić M. Dragana, Odalović M. Marina		
Course status:	electiive		
Semester:	III	**Year of studies:**	II
ECTS points:	8	**Course code:**	
Requirements:	**none**		
Course aims:			
Acquire knowledge in pharmacoepidemiology and pharmacoeconomics area. Acquiring competencies for critical evaluation of information and scientific publications in pharmacoepidemiology. Application of pharmacoeconomic methods. Mastering the pharmacoeconomic analysis. Application of modelling. Critical appraisal of new health technolgies.			
Course outcomes:			
Understanding and application of knowledge in pharmacoepidemiology and pharmacoeconomics. Critical evaluation of information from pharmacoepidemiology studies. Understanding and application of pharmacoeconomic methods and modelling. Critical appriasal of pharmacoeconomic problems from the different perspectives - third party payer, patient, health system.			
Study programme:	Doctoral academic studies		
Course title:	Molecular and cellular pharmacology		
Teachers:	Savić D. Miroslav		
Course status:	Elective course 1		
Semester:	3	**Year of studies:**	II
ECTS points:	8	**Course code:**	

Requirements:	none		
Course aims:			
The aim of this course is to provide participants with: an integrated overview of contemporary knowledge on molecular and cellular mechanisms that govern the actions of drugs			
Course outcomes:			
By the end of this course participants will have gained a deeper understanding of the molecular and cellular underpinnings of pharmacological modulation of human and animal organisms.			
Course contents:			
Study programme:	Doctoral academic studies		
Course title:	In silico - in vitro - in vivo methods for drugs/medicinal products characterization		
Teachers:	Parojčić V. Jelena, Ibrić R. Svetlana, Savić D. Snežana, Vasiljević D.Dragana, Đekić M. Ljiljana,Krajišnik R.Danina, Cvijić V. Sandra, Đuriš D. Jelena, Aleksić R. Ivana, Pantelić N. Ivana		
Course status:	Elective		
Semester:	III	**Year of studies:**	II
ECTS points:	8	**Course code:**	
Requirements:	**none**		
Course aims:			
The aim of this course is to introduce PhD students with theoretical aspects and practical application of the relevant in silico, in vitro and in vivo tools for drugs/medicinal products characterization.			
Course outcomes:			
Upon completion of this course, the students will get to know the procedures and will be able to identify the advantages and limitations of different in silico, in vitro and in vivo tools for drugs/medicinal products characterization. The students will be able to differentiate between various characterization methods, depending on the formulation development phase and aim of the study. The students will be skilled to perform different assays for drugs/medicinal products characterization within their PhD research, as well as in their future professional activities.			
Study programme:	Doctoral academic studies		
Course title:	Nanotechnology in development of carriers/innovative drugs		
Teachers:	Savić D. Snežana, Đekić M. Ljiljana, Krajišnik R. Danina, Ibrić R. Svetlana,Parojčić V. Jelena, Cvijić V. Sandra, Đuriš D. Jelena, Vasiljević D. Dragana, Aleksić R. Ivana, Pantelić N. Ivana		
Course status:	Elective course 3		
Semester:	3	**Year of studies:**	II
ECTS points:	8	**Course code:**	
Requirements:	none		
Course aims:			
Intoduction of the DAS students into key aspects and principles of nanotechnology application in the development of pharmaceutical products including nanopharmaceutics and nanotheranostics. Consideration of pharmaceutical excipients for the preparation / functionalization of nanoparticles and other nano-(bio)materials. Transfer of knowledge on design techniques and characterization methods of nanomaterials and nanocarriers, nanoencapsulation procedures, functional nanocarrier properties related with delivery of different drugs different drug therapeutic groups and for different routes of administration, including important achieved and prospective improvements in the efficacy and safety of pharmaceutical products.			
Course outcomes:			
The student knows and understands the principles on which nanopharmaceutics and nanotheranostics are based; knows the types and properties of the pharmaceutical excipients and (bio) materials used to derive / prepare and functionalize the nanocarreirs of the drug substances; possesses skills related with nanocarrier preparation and nanoencapsulation, characterization / testing, and consideration / execution of the conclusions about the physico-chemical properties of nanomaterials and nanocarriers and various in vitro and in vivo aspects that are important for the drug delivery efficacy and safety, especially in the case of the preclinical development of the innovative drugs.			
Study programme:	Doctoral academic studies		
Course title:	Biologically Active Food Compounds		
Teachers:	Brizita R. Djordjevic, Bojana B. Vidovic, Ivana D. Djuricic		

Course status:	Elective		
Semester:	III	**Year of studies:**	II
ECTS points:	8	**Course code:**	
Requirements:	**none**		
Course aims:			
This course aims to provide knowledge on the role of biologically active compounds in optimal nutrition. Introduction to the primary dietary sources and bioaccessibilities, tools of assessment intake and chemical analysis of certain biological active compounds, as well as monitoring their health effects.			
Course outcomes:			
By the end of this course, participants will be able to evaluate the biological value of food critically and apply the acquired knowledge in the assessment of dietary intake of biologically active compounds and their health effects.			
Study programme:	Doctoral academic studies		
Course title:	Food Analysis		
Teachers:	Brižita R. Đorđević, Ivana D. Đuričić, Bojana B. Vidović		
Course status:	elective subject		
Semester:	III	**Year of studies:**	II
ECTS points:	8	**Course code:**	D2O31
Requirements:	**none**		
Course aims:			
The aim of this course is to provide participants with basic techniques used in food analysis; qualitative and quantitative determination of biologically active nutritive and non-nutritive food ingredients; mastering the techniques necessary in the preparation of the doctoral dissertation.			
Course outcomes:			
Use of analytical techniques characteristic for food analytics and food ingredients; knowledge of the principles of analytical techniques.			
Course contents:			
Theoretical principles of analytical techniques applied in food analysis; basics of equipment verification; basics of validation of analytical methods.			
Recommended literature:			
Study programme:	Doctoral academic studies		
Course title:	Immunoregulation and immunomodulation		
Teachers:	Arsenović Ranin M. Nevena, Stojić-Vukanić M. Zorica		
Course status:	Elective		
Semester:	III	**Year of studies:**	II
ECTS points:	8	**Course code:**	
Requirements:			
Course aims:			
To provide students the latest knowledge on: i) cellular and molecular interactions in the protective and excessive or aberrant immune responses, and inflammation, ii) regulatory mechanisms invoved in these responses, and iii) mechanisms of action of immunomodulatory and anti-inflammatory agents.			
Course outcomes:			

A student who successfully accomplish the course is expected to: i) understand mechanisms underlying immune and inflammatory responses and ii) be able to identify the key "points" in the development of these responses, which are responsible for their diminished or increased efficiency. Additionally, such a student is expected to be capable of: i) undertaking research related to development of new strategies for prophylactic/active immunization against infectious diseases and therapy of immune/inflammatory diseases and ii) envisaging/understanding the possible immune effects of therapeutic agents whose activity is not primarily related to the effects on cells of immune system.

Study programme:	Doctoral academic studies		
Course title:	Molecular and Cellular Physiology		
Teachers:	Vesna R. Pešić, Marin M. Jukić		
Course status:	Elective		
Semester:	III	**Year of studies:**	II
ECTS points:	8	**Course code:**	
Requirements:	**none**		

Course aims:

Central role of physiogy in the era of advances in molecular biology and mapping of the human genome is to reveal physiological role of all coded proteins accross diverse cells and tissues. In order to achieve that the research involves multiple domains such as: molecular level, cellular level, tissutal leve, organ level, and the entire organism. Therefore, the main goal of this course is to provide the understanding of complex cascades of functioning and regulation of physiological processes at all these domains.

Course outcomes:

Besides the curriculum as such, the aim of this course is to develop scientific curiosity, critical and independent thinking, and problem solving capabilities within the field. Passing this course should mean that student knows and understands: (1) the structure and function of the plasma membrane, transportation through it and regulation of these processes, (2) the mechanism of action of hormones ie. hormon/receptor interaction, intracelular pathways, and receptor regulation, and (3) the mechanism of action of neurotransmitters ie. neurotransmitter/receptor interaction, intracelular pathways, and receptor regulation

Study programme:	Doctoral academic studies		
Course title:	Genomic instability research in *in vivo* and *in vitro* systems		
Teachers:	Biljana Potparević, Lada Živković		
Course status:	elective		
Semester:	III	**Year of studies:**	II
ECTS points:	8	**Course code:**	
Requirements:	**none**		

Course aims:

The aim of this course is to introduce participants with different levels of genomic instability; understanding of the appropriate research approach and application of methodology in *in vivo* and *in vitro* systems; training for analysis and understanding of the obtained research results.

Course outcomes:

Upon completing the course, candidates are expected to understand the importance of studying instability of the genome, to learn methodology of work and to practically apply the appropriate method in research work.

Study programme:	Doctoral academic studies		
Course title:	Statistics in research		
Teachers:	Bogavac-Stanojevic B. Natasa, Kotur-Stevuljevic M. Jelena		
Course status:	Mandatory		
Semester:	I	**Year of studies:**	I
ECTS points:	5	**Course code:**	
Requirements:	**One semester of undergraduate studies in mathematics and statistics pharmaceutical / medical biochemistry / medicine**		

Course aims:

Understanding advanced statistical methods. Applying advanced statistical analyses in scientific research.

Course outcomes:			
After completing the course students will be trained to: - Recognizing the type of statistical analysis - Interpret the significance of the obtained statistical indicators and discuss the results, - Understand the importance of the application of statistical methods in the scientific research, - Use statistical software in the data analysis.			
Study programme:	Doctoral Academic Studies		
Course title:	Communication and Presentation Skills		
Teachers:	Malenović M. Anđelija, Zeljković R. Aleksandra, Erić M. Slavica, Petrović D. Silvana, Maksimović A. Zoran, Đekić M. Ljiljana, Lukić Ž. Milica, Krajnović M. Dušanka , Vučićević M. Katarina, Vezmar Kovačević D. Sandra, Novaković N. Aleksandra, Tomić A. Maja, Vidović, B. Bojana, Božić D. Dragana,Antić Stanković A. Jelena, Buha Đorđević A. Aleksandra, Sopić D. Miron, Bulčat L. Zorica, Vasiljević D. Dragana		
Course status:	Mandatory		
Semester:	III	**Year of studies:**	II
ECTS points:	4	**Course code:**	
Requirements:	none		
Course aims:			
Acquiring knowledge and skills for oral and written presentation of scientific research work.			
Course outcomes:			
Following the exam, it is expected that the student can prepare an oral presentation of the results of the scientific research, as well as to write abstracts and scientific research papers.			
Study programme:	Doctoral Academic Studies		
Course title:	Preparation of project documentation		
Teachers:	Protić D. Ana, Otašević M. Biljana, Vekić Z. Jelena, Bogavac-Stanojević B. Nataša,Marković D. Bojan, Dobričić D. Vladimir, Maksimović A. Zoran, Krajišnik R. Danina, Pantelić N. Ivana, Savić D. Snežana, Lakić M. Dragana, Vučićević M. Katarina, Micov M. Ana, Đukić-Ćosić Danijela, Đuriš D. Jelena, Đukić M. Mirjana, Đorđević Brižita		
Course status:	Mandatory		
Semester:	IV	**Year of studies:**	II
ECTS points:	5	**Course code:**	
Requirements:	none		
Course aims:			
To acquire knowledge and skills for preparing project documentation for obtainig financial grants for scientific research.			
Course outcomes:			
Following the exam, it is expected that the student can prepare the project documentation for obtainig grants in scientific research.			
Study programme:	Doctoral Academic Studies		
Course title:	Health Systhem, Drug Policy and Public Health		
Teachers:	Marinković D. Valentina; Krajnović M. Dušanka		
Course status:	Elective		
Semester:	III	**Year of studies:**	II
ECTS points:	5	**Course code:**	
Requirements:	**none**		
Course aims:			
Acquiring knowledge on health systems branches, pharmaceutical administration, drug policy, law sciences and new public health phylosophy. Mastering the methods used in pharmaceutical and health system analysis as well as in public health.			

Course outcomes:			
Applying knowledge regarding health systems, pharmaceutical regulation and public health. Raising abilities of critical evaluation of regulatory data on public health, such as: availability, accessibility, quality, safety, efficacy and sustainability of pharmaceutical and health system.			
Study programme:	Doctoral Academic Studies		
Course title:	Literature review		
Teachers:	Malenović M. Anđelija,Zečević L. Mira,Ninić R. Ana, Topić S. Aleksandra, Crevar- Sakač Milkica, ČudinaA. Olivera, Petrović D. Silvana, Lukić Ž. Milica, Pantelić N. Ivana, Vučićević M. Katarina, Vezmar Kovačević D. Sandra, Đuričić D. Ivana, Đorđević R. Brižita, Filipić, V. Brankica, Milenković T. Marina, Cvijić V. Sandra, Aleksić R. Ivana, Antonijević M. Biljana, Ćurčić M. Marijana		
Course status:	Mandatory		
Semester:	II	**Year of studies:**	I
ECTS points:	10	**Course code:**	
Requirements:	none		
Course aims:			
Acquiring knowledge and skills related to literature review. Evaluation of the quality of published scientific research papers.			
Course outcomes:			
Following the exam, the student is expected to have the knowledge and skills for assessing the quality of a scientific research publication. It is also expected that the student has knowledge and skills for writing literature reviews.			
Study programme:	Doctoral academic studies		
Course title:	Methodology and ethics in scientific research		
Teachers:	Savić M. Miroslav, Krajnović M. Dušanka, Kotur-Stevuljević M. Jelena, Bogavac-Stanojević B. Nataša		
Course status:	Mandatory		
Semester:	I	**Year of studies:**	I
ECTS points:	10	**Course code:**	
Requirements:	**none**		
Course aims:			
The aim of this course is to provide participants with general scientific skills in order to formulate a scientific problem and plan the experiment, as well as to understand the complete process of preparation and publication of scientific research results. The aim of this course is to provide participants with the methodological principles and the ethical dimensions of scientific-research work. Students will acquire the basic knowledge in order to be able to formulate a scientific problem and to plan an experiment. Students will be also provided with the crucial ethical principles in conducting research as well as with the principles of integrity and the modern concepts of good scientific practice, together with the procedures related to publishing scientific results. They will be introduced to the ethical principles in biomedical researches, the principles related to the work with experimental animals, such as design studies, research methods. They will be introduced into the principles of breeding, handling and working with experimental animals, including the law regulation in Serbia, European Union and the rest of the world. The bases of anesthesia and surgery of experimetal animals will be presented.			
Course outcomes:			
By the end of this course participants will be able to summarize and apply the principles of the methodology of scientific-researh work and scientific writing. By the end of this course students will be able to understand the methodological principles of scientific-research work, to be familiarized with the ethical principles in biomedical research as well as to the law regulation principles on the cultivation, handling and working with experimental animals.			