

COURSE CATALOGUE



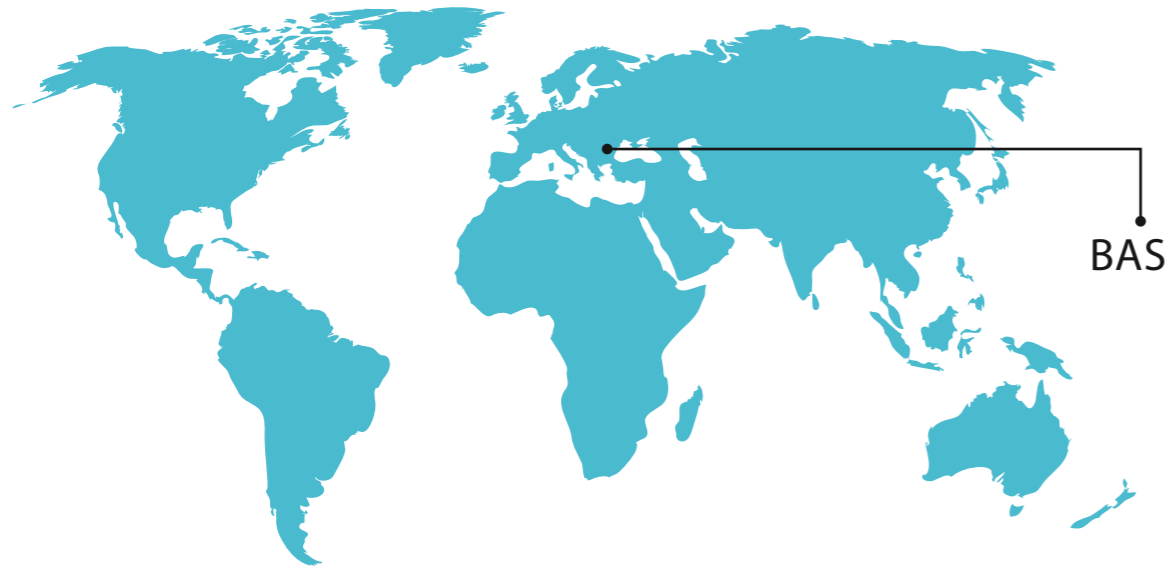
BULGARIAN ACADEMY OF SCIENCES

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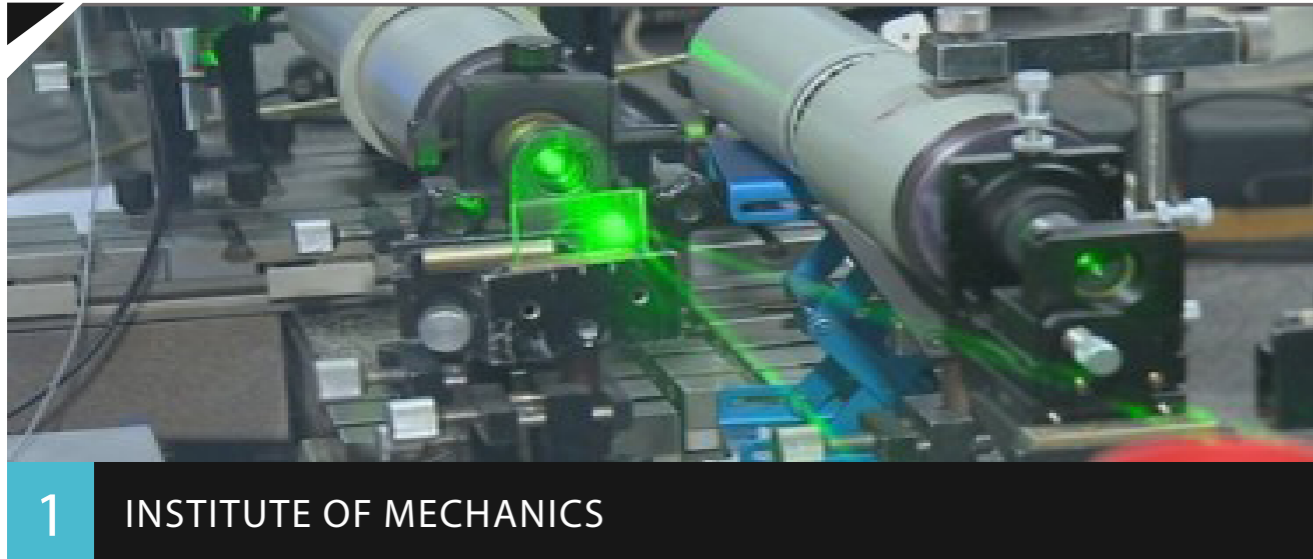
INTRODUCTION



The Bulgarian Academy of Sciences is a Higher Education Institution which trains third cycle (PhD/doctoral) students. Incoming PhD students may attend courses at any of the 42 units of the Academy (institutes/laboratories/scientific centres) as long as there is a group to begin the course, and they correspond to the student's subject area of study. The units of the Academy correspond to faculties/ departments of universities. They are:

1. INSTITUTE OF MECHANICS
2. INSTITUTE OF SYSTEM ENGINEERING AND ROBOTICS
3. INSTITUTE OF INFORMATION AND COMMUNICATION TECHNOLOGIES
4. INSTITUTE OF SOLID STATE PHYSICS
5. INSTITUTE OF ELECTRONICS
6. INSTITUTE FOR OPTICAL MATERIALS AND TECHNOLOGIES
7. INSTITUTE OF MINERALOGY AND CRYSTALLOGRAPHY

8. INSTITUTE OF METAL SCIENCE, EQUIPMENT AND TECHNOLOGIES
9. INSTITUTE OF GENERAL AND INORGANIC CHEMISTRY
10. INSTITUTE OF PHYSICAL CHEMISTRY
11. INSTITUTE FOR CATALYSIS
12. INSTITUTE FOR BIOPHYSICS AND BIOMEDICAL ENGINEERING
13. INSTITUTE FOR BIOLOGY AND IMMUNOLOGY OF REPRODUCTION
14. INSTITUTE FOR EXPERIMENTAL MORPHOLOGY, PATHOLOGY AND ANTHROPOLOGY WITH MUSEUM
15. INSTITUTE FOR BIODIVERSITY AND ECOSYSTEM RESEARCH
16. INSTITUTE FOR GEOLOGY
17. NATIONAL INSTITUTE FOR GEOPHYSICS, GEODESY AND GEOGRAPHY
18. INSTITUTE FOR BULGARIAN LANGUAGE
19. INSTITUTE FOR LITERATURE
20. INSTITUTE FOR BALKAN STUDIES WITH CENTER FOR THRACOLOGY
21. INSTITUTE FOR ETHNOLOGY AND FOLKLORE STUDIES WITH ETHNOGRAPHIC MUSEUM
22. SCIENTIFIC CENTER FOR CYRILLO-METHODIAN STUDIES
23. INSTITUTE FOR POPULATION AND HUMAN STUDIES



1 INSTITUTE OF MECHANICS

1.1.1. MECHANICS OF CARBON NANOSTRUCTURES AND BIOMEMBRANES

LECTURER

Assoc. Prof. Vassil M. Vassilev, Ph.D.
Тел. +359 2 979 64 78
E-mail: vasilvas@imbm.bas.bg

ACADEMIC HOURS

30

ECTS CREDITS

20 ECTS

This lecture course is an introduction to the continuum mechanics of carbon nanostructures and biomembranes. Despite of the different physical and chemical nature of these two types of nano-scale structures, it turns out that each such structure can be regarded as two-dimensional elastic continuum. This is because both of the foregoing structures are observed to exhibit elastic behaviour within a large scale, in continuum limit the geometry of the respective atomic or molecular lattices being two-dimensional even after a significant deformation due to external excitations.

The particular problems envisaged to be addressed in this course are: mechanics of two-dimensional elastic continuum whose mechanical behaviour depends on a few material constants; analytic description of cylindrical and axisymmetric equilibrium shapes of carbon nano-tubes and biomembranes subjected to hydrostatic pressure; equilibrium shapes of red blood cells; deformation of injected cells adhering to flat rigid substrates; junctions of carbon nano-tubes to graphene sheet or to other carbon nano-tubes.

1.1.2. BIORHEOLOGY, HEMORHEOLOGY AND HEMODYNAMICS

LECTURER

Prof. Dr. Nadia Antonova
Department: Biomechanics
Тел. +359 2 979 6413; 979 6421
E-mail: antonova@imbm.bas.bg

ACADEMIC HOURS

30

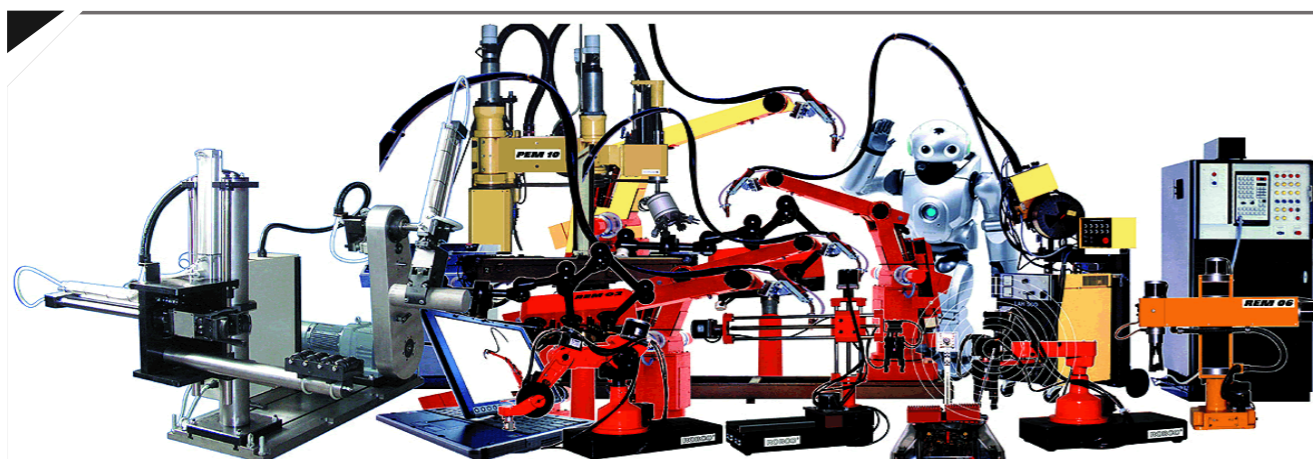
ECTS CREDITS

20 ECTS

The course aims to provide the subject, fundamentals, major problems and tasks of the modern development of Bio- and Hemorheology and Hemodynamics, theoretical and experimental, physical and mathematical methods, concepts models and analysis tasks for deformation under load and shear flow of biological materials and fluids, including and blood and its formed elements and the factors and processes that define them.

The course aims to provide contemporary knowledge and to emphasize the greatest discoveries in the field of Biorheology, Hemorheology and Hemodynamics. Ph D Students will acquire experience in conducting certain types of rheological experiments, analyze biorheological and hemorheological data through constitutive models and clarify the role of hemorheological disturbances for breaches of hemodynamics as well as epidemiology and prognosis in the study of various diseases. On the other hand, the course aims to motivate prospective graduate students to further research beyond what is known as the rheological aspects of aggregation of red blood cells, transmigration of white blood cells in tissues and activation of platelets in a shear flow as and challenges for the development of experimental techniques, theories, diagnostic tests and therapeutic procedures that contribute to elucidate the mechanisms of these disorders by improving the selection of therapeutic and preventive approach in patients with various diseases.

The course will be useful for PhD Students in the field of natural interdisciplinary oriented biological and medical sciences as well as to researchers who wish to acquire a more extensive background and to do fundamental research in the area of biorheology, hemorheology and hemodynamics.



2 INSTITUTE OF SYSTEM ENGINEERING AND ROBOTICS

1.2.1. FUNDAMENTALS OF PATENT LAW AND ABILITY TO INVENTED

Within this lecture course students are introduced to the basic principles and rules laid down in national and European patent law and law of copyright and related rights. Skills for formulating the criteria required for the presence of inventive solution. Clarified practical peculiarities of formation of patent applications in the format 1. devices or appliances, 2. methods and approaches and 3. combination method and device. Through concrete examples illustrate the variety of inventive tasks and ways of their solution.

LECTURER

Prof. DSci. Chavdar Roumenin,
Corresponding member of BAS

Assoc. Prof. Siya Lozanova, PhD

Department "Sensors, actuators and
control-measurement technology"

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slozanova@icsr.bas.bg

ACADEMIC HOURS

20 hours lectures

ECTS CREDITS

20 ECTS

The course will give a contemporary analysis of the psychological attitude and assumptions giving rise to innovation hypothesis, its maturation, the ability to apply the principles of the so-called «Horizon vision» and «brainstorming» and approbation of the final decision. Provide detailed information on the specifics of the inventive manner to assess the scientific results in order to use them to create inventions.

Upon request by the PhD students to prepare their inventive applications, provides advice and assistance from lecturers and staff of the Innovation Center.

1.2.2. HOW TO FORMULATE THE GOALS, OBJECTIVES, CONCLUSIONS AND CONTRIBUTIONS IN PHD THESISES AND SCIENTIFIC PAPERS

The course will explain the skills and techniques in shaping dissertations. Describe the specific ways of formulating objectives and resulting tasks in the thesis. Give examples of the most common mistakes and approaches to overcome them. Features in putting the contributions in dissertations and scientific publications. Typical mistakes and means for their removal. Public defense of the thesis as a unity of scientific competence and stage performance and learning techniques for acquisition. Speaker-audience dialogue and psychoanalysis feedback PhD-jury-audience. Features of oral reporting of scientific forums. Persuasion and verbal behavior. The duration of the exhibition - specificity and regularities.

LECTURER

Prof. DSci. Chavdar Roumenin,
Corresponding member of BAS

Department "Sensors, actuators and
control-measurement technology"

Tel. 873 78 22

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ACADEMIC HOURS

20

ECTS CREDITS

20 ECTS

1.2.3. MODELING AND CONTROL OF BIOTECHNOLOGICAL PROCESSES

The course is designed to prepare professionals and graduate students (engineers, technologists and biotechnologists) of specialties 02.21.08 «Automation of production (by industry)» 02:21:10 «Application of the principles and methods of cybernetics in various fields of science». The aim of the course is to introduce modern methods of modeling, monitoring and management of (bio) technological processes.

The course will trace all stages of the design of a modern system of direct digital control: building a database; creation of (bio) technological models and management models; structural and parametric identification of models; construction of linearising non-linear systems of objects and their application to the synthesis of adaptive control. Each of the stages will be illustrated with examples. Envisaged Laboratory use software package for identification and optimization developed using evolutionary algorithms. The laboratory exercises doctoral complement systematize and deepen the lectures.

LECTURER

Assoc. Prof. Maya Ignatova, PhD,
Assoc. Prof. Velislava Lyubenova, PhD

Department "Bioengineering"

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ACADEMIC HOURS

20 lectures and 10 hours labs

ECTS CREDITS

20 ECTS

1.2.4. IDENTIFICATION AND RECOGNITION OF ROBOTS AND MANIPULATORS

The aim of the course is to gain enough knowledge to analyze the necessary information for research and calibration of the site - mechatronic robotic system. To achieve the objective described the process of creating an adequate model reflecting the actual situation and the functions of the object. Made selection of suitable mathematical apparatus for description and study of the model.

The course will analyze the kinematic and dynamic characteristics of the segments of the mechatronic system, as is shown its structure. Also disclosed is a process of mechanical and mathematical modeling used to describe the regional structure of the handler being considered separately modeling processes of global and local kinematic systems. Addressed are issues of use of sensory information to the robot in order to identify its mechanical properties and its use in the process of calibration of the manipulator. Within mechatronic robotic system are shown possibilities to lead the process of identification of the mechanical structure and its recognition in the organization of optimal control in real time with preset certain restrictions.

The program is designed to train graduate students, specialists in the creation and testing of mechatronic systems, robots and manipulators.

LECTURER

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ACADEMIC HOURS

30

ECTS CREDITS

20 ECTS

1.2.5. PIEZO-DRIVE SMART STRUCTURES

The objective of the course is to introduce the basic applications, principles of operation and calculation of piezoadvzhvaniyata nano, micro and makropozitsionirane and their application in etc. smart structures

LECTURER

Assoc. Prof. Gentcho Stainov, PhD
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ACADEMIC HOURS

30 hours lecture, 15 hours lab

ECTS CREDITS

20 ECTS



3 INSTITUTE OF INFORMATION AND COMMUNICATION TECHNOLOGIES

1.3.1. GRID

The aim of the course is to acquaint the participants with the operating system GNU/Linux and the opportunities of the computational Grid for scientific computations and data storage. The access to the Grid infrastructure, which is based in our case on the operating system Linux and open source software, is free for academic use by Bulgarian scientists and students and offers up to 2000 CPUs and 200 TB of storage.

The computational Grids are used by applications from the domains of quantum chemistry, computational mechanics, geophysics, high-energy physics, ecology, financial mathematics and many others, when high amount of computational and storage capacity is required. The course includes introduction to the operating system Linux: installation, basic commands, installation of rpm packages, bash shell scripting. The procedures for installing additional software and then for compiling own codes will be considered. Access for execution of sequential and parallel jobs on a high performance cluster will be provided. The opportunities of Grid computing will be studied in the following sequence: obtaining access to the Grid, using the Grid for storage, execution of computational tasks, obtaining information about the Grid and problem resolution procedures. The accent is on the use of the Grid as users, rather than administrators and the participants will be testing their codes on the available Grid resources. After completing the course the participants should be able to start their own programs on Linux clusters and Grids and should have enough knowledge of the GNU/Linux OS in order to be able to manage their own workstations. The participants must have knowledge of at least one popular programming language, for example C, JAVA, Fortran. The course will include a course work.

LECTURER

Dr. Emanouil Iordanov Atanassov,
Assoc. Prof.
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ACADEMIC HOURS

30 hours lectures

ECTS CREDITS

20 ECTS

1.3.2. INTRODUCTION TO WIRELESS SENSOR NETWORKS

Wireless sensor networking is an emerging discipline with a wide range of applications in areas as environmental monitoring, health care applications, industrial process control, security and surveillance, smart home and many others. Wireless Sensor Networks (WSN) have been widely considered as one of the most important technologies, which will change radically the way we act.

The course goal is to provide a systematical introduction of the basic concepts and solutions in wireless sensor networking. It covers the most important networking WSN aspects, including network architecture design, medium access control, routing and data dissemination, node clustering, query processing and data aggregation, node localization, time synchronization, transport and quality of service, energy efficiency, network security, and sensor network standards.

This course is intended for a wide range of audience, including academic researchers, graduate/undergraduate and PhD students, practitioners in industry, and research engineers. It focuses on development of deep understanding of fundamental issues and development of practical skills working in a world-class Lab, equipped with needed software/hardware development tools. The training is based on a hands-on approach and involvement in design of real applications.

LECTURER

Associate Professor, Ph.D. Dimitar Vasilev Bogdanov

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ACADEMIC HOURS

32 lectures

ECTS CREDITS

20 ECTS

1.3.3. INTERNET TECHNOLOGIES FOR SYSTEM MANAGEMENT

This course is an introduction to network management, network operations and communication technologies. The information protocols, based on the TCP/IP protocol stack are under consideration. The different levels of functionalities, protocol parameters and architectures are studied. The course gives ground for system management in network environments, testing and diagnoses of network operations. Hierarchy of architectures, packets, cells are evaluated and learned.

LECTURER

Professor, D.Sc. Todor Atanasov Stoilov

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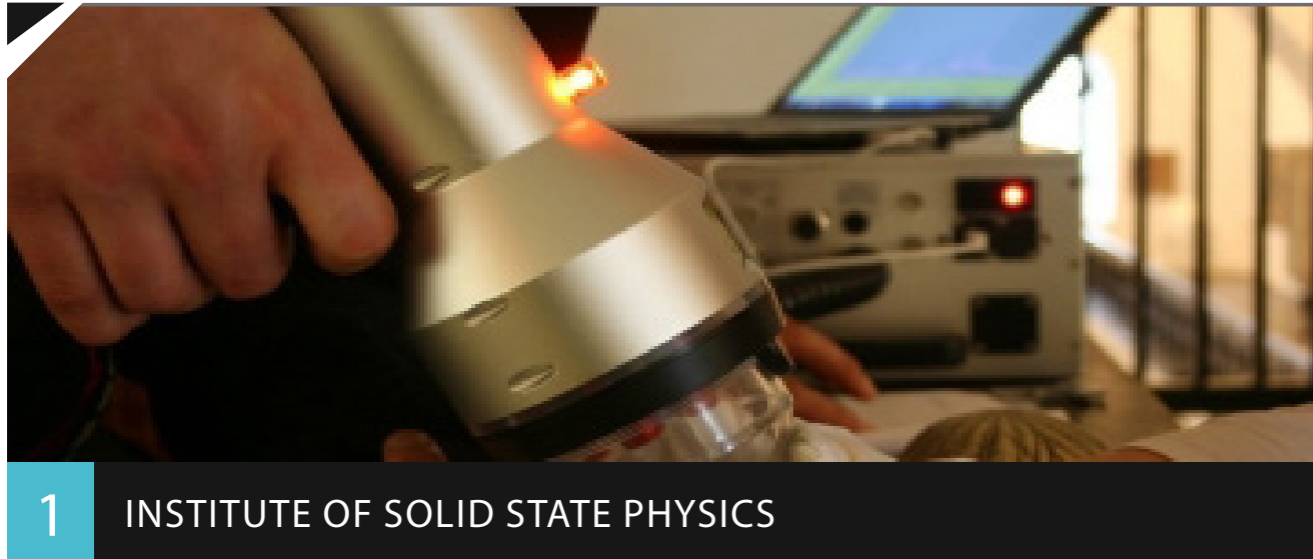
E-mail: todor@hsi.iccs.bas.bg

ACADEMIC HOURS

30

ECTS CREDITS

20 ECTS



1 INSTITUTE OF SOLID STATE PHYSICS

3.1.1. LIQUID CRYSTAL APPROACH IN THE LIVING MATTER PHYSICS

This course offers theoretical and experimental description of some of the most important technocrystal biostructures - biological membranes. The necessary information from the physics of liquid crystals is given during the course itself, respectively, consistent with the two-dimensional nature of objects. Discussed are sequentially mechanical, electrical and flexo-electrical membranes, the relevant material constants are derived from the molecular structure of the membranes. Experimental methods for studying these properties are considered. The idea of biomembranes as liquid crystal device with a number of generalized degrees of freedom, which interact through a system of forward and reverse effects is developed. Red vital functions are described by this general idea.

LECTURER

Prof. DSci. Chavdar Roumenin,
Academician Alexander G. Petrov,
PhD, DSc, FBAS

Director, Institute of Solid State
Physics"

Tel. +359 2 875 80 61

E-mail: r_director@issp.bas.bg

ACADEMIC HOURS

30 hours

ECTS CREDITS

20 ECTS

3.1.2. LOW TEMPERATURE PHYSICS AND TECHNOLOGY

This course is developed for PhD candidates using low-temperature test methods and provides additional knowledge to obtain cryogenic temperatures, the properties of liquefied gases, low temperature thermometers, safety when working with liquefied gases, etc.

LECTURER

Assoc. Prof. Vassil Lovchinov, PhD

"

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ACADEMIC HOURS

20 lectures and 10 hours lab

ECTS CREDITS

20 ECTS

3.1.3. LECTURES OF PHASE TRANSITIONS

Since 2000, this course is taught annually, the content varies according to the desire of the audience and the speaker. Presents the current status and current problems in the physics of phase transitions, mainly in theory and applications. The emphasis is on mastering the methods of the theory of phase transitions, which are universal in theoretical physics. The course is intended for PhD students of the Master Course and professionals interested in physics and other natural science disciplines. During the first lecture of the course, listeners will be able to propose a modification to the content of the lectures, in view of their specific needs of knowledge

LECTURER

Prof. Dimo I. Uzunov, PhD, DSc
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ACADEMIC HOURS

30 lectures

ECTS CREDITS

20 ECTS

3.1.4. INTRODUCTION IN THE THEORY OF PHASE TRANSITIONS

The course provides basic knowledge of the concepts, methods and models used in the theory of phase transitions and critical phenomena. The approach puts Landau and discussed within certain exactly reshaemi models used in the theory. Particular attention is paid to the phenomenon of spontaneous symmetry breaking method kvazisrednite of Bogolyubov and method of approximating hamilton-Nianel. Presented the ideas of universality and scaling. Discussed the main issues of critical phenomena by examining some just reshaemi models used in the theory Mr. magnetism, superconductivity and structural phase transitions.

Basic knowledge of quantum mechanics and statistical physics. are required

LECTURER

Prof. Nikolay Tonchev, PhD, DSc
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ACADEMIC HOURS

28

ECTS CREDITS

20 ECTS

3.1.5. PHYSICS OF SEMICONDUCTOR HETEROSTRUCTURES

Since 2000, this course is taught annually, the content varies according to the desire of the audience and the speaker. Presents the current status and current problems in the physics of phase transitions, mainly in theory and applications. The emphasis is on mastering the methods of the theory of phase transitions, which are universal in theoretical physics. The course is intended for PhD students of the Master Course and professionals interested in physics and other natural science disciplines. During the first lecture of the course, listeners will be able to propose a modification to the content of the lectures, in view of their specific needs of knowledge

LECTURER

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ACADEMIC HOURS

30 lectures

ECTS CREDITS

20 ECTS

3.1.6. SUPERCONDUCTIVITY

This course is intended for PhD students to get acquainted with the problems of superconductivity, superconducting materials and their application.

LECTURER

Assoc. Prof. E. Nazarova, PhD,
Assoc. Prof. V. Lovchinov, PhD
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ACADEMIC HOURS

18

ECTS CREDITS

20 ECTS

3.1.7. EXPERIMENTAL METHODS IN ATOMIC PHYSICS

The course will look at experimental methods for determining the characteristics of the atomic shell and atomic spectra - energy of the excited atomic and ionic states, the wavelengths of spectral lines, the forces of oscillators of the spectral lines, and ultra fine structure of spectral lines intensity and width of the spectral lines, transition probabilities, radiative lifetimes of excited states, Lande factors. Furthermore, The modern experimental methods and instrumentation and comparison with classical methods will be discussed.

LECTURER

Prof. DSc. K. Blagoev c
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ACADEMIC HOURS

30 lectures

ECTS CREDITS

20 ECTS

3.1.8. METAL VAPOUR LASERS

The specialized course «Lasers Metal vapor» is intended for PhD students in laser physics, radiophysics, physics and quantum electronics, atomic and molecular physics and plasma physics. The course includes the study of physical processes in lasers with metallic vapor, the different types of lasers with metal vapor and their practical application. The course considers in detail the characteristics of the main types of metal vapor lasers and their dependence on the conditions of flow of laser generation. During the course the various types of bits where the laser generation is realized, and the methods used to obtain the necessary for laser generation, the concentration of metal atoms and ions are studied. Shown are the opportunities for practical applications, both in research and in the medical industry. Examined are also the commercial realization of various types of metal vapor lasers worldwide.

LECTURER

Prof. Dr. Nikola Sabotinov, DSc, FBAS
Тел. +359 2 875 6009
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ACADEMIC HOURS

20 lecture hours and 5 lab hours

ECTS CREDITS

20 ECTS

3.1.9. KINDS AND FEATURES OF GAS DISCHARGES USED IN LASERS

The specialized course «Kinds and properties of gas discharges, used in lasers» is intended for PhD students in laser physics, physics and quantum electronics, atomic and molecular physics and plasma physics. The course includes the study of various types of gas discharges and elementary processes in the gas discharge plasma, leading to the formation of inverse densities in different types of lasers with metal vapor (LMP), rare gases and molecules. Special attention is paid to the methods of measurement and calculation of sections for interaction in these processes. Contemplated are methods for the introduction of electrical energy in the discharge plasma by using different excitation schemes.

LECTURER

Prof., DSc Nikolay Vuchkov
 Assoc. Prof. Dr Krasimir Temelkov
 Тел. +359 2 979 5708 ; 979 5708
 E-mail:

ACADEMIC HOURS

20 lecture hours and 5 lab hours

ECTS CREDITS

20 ECTS

3.1.10. LASERS IN DIAGNOSTICS, RESTORATION AND CONSERVATION OF CULTURAL HERITAGE

With the rapid development of lasers, laser methods very quickly established itself as an indispensable tool for the diagnosis, restoration and conservation of cultural monuments. The course includes a brief introduction to the properties of laser radiation and the various methods used for analysis, restoration and conservation of archaeological artifacts and other objects of cultural heritage: laser spectroscopy, LIBS, Raman spectroscopy, optical coherence tomography (OCT), laser interferometry, laser-induced fluorescence (LIF), remote analysis (LIDAR), 3D laser scanning, laser ablation and others. Discussed are the advantages of laser cleaning of various monuments and methods to control the influence of the environment; different methods of preservation, reconstruction, documentation, study and promotion of archaeological sites and artifacts.

The course is interdisciplinary and is suitable for students interested in the physical and chemical sciences, archaeologists, restorers and others specializing in archaeometry.

LECTURER

Asoc. Prof. Dr. Margarita Grozeva
 Тел. +359 2 979 5717 9
 E-mail: margo@issp.bas.bg

ACADEMIC HOURS

22 lecture hours and 8 lab hours

ECTS CREDITS

20 ECTS

3.1.11. OPTICAL PROPERTIES OF THIN DIELECTRIC AND SEMICONDUCTOR LAYERS AND DETERMINATION OF THEIR OPTICAL CONSTANTS BY MEANS OF SPECTROSCOPIC ELLIPSOMETRY

LECTURER

Assoc. Prof. Dr. Anna Szekeres

Тел. +359 2 9795 788

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ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

The basic principles of ellipsometry are created in the last century, but this method of optical materials research began rapid development after the 90s thanks to rapid advances in computer technology, allowing not only to automate the measurement, but also to analyze ellipsometric data..

Currently, the method of the spectral ellipsometry became standard for measuring the thickness of layers and their optical constants and is useful for the characterization of all materials (dielectrics, semiconductors, metals, organic and bio-organic material). Nevertheless, the principles of ellipsometry are difficult, and information from the calculated values (ellipsometric angles Ψ and Δ) is not obvious, for the analysis of ellipsometric angles Ψ and Δ is necessary application of different optical models and powerful optimization programs.

The purpose of this course is to introduce the basic concepts of spectral ellipsometry researchers who want to use this optical method in their work. We will consider briefly the principles of optics, optical properties of materials, such as the propagation of light and dielectric polarization, reflection and light transmittance and optical constants. During the course will be considered polarization parameters and matrices required for displaying the basic equation of ellipsometry, parametric dispersion models for analysis of ellipsometric data and analysis of the dispersion dependences of the optical constants n and k , determined by ellipsometric measurements



2 INSTITUTE OF ELECTRONICS

3.2.1. NANOPHOTONICS

LECTURER

Corresponding Member Prof. DSc
Petar Asenov Atanasov

ACADEMIC HOURS

20 lecture hours

ECTS CREDITS

20 ECTS

Basic principles are stated of sub-wavelength optics, i.e. the fundamentals of the theory of electromagnetic field and Maxwell equations. The concept is given of the surface plasmons and propagation of the of plasmon wave in dielectrics and metals. The propagation of electromagnetic waves in metal structures having sub-wavelength dimensions, as well as algorithm for stationary and dynamic analyses is described.

Based on Mie theory, the analytical methods for analyses are presented as multiple multipole program – MMP, beam propagation method – BMP, Fourier model method – FMM, as well as the most modern computational algorithms as the discrete dipole approximation - DDA and the finite difference and time domain method – FDTD method. Some top-down and bottom-up technologies are described. The most important features of plasmonic and nano-photonic devices are described. Methods of creation of metal nanostructures and nanoparticles in vacuum and in liquid are proposed. Application of metal nanoparticles for photo-thermal therapy, fs lasers based on surface plasmons, data storage based on atom force microscope - AFM are given in brief. The advantages and challenges of sub-wavelength optics are also presented.

3.2.2. INTERACTION OF LASER RADIATION WITH MATTER

The basics of interaction between laser radiation with matter are stated: absorption of laser radiation (optical properties of metals, semiconductors and dielectrics, phase transformation), laser heating (heat conduction into solids, processes during laser treatment), melting and solidification, evaporation and plasma formation during laser-matter interaction. Some examples for modeling of the processes of laser processing are described. The most advanced and modern laser micro- and nano-technologies are given. High pulsed solid states laser systems are described and interaction of ultra-short laser pulses with matter is presented. Laser ablation by ultra-short laser pulses is described as well as formation of plume in vacuum.

LECTURER

Corresponding Member Prof. DSc
Petar Asenov Atanasov

E-mail:

ACADEMIC HOURS

22 lecture hours

ECTS CREDITS

20 ECTS

3.2.3. PHYSICS OF THE WAVES – LASER PHYSICS

In the course are considered common positions amplification and generation of light in quantum systems, the characteristics of laser radiation and methods of management and control. Special attention is paid to the various types of lasers - solid, gas, semiconductor and such liquid active environment.

LECTURER

Corresponding Member Prof. DSc
Petar Asenov Atanasov

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ACADEMIC HOURS

20 lecture hours

ECTS CREDITS

20 ECTS

3.2.4. LASER DEPOSITION AND STRUCTURING OF THIN FILMS

The course addresses the main issues and principles of pulsed laser deposition of different layers - optical, magnetic, high temperature superconducting. Presented and discussed are the most basic and important features of the method. Identification and typical difficulties and shortcomings, as well as methods for their removal are talked about. Discussed are specific examples in decaying of LiNbO₃, Y₂O₃ and KGd (WO₄)₂

LECTURER

Corresponding Member Prof. DSc
Petar Asenov Atanasov

E-mail:

ACADEMIC HOURS

22 lecture hours

ECTS CREDITS

20 ECTS

3.2.5. RANDOM PROCESSES AND STATISTICAL METHODS ON PRACTICAL EXAMPLES FROM NATURAL SCIENCES, ENGINEERING AND SOCIAL SCIENCES

Using a wide range of models from different branches of the natural sciences, engineering and social sciences, the course will introduce doctoral students to basic concepts and methods of the modern theory of random processes and fields. The emphasis of the course is on practical applications. For this purpose, the material is built entirely on examples and tasks.

Specific topics in the first part of the course include stationary / homogeneous stochastic processes / fields of discrete and continuous type with primary focus on the spectral (Fourier) properties of these fields. The second part covers the assessment methods of statistical variables and functions of a sample of experimental data as in the time / space area and also in the frequency domain. This part also studied thoroughly and methods for evaluation of errors of experimental data, confidence intervals in the estimates of parameters and algorithms for generating random lines with desired properties.

The content of the third part is largely determined by the choice and interests of doctoral students. The choice of topics include: filters and predicting the behavior of time series; Kalman filter, nonlinear and non-stationary processes, examples of evolutionary spectra and spectra of higher order stochastic differential equations, equations of Fokker-Planck and Kolmogorov-Chapman.

LECTURER

Sen. Res. Dr. Oleg Yordanov

Tel. (+359 2) 979 5913

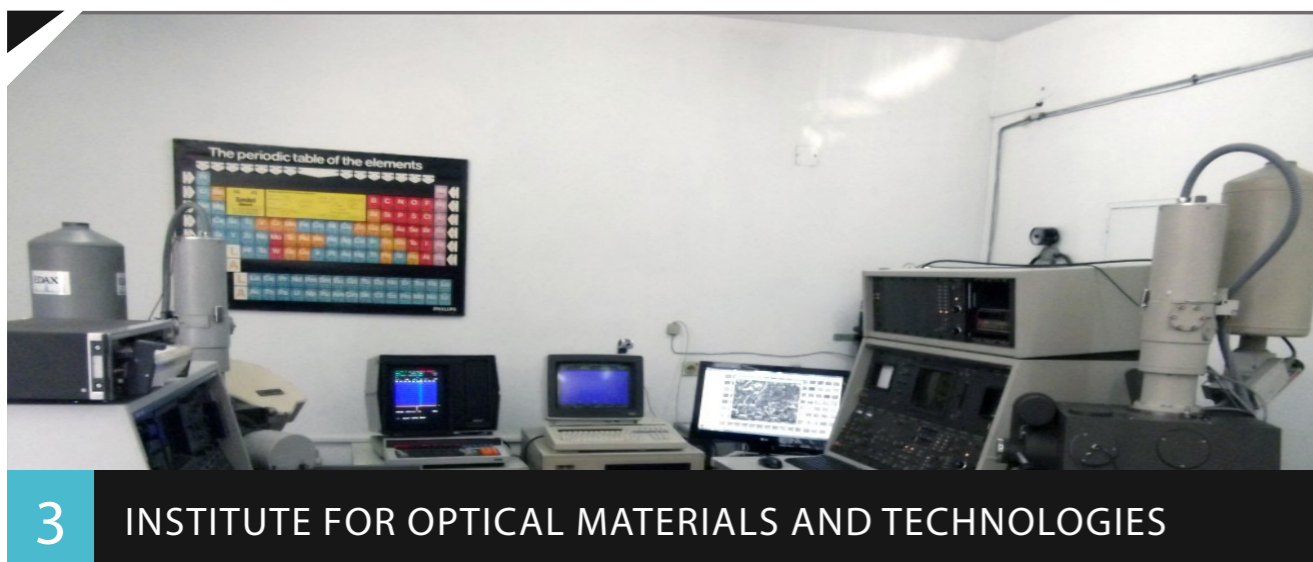
E-mail: oleg.yordanov@gmail.com

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS



3 INSTITUTE FOR OPTICAL MATERIALS AND TECHNOLOGIES

3.3.1. HOLOGRAPHY AND HOLOGRAPHIC INTERFEROMETRY. LIGHT SENSITIVE MATERIALS FOR HOLOGRAPHIC RECORDING

LECTURER

Prof. DSc. Ventseslav Sainov
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E-mail: vsainov@optics.bas.bg

ACADEMIC HOURS

30

ECTS CREDITS

20 ECTS

The lecture course comprises basic methods and principles of holography, types of holograms and their basic holographic characteristics. Scalar diffraction theory and coupled wave theory are used for description of processes of recording and formation of interference patterns as well as for derivation of the main parameters of the holographic process – diffraction efficiency, sensitivity, dynamic range, signal to noise ratio and information capacity.

Modulation for different types of holograms is analyzed in parallel with discussion of light sensitive materials for permanent and reversible holographic recording. They include amplitude and phase materials, discrete and continuous materials and others. The second part of the course includes different branches and applications of holography – display, including multicolor holography, holographic interferometry, holographic metrology and parallel processing of interference patterns, as well as modern approaches for their implementation in research, industry and non destructive testing.

3.3.2. DIGITAL HOLOGRAPHY AND OPTICAL METROLOGY

Digital holography, which records interference pattern of a reference beam with a light beam, reflected from an object, and reconstructs the holographic image by means of computer, finds wide application due to recent advances in laser sources, 2D photosensors, (CCD or CMOS cameras) and digital signal processing. Optical and digital holographic methods are an effective tool for precise remote registration of data about the relief, mechanical and physical properties of macro and micro-objects as well as for 3D visualization of objects.

PhD students get accustomed with the principles of Fourier optics, reconstruction algorithms of digital holograms (Fresnel approach, convolution approach and phase-shifting algorithm). Main approaches for computer generation of holograms are also considered. Holographic interferometry, digital holographic microscopy and visualization of phase objects are also included. Lectures include the theory of speckle phenomena in optics and implementation of speckle-interferometric methods. The main algorithms in optical metrology for processing of fringe patterns as phase-stepping method, Fourier analysis, wavelet technique, minimization of cost-function are discussed. One of the main advantages of this lecture course is the possibility for MatLab programming for composing codes for digital reconstruction of holograms and processing of real images.

LECTURER

Assoc.prof. Elena Stoykova, PhD
Tel. (+359 2) 872 23 91,
GSM 0887 386 175
E-mail: elena@optics.bas.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

3.3.3. MATERIALS FOR OPTICAL DATA STORAGE: DISPOSABLE, REVERSABLE AND NEW ORGANIC/INORGANIC COMPOSITES

The course studies the most commonly used in recent years, light sensitive media for holographic recording. The basic requirements for these materials are presented, which are important to ensure full transfer of the fine interference picture. The basic characteristics, mechanisms for the image formation, specific treatment processes and methods of storage are also studied. This lecture course also introduces recent trends of research for the development and application of new composite materials, consisting mainly of photopolymer matrices as well as some anisotropic materials containing nanoparticles with different forms, consistence and structures.

LECTURER

Assoc. Prof. Dimana Nazarova, PhD

Tel: 359 2 979 3531

E-mail: dimana@iomt.bas.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

3.3.4. OPTICAL PROPERTIES OF ORGANIC / INORGANIC HYBRID MATERIALS AND STRUCTURES

The course is suitable for young scientists, specialists and PhD students - physicists and chemists. The knowledge in optics is not obligatory. The aim of the course is students to gain knowledge of the foundation of thin film optics and methods for optical modeling of homogenous and heterogeneous media. The program consists of Maxwell equations for linear medium, refraction and reflection laws, Snell's law, Fresnel's equations, transmission and reflection coefficients of thin film and film/substrate, transfer matrix approach, multilayers systems. The widely accepted effective medium theories of Maxwell-Garnett, Lorentz-Lorenz and Bruggeman used for modeling of the optical behavior of hybrid structures are also considered. The emphasis is laid on the advantages and disadvantages of different theories and their applications. Some examples of advanced applications of hybrid structures in photonics is discussed.

LECTURER

Assoc. Prof. Tsvetanka Babeva, PhD

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GSM 0884 220 351

E-mail: babeva@iomt.bas.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

3.3.5. POLARIZATION HOLOGRAPHY AND APPLICATIONS: HOLOGRAPHIC DATA STORAGE IN ANISOTROPIC MATERIALS

LECTURER

Assoc. Prof. Lian Nedelchev, PhD
Tel: 359 2 979 3531, GSM 089 6587 254
E-mail: lian@iomt.bas.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

This lecture course gradually introduces the audience to the history and main concept of holography, the terminology used in the field and the general requirements for making a hologram. Some of the most interesting features of the holograms are presented – the parallax effect and the ability to reproduce the entire image of an object even from a small piece of the hologram. Different applications of holography are discussed and the focus is placed on holographic data storage – a technology of the future, offering more than 300 GB of capacity on a CD-sized disc.

Polarization holography allows to register not only the intensity and phase of light, but also its state of polarization i.e. to record the entire information carried by the light field. This is possible only in certain type of materials called photoanisotropic materials. The most effective and therefore most commonly used class of these materials are described – the azopolymers – which have been intensively investigated during the last decades. The applications of azopolymers include recording of optical elements with unique properties, formation of chiral structures that can be used for all-optical switching as well as polarization multiplexing. >Stilbene materials enable polarization recording in the UV and hence allow to increase even further the density and capacity on polarization holographic data storage.

The key advantage of this course is that it presents a modern field of research with very high publication activity in easy to understand way.

3.3.6. ELECTRON MICROSCOPY AND ELECTRON DIFFRACTION AS A TOOL FOR STRUCTURE AND PHASE COMPOSITION ANALYSIS OF MATERIALS

LECTURER

Daniela Karashanova, PhD, Associate Professor
Tel. (+359 2) 979 3519, 979 3523, GSM: 0879 888 149
E-mail: dkarashanova@yahoo.com

ACADEMIC HOURS

30 lecture hours and 15 lab hours

ECTS CREDITS

20 ECTS

The lecture course is addressed to PhD students in speciality 01.05.05 Physical Chemistry with background in theory of matter structure, geometrical and wave optics. The essentiality of this course are transmission (TEM) and scanning (SEM) electron microscopy, electron crystallography and some analytical methods for chemical composition, related with the electron microscopy, as well as the existing different techniques for sample preparation.

Naturally, the course starts with an introduction, concerning the matter's structure theory, fundamentals of crystallography and crystal chemistry, electron – matter interaction. In the main parts, after a historical review of the prerequisites for transmission and scanning electron microscopes elaboration, their set-up and working methods are presented in details. The different microscopes' modes, additional devices and their functions are discussed. The main phenomena and processes, related with the image and diffraction patterns formation and registration are presented. In conclusion, some examples, demonstrating the relation of the electron microscopy and analytical methods, with the contemporary trends of the science and technologies, as synthesis of new materials, nanotechnology, nanoelectronics and new energy sources, are done. An attention to the created computer programmes for imaging and TEM analysis results treatment is paid.

A practical course will be held, also. It aims to acquaint the participants with the sample preparation techniques for TEM and SEM, with the procedures of instruments manipulation (starting, stopping and allignment), as well as to work in different modes of the microscopes and to analyse the obtained results.



4 INSTITUTE OF MINERALOGY AND CRYSTALLOGRAPHY

3.4.1. INFRARED SPECTROSCOPY

The course examines the theory and application of infrared spectroscopy, a powerful method for the study of substances, ranging from basic concepts of spectroscopy and ending with some modern techniques and their application in areas such as geology, mineralogy, biology, biochemistry and suitable for students interested in those fields.

The course includes the following topics:

Basic concepts of spectroscopy - types of spectroscopy, energy levels and transitions between them, units in absorption spectroscopy, energy molecules probability of absorption transitions population of energy levels. Simple theory of vibration spectra - bi-atomic molecule, polyatomic molecule - types of oscillations and characteristic frequencies. The characteristic frequencies and factors affecting them - change of phase, hydrogen bonding effect of the solvent isotope effect, the effect of interactions between oscillation inductive and mesomeric effect Apparatus and equipment - Sources of radiation monochrometers receivers modern boxes and their options Preparation of samples for analysis - gases, liquids and solutions, solids, pastes and films. Characterization of inorganic (mineral oxides, salts) and organic substances

LECTURER

Yuri Kalvachev, Associate Professor
PhD
Rossica Titorenkova, PhD

Tel. +(359 2) 9797055

E-mail: kalvachev@mail.bg

ACADEMIC HOURS

20 lecture hours

ECTS CREDITS

20 ECTS

3.4.2. X-RAY STRUCTURAL ANALYSES

The course aims to give basic knowledge on X-ray analysis. The course discusses the three main parts related to the determination of the crystal structure of the new substances: symmetry of crystal structures, the X-ray diffraction, determination of the structure of the crystalline solid. The exercises are conducted in the laboratory of structural analysis and time allows each student to determine the crystal structure of its own crystal or substances, and to prepare the data for publication.

LECTURER

Rosica Nikolova, Senior Research
Associate, PhD
Boris Shivachev, Senior Research
Associate, PhD

Tel. (+359 2) 870 01 61 47

E-mail: rosica.pn@clmc.bas.bg,
blshivachev@gmail.com

ACADEMIC HOURS

30 lecture hours and 30 lab

ECTS CREDITS

20 ECTS



5 INSTITUTE OF METAL SCIENCE, EQUIPMENT AND TECHNOLOGIES

3.5.1. INTERNAL FRICTION IN METALS AND ALLOYS

This is a phd student program of the speciality 02.09.01.. The aim of the course is to introduce the students to the principles and the potential of the «internal friction» method for investigation of metals and alloys and especially the alloys based on iron. Requirement of the program is possession of Master Degree (MA) of the following specialties: «Technology of Metals»- TU-Sofia, «Material Science» - University of Chemical Technology and Metallurgy – Sofia or «Solid State Physics» – SU- Sofia.

LECTURER

Prof.DSc.Eng Ivan Maximov Parshorov

Tel. +(359 2) 870-35-43

E-mail: parsh@ims.bas.bg

ACADEMIC HOURS

25 lecture hours

ECTS CREDITS

20 ECTS

3.5.2. WELDING DEFORMATIONS, STRESSES AND DISPLACEMENTS

The course is suitable for doctorate candidates with engineering education and qualification. Welding deformations, stresses and displacements are one of the main factors which define the technological strength and workability of the welded joints and constructions. They always accompany to a certain extent the welding process. The aims of the learning process are to be acquire fundamental knowledge in the following directions:

- type and classification of welding deformations, stresses and displacements;
- the reasons for their arising;
- the means and mechanisms of their development;
- their influence on the properties, reliability, workability and safety of the welded joints and constructions;
- their residual values and the possibilities for their reduction and redistribution.

LECTURER

Cor.member, Dsc, Stefan Christov Christov

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E-mail: s.christov@ims.bas.bg

ACADEMIC HOURS

24 lecture hours

ECTS CREDITS

20 ECTS

3.5.3. PHYSICO-CHEMICAL PRINCIPLES OF PRODUCTION, INVESTIGATION AND APPLICATION OF AMORPHOUS METALLIC ALLOYS

Amorphous metallic alloys (metallic glasses) represent a new class of materials of the contemporary Materials science. They belong to the group of precious metallic alloys by which are not the price but the application properties are of basic importance. These alloys are on the first place produced via ultra- rapid cooling of their melts in order to avoid their crystallization in the temperature range between the melting temperature and the glass transition temperature.

The critical cooling rate of most known amorphous metallic alloys is between 104 and 106 k/s. This circumstance demanded the production of metallic glasses to be limited to products in the form of ribbons with thickness ranging between 10-50 microns. Recently bulk metallic glasses were developed for which this thickness limitation was avoided to a great extent as far as they could be produced by rapid solidification of the melt by moderate cooling rates of 1 – 10 K/s. The basic characteristics of of amorphous metallic alloys are their unique physico-chemical and mechanical properties which determine their practical application. This course of lectures is developed on a first place for students, and Ph.D. students of Matherials Science and Technology specialty. The lectures and course of practical training could be useful also for students and Ph.D. students of the specialties «Inorganic chemistry» and as well as «Condensed matter physics». The aim this course is to ensure a minimum of theoretical and practical knowledge on the fundamental physico-chemical principals of vitrification of metallic alloys, as well as on the basic mechanisms of the relaxation processes taking place during their heat treatment. The main fields of application of amorphous metallic alloys are also discussed.

LECTURER

Prof. Dr. Sc. Krassimir Russev
Tel: 359 2 46 26 358, 46 26 280
E-mail: kruss@ims.bas.bg

ACADEMIC HOURS

12 lecture hours and 8 lab hours

ECTS CREDITS

20 ECTS

3.5.4. PHYSICO-CHEMICAL PRINCIPLES OF PHASE TRANSFORMATION INVESTIGATIONS OF AMORPHOUS AND MICROCRYSTALLINE METALLIC ALLOYS PRODUCED VIA RAPID COOLING FROM THE MELT.

This lecture course is intended for students and Ph.D. students who are studying the structure and properties of amorphous and microcrystalline metal alloys and the phase transitions from physicochemical point of view. Students and Ph.D. students should have basic knowledge in Physical chemistry, Physical metallurgy and Material Science. The aim of the course is to give a deeper knowledge about the first order phase transformations and crystallization in amorphous metallic alloys (AMC), and to acquaint the students with thermo-analytical investigation methods.

LECTURER

Dr. Liljana Stojanova Assoc. Prof.
Tel. (+359 2) 4626 358
E-mail: listo@ims.bas.bg

ACADEMIC HOURS

10 hours lectures and 10 hours practical trainings

ECTS CREDITS

20 ECTS

3.5.5. CRYSTALLIZATION IN EXTREME CONDITIONS OF MOLTEN METALS AND ALLOYS (SOLIDIFICATION AT HIGH COOLING RATES AND IN SPACE - VACUUM/MICROGRAVITY CONDITIONS)

LECTURER

Dr. Nikola Stoichev Assoc. Prof.

Tel: 359 2 8714570

E-mail: n_stoichev@ims.bas.bg

ACADEMIC HOURS

20 practical training

ECTS CREDITS

20 ECTS

This scientific course of lecture aims to broaden the knowledge of Ph.D. students in the field of I order phase transformations. It is going to discuss influence of high rates of cooling (so called RSP – rapid solidification processing) on the mechanism of solidification and structure obtained. There will be more information about the unusual influence of microgravity conditions on the processes of melting and solidification as well as crystallization from liquid phase (with special emphasis on solidification of metals and alloys).

The practice of space flights shows that in near future orbital laboratories and even small factories are going to process materials at near absence of terrestrial gravitational effects. It means an absence of gravity-driven convection in the fluid part of the system and more difficult and retarded mass and heat transport. A deep vacuum of the open space, high-energy radiation from the Sun and other sources, and steep temperature gradients could complicate the space conditions on automatic orbital laboratories. All the knowledge about processes influenced by: absence of buoyancy-driven convection, absence of hydrostatic pressure, absence of sedimentation and buoyancy and easier ability of container-less processing, is priceless for the future expanding of life beyond the earth atmosphere.

Ph.D. students should have basic knowledge in Physical chemistry, Physical metallurgy and Solid-state physics.

3.5.6. INTRODUCTION TO OCEAN ENGINEERING

LECTURER

Dr. Rumen Kishev Assoc. Prof.

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E-mail: r.kishev@bshc.bg

ACADEMIC HOURS

24 lecture hours and 6 hours

practical training

ECTS CREDITS

20 ECTS

The course is intended for basic training of specialists and phd students in ship theory and design, marine technologies, oceanology as well as extraction and processing of ocean deposited industrial resources.

The course provides acquaintance with:

- The basic types of structures for ocean resources exploration, economical conditions and prospects;
 - The basic operations in research, installation and operation of marine engineering structures;
 - The fundamentals of design and investigation of the interaction of marine facilities with external conditions;
 - Marine renewable energy resources;
 - Functions of institutions involved in the utilization of marine resources, current regulations and standards.
- Laboratory classes include participation in preparing and carrying out model tests of marine engineering structures in a model tests basin.

3.5.7. METALLOGRAPHY – THEORY AND PRACTICE

This is a Ph.D. student program of the specialties 02.01.02 (materials science and technology) and 02.09.01 (metal science and heat treatment of metals). The aim of the course is to introduce the students to the principles and the potential of the optical microscopy for the investigation of metals and alloys microstructure. Knowledge in materials science and metallography of Master Degree of specialties as «Mechanical engineering» – TU-Sofia, «Metallurgy» and «Materials science» - UCTM-Sofia is required.

LECTURER

Ph.D. Rumiana Lazarova, Associate Professor

Tel: 359 2 46-26 304

E-mail: R.Lazarova@ims.bas.bg

ACADEMIC HOURS

28 lectures

ECTS CREDITS

20 ECTS

3.5.8. METAL SCIENCE- THEORY AND PRACTICE

This is a Ph.D. student program of the specialties 02.01.02 (materials science and technology) and 02.09.01 (metal science and heat treatment of metals). The aim of the course is to introduce the student to the basic principles for obtaining steel and iron, methods for testing the strength and plastic characteristics and standards for conducting these tests. The program provide practical exercises to introduce to the structure of gray, modified and ductile cast iron. There are also practical exercises for calculation of stock materials for obtaining molten steel and cast iron.

LECTURER

Ph. D. Manol Dimitrov Manchev, Associate Professor

Tel. (+359 2) 46-26476

E-mail: m.manchev@ims.bas.bg

ACADEMIC HOURS

28 lecture hours

ECTS CREDITS

20 ECTS



6 INSTITUTE OF GENERAL AND INORGANIC CHEMISTRY

3.6.1. INORGANIC CRYSTAL CHEMISTRY AND X-RAY DIFFRACTION ANALYSIS

LECTURER

Daniela Kovacheva

Тел. +(359 2) 979 2587

E-mail: didka@svr.igic.bas.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

The separation chemistry of the solid state as an independent scientific discipline and theoretical basis of modern materials science, a fact well acknowledged and accepted in the international scientific environment. It is a consequence of the rapid development of modern solid-state technology using non-traditional materials in electronics, mechanical engineering, energy, IT and the media, medicine, space and military technology, environmental protection and so on

According prof. M. Stanley Whiting from the state University of New York, every third chemist deals with problems related to the matter in its crystalline state. For inorganic chemists this share is much higher. Against this background, the university training of Bulgarian chemists in the field of crystal is extremely unsatisfactory. Indeed, in various different courses students acquire knowledge about the elements of crystallography, solid state physics, crystal, but in the absence of one single course, the probability to find someone prepared to work in this field is almost zero. Moreover, the majority of Bulgarian inorganic chemists perceive the matter at the molecular and not crystal level. The introduction of modern technology in the chemical and electronic industries in the country and the world conclusively proved the need for professionals who can think in terms of structure-properties. This type of training gives them a worldview that allows for finding innovative solutions through logical generalization of the knowledge and experience of narrow specialists and technologists.

3.6.2. ATOMIC ABSORPTION SPECTROMETRIC ANALYSIS

Atomic absorption analysis is an analytical method that is increasingly applied because of the high sensitivity which determines over 70 elements of the periodic table, its high selectivity and accessible tools. In the course Atomic absorption analysis are discussed theoretical foundations of analytical chemistry, instrumental methods of chemical analysis, the principle of operation and characteristics of Atomic absorption spectrometry with flame and flameless atomizers, interfering influences, and how their elimination or reduction. Special attention is paid to the direct electrothermal methods for analysis of solid samples. The course is intended for PhD students (chemistry and physics) and for professionals using atomic absorption analysis methods (postgraduate).

LECTURER

Albena Detcheva, PhD

Tel. (+359 2) 979 2504

E-mail: albena@svr.igic.bas.bg

ACADEMIC HOURS

20 lecture hours

ECTS CREDITS

20 ECTS

3.6.3. COMPUTATIONAL MATERIALS SCIENCE

LECTURER

Ph.D. Natasha Trendafilova

Tel: 359 2 979 2592

E-mail: ntrend@svr.igic.bas.bg

ACADEMIC HOURS

30 lectures

ECTS CREDITS

20 ECTS

The aim of the course is to present to the PhD students the advanced theoretical and computational methods and their specific applications for investigation of inorganic systems and materials as well as for prediction of their properties from first principles.

The atomic scale computer simulations is a powerful tool providing access to the microscopic processes of inorganic systems and can thereby contribute enormously to the understanding of chemical structures, properties and reactions. First-principles methods treat the electrons in the model explicitly (quantum-mechanically) and therefore they provide for accurate description of the electronic structure and chemical bonding of the inorganic systems. The benefit of the computational modeling is that it significantly reduces the time of the materials investigation, describes and predicts properties that are not experimentally accessible and directs the design of materials with novel or improved properties. Therefore, the computational modeling and simulations are of great importance for the new materials development in different branches of the industry, ecology and medicine in Bulgaria and at European level. The program of the course envisages to illustrate the theoretical basis of the computational methods as well as their application for: (1) modeling of molecules, clusters and periodic systems; (2) simulation of spectroscopic data (IR, Raman, NMR and electronic spectra) and (3) description of systems in specific environment (gas phase, solution and solid state).

3.6.4. THEORETICAL SPECTROSCOPY OF INORGANIC MATERIALS

LECTURER

Ph. D.Natasha Trendafilova, Associate Professor

Tel. (+359 2) 979 2592

E-mail: ntrend@svr.igic.bas.bg

ACADEMIC HOURS

20 lecture hours

ECTS CREDITS

20 ECTS

The aim of the course is to present to the PhD students the theoretical background of the vibrational, electronical and photo electro-nical spectroscopy and to illustrate their applications for investigation of inorganic systems and materials on the basis of specific examples. The spectroscopy methods are very informative and therefore they are widely used for elucidation of the structure and physicochemical properties of inorganic compounds. The course envisages upgrade of the knowledge of the PhD students in these spectroscopies with the aim to use them for interpretation and analysis of experimental data. Based on the knowledge they will be able to solve practical tasks, to explain and predict materials properties.

3.6.5. COORDINATION CHEMISTRY

The aim of the course is to present to the PhD students the present stage and development of coordination chemistry as a section of the scientific discipline inorganic chemistry. The lectures will present theoretical aspects, methods for investigation of geometrical, electronic and vibrational structure, stereochemistry, syntheses, reactivity, kinetics, conformational analysis and stability, IR, Raman, electronic, NMR, EPR and photoelectronic spectra. Special attention in the lectures will be given to coordination compounds with specific applications in the material science, medicine, agriculture and industry.

LECTURER

Ph.D. Natasha Trendafilova
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ACADEMIC HOURS

20 lectures

ECTS CREDITS

20 ECTS

3.6.6. SAMPLE PRE-TREATMENT IN CHEMICAL ANALYSIS

In the determination of trace elements in samples with a complex matrix composition is necessary analyte to bring in a suitable form and to take measures for separation and concentration of determinable elements in order to increase the sensitivity of the analysis and to avoid or reduce interfering. In the course Sample preparation in chemical analysis are discussed on the chemical analysis, various methods to bring the samples in solution, as well as methods for separating and concentrating before analytical determination. The course is intended for PhD students (chemists or physicists) and for professionals working in the field of chemical analysis (postgraduate).

LECTURER

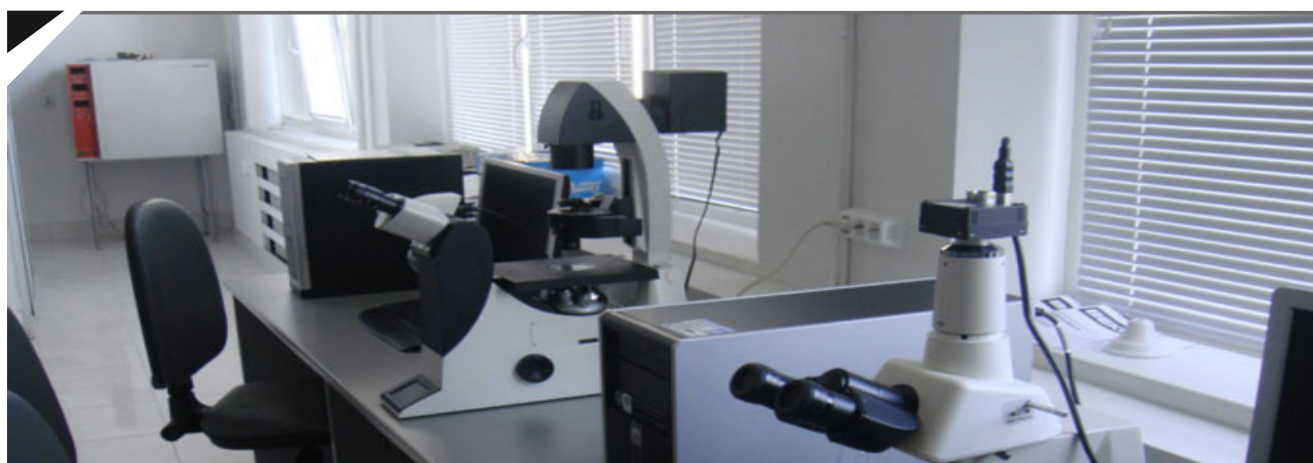
Prof. Elisaveta Ivanova, D.Sc.
Tel. (+359 2) 979 2571
E-mail: eliva@svr.igic.bas.bg

ACADEMIC HOURS

12 lecture hours

ECTS CREDITS

20 ECTS



7 INSTITUTE OF PHYSICAL CHEMISTRY

3.7.1. RELAXATION AND CRYSTALIZATION OF POLYMERS AND GLASSFORMING MELTS

The aim of the course is to acquaint doctoral students with the current state of the science of thermodynamics and kinetics of phase transitions and in particular its application to glass forming melts and polymers. This area of knowledge is highly relevant and intensively studied in our country.

LECTURER

Prof. D. Sci. Dr. Isak Avramov

Тел. +(359 2) 979 2565

E-mail: avramov@ipc.bas.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

In addition to the Institute of Physical Chemistry, strong in this area were formed and the Institute of Polymers, Bulgarian Academy of Sciences, UCT and several departments at Sofia University «St. Kliment Ohridski». The proposed 30 hour course has already been read by the author at the University of Sao Carlos, Brazil and the University of Jena, Germany. Notes to the lectures are uploaded in English and a short version of a Bulgarian <http://ipchp.ipc.bas.bg/PPages/Avramov/lect-en.htm> The course is of interest to young researchers and graduate students working in the field of thermodynamics and kinetics of phase transitions. The course can be read in English or Bulgarian.

3.7.2. FUNDAMENTALS OF ELECTROCHEMISTRY

The aim of the course is to introduce the basic concepts and basic measuring techniques in electrochemistry. The course focuses on practical useful knowledge for successful application of electrochemical techniques for characterization of electroactive materials, tracking of electrochemical processes in the formation of new phases and electroanalytical and sensor applications.

The course is useful for doctoral and professional working in the field of electrochemistry, Electroanalytical method, physical chemistry and materials science.

LECTURER

Prof. DSc Vessela Tsakova

Tel. (+359 2) 9792558, 8719307

E-mail: tsakova@ipc.bas.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

3.7.3. APPLIED ELECTROCHEMISTRY

The objective of the course is to support doctoral students during their training, while also familiarizing them with some of the major cases of practical application of electrochemical individual objects. These are mainly Plating (including alloy) for a specific purpose (better decorative appearance, corrosion protection, for generating and storing hydrogen for electrocatalytic materials for fuel cells, for treatment of contaminated water and air, etc.) methods for their preparation, the main methods for the study of their properties and phase structure, and preliminary preparation of samples themselves and electrochemical / chemical compositions and baths. The course will be of interest for post-graduate students in materials science and electrochemistry

The course is useful for doktorantii professionals working in the field of electrochemistry, Electroanalytical method, physical chemistry and materials science.

LECTURER

Ph.D. Ts. Dobrovolska
Tel: 359 2 9792595
E-mail: tsvetina@ipc.bas.bg

ACADEMIC HOURS

30 lectures

ECTS CREDITS

20 ECTS

3.7.4. PHASE FORMATION AND CRYSTAL GROWTH – THEORY AND EXPERIMENT

You can find the annotation of the course here: [t http://edu.bas.bg/doctorant_school/spec_courses/3_nano/388.doc](http://edu.bas.bg/doctorant_school/spec_courses/3_nano/388.doc)

LECTURER

Assoc. Prof. Mihail Mihailov
Tel. (+359) 0888 226790
E-mail: mike@ipc.bas.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS



8 INSTITUTE FOR CATALYSIS

3.8.1. RELAXATION AND CRYSTALIZATION OF POLYMERS AND GLASSFORMING MELTS

The aim of the course is to acquaint doctoral students with the current state of the science of thermodynamics and kinetics of phase transitions and in particular its application to glass forming melts and polymers.

LECTURER

Prof. D. Sci. Dr. Isak Avramov

Тел. +(359 2) 979 2565

E-mail: avramov@ipc.bas.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

This area of knowledge is highly relevant and intensively studied in our country. In addition to the Institute of Physical Chemistry, strong in this area were formed and the Institute of Polymers, Bulgarian Academy of Sciences, UCT and several departments at Sofia University «St. Kliment Ohridski». The proposed 30 hour course has already been read by the author at the University of Sao Carlos, Brazil and the University of Jena, Germany. Notes to the lectures are uploaded in English and a short version of a Bulgarian <http://ipchp.ipc.bas.bg/PPages/Avramov/lect-en.htm> The course is of interest to young researchers and graduate students working in the field of thermodynamics and kinetics of phase transitions. The course can be read in English or Bulgarian.

3.8.2. FUNDAMENTALS OF ELECTROCHEMISTRY

The aim of the course is to introduce the basic concepts and basic measuring techniques in electrochemistry. The course focuses on practical useful knowledge for successful application of electrochemical techniques for characterization of electroactive materials, tracking of electrochemical processes in the formation of new phases and electroanalytical and sensor applications.

The course is useful for doctoral students and professionals working in the field of electrochemistry, Electroanalytical method, physical chemistry and materials science.

LECTURER

Prof. DSc Vessela Tsakova

Tel. (+359 2) 9792558, 8719307

E-mail: tsakova@ipc.bas.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

3.8.3. APPLIED ELECTROCHEMISTRY

The objective of the course is to support doctoral students during their training, while also familiarizing them with some of the major cases of practical application of electrochemical individual objects. These are mainly Plating (including alloy) for a specific purpose (better decorative appearance, corrosion protection, for generating and storing hydrogen for electrocatalytic materials for fuel cells, for treatment of contaminated water and air, etc.) methods for their preparation, the main methods for the study of their properties and phase structure, and preliminary preparation of samples themselves and electrochemical / chemical compositions and baths. The course will be of interest for post-graduate students in materials science and electrochemistry

The course is useful for doktorantii professionals working in the field of electrochemistry, Electroanalytical method, physical chemistry and materials science.

LECTURER

Ph.D. Ts. Dobrovolska
Tel: 359 2 9792595
E-mail: tsvetina@ipc.bas.bg

ACADEMIC HOURS

30 lectures

ECTS CREDITS

20 ECTS

3.8.4. PHASE FORMATION AND CRYSTAL GROWTH – THEORY AND EXPERIMENT

You can find the annotation of the course here: [t http://edu.bas.bg/doctorant_school/spec_courses/3_nano/388.doc](http://edu.bas.bg/doctorant_school/spec_courses/3_nano/388.doc)

LECTURER

Assoc. Prof. Mihail Mihailov
Tel. (+359) 0888 226790
E-mail: mike@ipc.bas.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS



1 INSTITUTE FOR BIOPHYSICS AND BIOMEDICAL ENGINEERING

4.1.1. ELECTROPHYSIOLOGY OF MOVEMENT SYSTEM

LECTURER

Prof. Andon R. Kossev, PhD, DSc
Тел. +(359 2) 979 37 02
E-mail: kossev@bio.bas.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

The course is intended for doctoral students in the field of physiology of the movement system. The course aims to familiarize the PhD students with the biophysical and physiological bases of the propulsion system and the detailed study of bioelectric phenomena and modern methods for removal of myoelectric activity (electromyography - EMG) and their application to the study of mechanisms of gradation of muscle strength and regulation of movement.

A special place of the method of transcranial magnetic stimulation (TMS). This relatively new method gives a great opportunity to study the central, cortical mechanisms of regulation of movements and enters extensively in research and clinical practice. There are theoretical issues related to the use of EMG and TMJ functional assessment in case of muscle fatigue, which shall constitute interest to graduate students in the field of labor and sports physiology, but also for kinezioterapevti. Offers lectures is theoretical in nature, but there is interest in the possibility of dividing it in two parts - Electromyography and Transcranial magnetic stimulation while providing 2 laboratories (every 4 hours) to acquire and experimental basic skills for using EMG or TMJ methods. Laboratories IBF (section «excitable») and there is a possibility for long-term specialization of doctoral students wishing to acquire EMG or TMJ methods.

3.1.2. INTUITIONISTIC FUZZY SETS

LECTURER

Prof. Krassimir Atanasov
Tel. (+359 2) 979-3602
E-mail: krat@bas.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

Objectives of the course

Providing knowledge of fuzzy and intuitionistic fuzzy sets and skills for estimation of real processes through them.

Assessment methods

Exam syllabus or (at the option of each PhD student) preparing the article / report for publication in a journal or participation in conference

Course contents

The course will include the basic elements of the theory of fuzzy sets and fuzzy intuitionistic and will discuss their main applications in artificial intelligence, economics, industry, and other medical fields. The course lasts 30 hours.

4.1.3. GENERALIZED NETS

Generalized nets (OM) are extensions of Petri nets and other modifications thereof. The course will be given the main results of the theory of OM and discuss their main applications in the field of artificial intelligence, medicine, chemistry, transport, computing and others. You will be given information about resources for program implementation OM models.

LECTURER

Prof. Krassimir Atanassov
Tel. (+359 2) 979-3602
E-mail: krat@bas.bg

ACADEMIC HOURS

30 lectures

ECTS CREDITS

20 ECTS

4.1.4. MODELS OF CONTROL OF HUMAN MOTOR ACTIVITY

The aim of the course is to familiarize PhD students with basic knowledge of the operation and modeling of muscle activity of human limbs in various motor tasks. The course will include basic knowledge of biomechanics, anatomy and physiology of muscles and motor constituent units, as well as basic mechanisms for their management of the human brain. Will be considered various methods for modeling and analysis of bone-joint-muscle system of upper and lower limb of humans. Doctoral students will be familiar with optimization methods to solve statically indeterminate problems in biomechanics and with the software MOTCO (<http://www.clbme.bas.bg/projects/motco/>), created in the Centre of Biomedical Engineering, modeling engine control units in different movements. This software one muscle is modeled as composed of different number and type of motor units and using a hierarchical genetic algorithm to predict the required impulsatsiya of these motor units so as to perform a predetermined movement.

LECTURER

Prof. Dr.Sci. Rositsa Raikova
Tel. (+359) 9700527
E-mail: rosi.raikova@clbme.bas.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

4.1.5. BIOPHYSICS OF EXCITABLE STRUCTURES

LECTURER

prof. Diana Stephanova, DSc
Tel. (+359 2) 979 21 27
E-mail: dsteph@bio.bas.bg

ACADEMIC HOURS

30 lectures

ECTS CREDITS

20 ECTS

The course is intended for PhD students studying excitable (ie neurons nemielinovi and myelinated nerve fibers) of the human body. The course is of interest to graduate students in computer neuroscience and medicine. It is theoretical and its purpose is to familiarize PhD students with ELECTROGENESIS of the above listed excitable structures, biophysics of intra- and extracellular their fields.

A special place as the latest models of computer neuroscience, developed in recent years at the Institute of Biophysics and Biomedical Engineering (section «excitable») and to use the new technique in the world to track the threshold of nerve stimulation in the peripheral and central nervous system of a human. Technique for tracking threshold allows complex registration of indices of nervous activity in healthy subjects and patients with neuropathies and nevronopatii and computational neuroscience allows simulation of the same indices obtained experimentally. The Institute of Biophysics and Biomedical Engineering (section «excitable») there is an opportunity for longer-term specialization of doctoral students wishing to work in the field of computational neuroscience.

4.1.6. PHOTOPROCESSES IN BIOLOGICAL MEMBRANES

LECTURER

Prof. Emilia L. Apostolova
Tel. (+359) 979 26 21
E-mail: emya@obzor.bio21.bas.bg

ACADEMIC HOURS

20 lecture hours and 10 hours
practical training

ECTS CREDITS

20 ECTS

Molecular mechanism of photosynthetic process is the subject of continuing interest. The optimum activity of the photosynthetic apparatus dependent on the efficient absorption of light and the regulation of energy transfer to reaktionnite centers, which is performed by svetosabirashtite complexes. Research of photosynthetic membranes in recent years have shown their dynamic features including changes in structure, composition and function of the photosynthetic apparatus under the influence of environmental conditions.

The course provided lectures to acquaint doctoral students with the modern concepts of organization and the processes in photosynthetic membranes, as well as its strong influence of environmental changes on the structure and functional activity. The exercises provided in this course will allow postgraduates to get acquainted with the equipment and some basic principles of biophysical methods used to study the fotovazbudimite membranes. The lectures and exercises are suitable for PhD in biophysics, biology, plant physiology and biotechnology.

4.1.7. BIOPHYSICS OF PHOTOSYNTHETIC MEMBRANES

A large class of biological membranes in nature are energospyragashtite membranes, which carried out the conversion of light energy into energy macroergic links. Unique in its structure and composition energospyragashtite membranes are the subject of intense research in which unite knowledge and methodology from the fields of biophysics, biochemistry, physical chemistry, etc.

The proposed lecture course aims to give a representative picture of the basic knowledge on the structure, composition and functions of energospyragashtite membranes of various photosynthetic organisms to acquaint doctoral students with the latest achievements of modern science about the nature and characteristics of the processes occurring in them, and main methods for their study. Will be given special attention to the existing unsolved problems in the field of primary processes of photosynthesis and the possible methodological approaches and techniques for their study. The course will include several hours urazhneniya in absorption and fluorescence spectroscopy, fast fluorescence polarographic methods for determining the oxygen separation and absorption, application of EPR spectroscopy in studies of photosynthetic membranes and processes them. The course will now be suitable for candidates with knowledge and interests in the field of biophysics, biochemistry, physics and biology.

LECTURER

Prof. Dr. Maya Yaneva Velitchkova

Tel. (+359 2) 979 2621

E-mail: mayav@obzor.bio21.bas.bg

ACADEMIC HOURS

20 hours lectures and 8 hours

practical training

ECTS CREDITS

20 ECTS

4.1.8. COMPUTER-AIDED DRUG DESIGN

The course aims to introduce the PhD students to the basic principles and methods for drug development by using computational approaches (also known as in silico approaches to drug design) and to give them the basic skills for their implementation. The subject matter is highly interdisciplinary: it uses knowledge of pharmacology, molecular biology, organic and quantum chemistry, molecular mechanics, analytical methods for structural analysis, mathematical and engineering disciplines (statistics, pattern recognition, informatics, etc.).

The program of the course includes ligand- and structure-based approaches based on quantitative structure-activity relationships (QSAR) analysis and molecular modeling. The goal is to characterize the relationship between the chemical structure of the compounds and their effects expressed by models (two-dimensional or 3D (molecular)), where the effect can be therapeutic, toxic, etc. The aim is, on one hand, to better understand the molecular mechanisms leading to these effects; on the other hand – to predict the effects from the models. In practical terms, the PhD students will learn about the latest molecular modeling software and its application for building structures, optimization, calculation of structural descriptors, deriving structure-activity models, analyzing ligand-protein interactions etc.

LECTURER

Prof. DSci. Ilza Pajeva

Tel. (+359) 979 3605

E-mail: pajeva@biomed.bas.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS



2 INSTITUTE FOR BIOLOGY AND IMMUNOLOGY OF REPRODUCTION

4.2.1. FUNDAMENTAL AND REPRODUCTIVE IMMUNOLOGY

LECTURER

Assoc. Prof. Milena Mourdjeva
Тел. +(359) 894 224 865
E-mail: milena_mourdjeva@abv.bg

ACADEMIC HOURS

26 lecture hours

ECTS CREDITS

20 ECTS

The course is intended for doctoral students in the field of physiology dvigatel'neta system. The course aims to familiarize the PhD students with the biophysical and physiological bases of the propulsion system and the detailed study of bioelectric phenomena and modern methods for removal of myoelectric activity (electromyography - EMG) and their application to the study of mechanisms of gradation of muscle strength and regulation of dvizhenietiyata .

A special place of the method of transcranial magnetic stimulation (TMS). This relatively new method gives a great opportunity to study the central, cortical mechanisms of regulation of movements and enters extensively in research and clinical practice. There are theoretical issues related to the use of EMG and TMJ functional assessment in case of muscle fatigue, which shall constitute interest to graduate students in the field of labor and sports physiology, but also for kinezioterapevti. Offers lectures is theoretical in nature, but there is interest in the possibility of dividing it in two parts - Electromyography and Transcranial magnetic stimulation while providing 2 laboratories (every 4 hours) to acquire and eksperimentalni basic skills for using EMG or TMJ methods. Laboratories IBF (section «excitable») and there is a possibility for long-term specialization of doctoral students wishing to acquire EMG or TMJ methods.

4.2.2. EMBRIOBOITECHNOLOGY IN FARM ANIMALS

The purpose of this course is to expand students' knowledge in the field of embriobiotehnologiite in animals. Will be held theoretical and practical preparation to study the characteristics in in vitro breeding methods, modern approaches and specific features of the biological aspects of the application of biotechnology in vitro, as well as opportunities for non-surgical embriotransplantatsiya in animals.

The course is addressed to PhD students working in the field of animal husbandry and veterinary medicine, biological and biomedical sciences

LECTURER

Prof. Dimitrina Kacheva
Tel. (+359 2) 872 00 18
E-mail: dikacheva@hotmail.com

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

4.2.3. WORK WITH MODERN EQUIPMENT FOR BIOMEDICAL ANALYSIS - COMPUTERIZED SPERM ANALYZER, HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC), CONFOCAL FLUORESCENT MICROSCOPY

The purpose of this course is to expand students' knowledge of work with modern equipment, which can be carried out laboratory analyzes scientific and practical applicability in various fields of human and veterinary medicine. Equipment was purchased with funds from the Institute in a program to increase the research capacity of researchers. Project funds to the 7th Framework Programme of the European Union - ReProForce.

The course is addressed to PhD students working in scientific fields - Agricultural Sciences and Veterinary Medicine and Health and Sports. Way of assessing the knowledge acquired will be done by conducting interviews with the speakers.

LECTURER

Prof. Maria Georgieva Ivanova, PhD

Tel. (+359 2) 971 13 95

E-mail: kichevamar@abv.bg

ACADEMIC HOURS

30 hours lectures

ECTS CREDITS

20 ECTS

4.2.4. MOLECULAR MECHANISMS OF CELL PROLIFERATION, DIFFERENTIATION AND REGULATION IN THE REPRODUCTION

The course aims to acquaint doctoral students with the basic mechanisms of the processes of cell proliferation, differentiation and apoptosis during gametogenesis. Simultaneously, it will be presented the latest concepts and hypotheses on regulatory mechanisms and factors of interaction between cells in the reproductive system of the ligand-receptor level. Special attention will be paid to the molecular mechanisms associated with activation of gametes of post-embryonic de novo oogenesis and folliculogenesis and immune mechanisms of ovarian function. Will be considered communicative interactions between cells in multicellular organism; cellular and intercellular signaling, hormonal and enzymatic regulation. The course is addressed to PhD students working in the field of Biological and Biomedical Sciences

LECTURER

Assoc. Prof. Pavel Rashev

Tel. (+359) 872 00 18

E-mail: pavel_rashev@abv.bg

ACADEMIC HOURS

26 lecture hours

ECTS CREDITS

20 ECTS



3

INSTITUTE FOR EXPERIMENTAL MORPHOLOGY, PATHOLOGY AND ANTHROPOLOGY WITH MUSEUM

4.3.1. MOLECULAR ONCOVIROLOGY

LECTURER

Assoc.Prof. Evelina Shikova-Lekova,
MD, PhD

Тел. +(359) 979 2339

E-mail: eshikova@yahoo.com,
evelina_sh@abv.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

The course aims to expand the doctoral students knowledge in the field of molecular virology emphasizing the oncovirology, providing a detailed analysis of oncogenic viruses and mechanisms by which they induce tumors in humans and animals. At the beginning students are introduced to the general principles and characteristics of cell transformation induced by viruses.

A presentation of the current approaches and techniques used to study these viruses and diseases they cause is included. Coverage includes also a detailed presentation of all RNA and DNA oncogenic viruses – characteristics, mechanisms of oncogenicity, diagnostics, therapy. Additionally, several lectures are devoted to the clinical applications of oncogenic viruses for cancer treatment, including the employment of viral vectors for vaccine and gene therapy. The course is primarily intended for PhD students in virology, cell and molecular biology, biochemistry, pathology and oncology.

4.3.2. DNA-REPLICATION, RNA-TRANSCRIPTION, PROTEINE TRANSLATION AND CELL DIVISION- MORPHOLOGICAL ASPECT

LECTURER

Assoc. Prof. Russey Russev, DVM, PhD

Tel. (+359 2) 979 23 89

E-mail: russyrussev@abv.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

The course aims to expand knowledge of the PhD students / biologists, doctors, veterinarians and others / about the possibilities of electronic microscopy and molecular morphology as a tool for visualization of the fundamental biological processes in the cell as DNA replication, RNA transcription, translation of proteins and cell division.

An accent will be given to the peculiarities of the structure and functions of all cellular organelles involved in these processes, will be presented as well and original data for certain structures in the cell nucleus and their functions as such as nuclear matrix, RNP-structures, NOR, etc.. Prepared material for illustration / 78 slides and 14 schemes / is the result of our long-standing research presented as publications in prestigious international journals. PhD students will become familiar with the methods used in these studies - these are the most modern morphological methods routine in a small number of leading European laboratories such like the «Spread» Mieler technique for visualization of DNA and RNA, electron microscopic autoradiography, electron microscopic immunohistochemistry and others. It is expected this training course to be complementary to the notion of fundamental biological processes in the cell, obtained from university education and to benefit the completion of the general biological culture of the students.

4.3.3. THEORY AND PRACTICE OF CLASSIC AND CONTEMPORARY HISTOLOGICAL TECHNIQUES

The specialized course aims to provide knowledge and training for PhD students on principles and practice of classical and advanced histological techniques that are widely applied in the field of experimental morphology and pathology and cell biology. The course program is designed according to the mission and priorities of the Institute of Experimental Morphology, Pathology and Anthropology with Museum. The training accentuates on the importance of the advanced techniques for fundamental achievements in the field of cell biology relating to elucidation of regulatory mechanisms of cell interaction mediated by hormones and growth factors. The course also focuses on the application and practical use of different techniques for clinical investigations in terms of development and improvement of diagnostic markers of various diseases. The course is addressed to PhD students in the field of experimental morphology and pathology, cellular and molecular biology.

LECTURER

Prof. Nina Nedeva Atanassova, PhD, DSci

Tel. (+359 2) 979 23 36

E-mail: ninaatanassova@yahoo.com

ACADEMIC HOURS

30 hours lectures

ECTS CREDITS

20 ECTS

4.3.4. ANIMAL CELL CULTURE

The techniques of animal cells cultivation have been used in almost all areas of contemporary biology in the recent years. The present course aims to give the PhD students basic knowledge in the field of cell and organ cultivation, to introduce the evaluation methods of cell growth and survival in culture, cryoconservation of animal cells and application of animal cells for the measurement of the biological activity of drugs and other active substances. The course is focused on all PhD students aiming to use cell cultures in their future work – morphologists, cytologists, cell and molecular biologists.

LECTURER

Prof. Elena Bogdanova Nikolova, DSci

Tel. (+359) 979 23 61, 979 23 19, 0887467548

E-mail: enikolova@bas.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

4.3.5. MOLECULAR MECHANISMS OF CANCEROGENESIS AND NEW STRATEGIES IN CANCER PREVENTION, DIAGNOSIS AND TREATMENT

The course will summarize the data available about molecular mechanisms (signal pathways, oncogenes, tumor suppressor genes) of cancerogenesis, tumor progression and spontaneous regression, metastases. In vitro and in vivo model systems, principles and methods in experimental oncology and oncopharmacology will be presented. Challenges in current cancer chemotherapy (heterogeneity of tumor cells, multidrug resistance, cancer stem cells, the escape of cancer cells from the immune system) and promising new strategies for targeted cancer treatment (application of monoclonal antibodies, photodynamic and boron neutron capture therapy, gene therapy, nanotechnologies) will be one of the main topics. Special attention will be given to the new opportunities for early diagnosis and prevention.

LECTURER

Assoc. Prof. Radostina Ivaylova Alexandrova, PhD

Tel. (+359 2) 9793678

E-mail: rialexandrova@hotmail.com

ACADEMIC HOURS

30 hours lectures

ECTS CREDITS

20 ECTS

4.3.6. INTRODUCTION IN CELL AND TISSUE ENGINEERING

The aim of the course is to present the experimental models and strategies in current cell and tissue engineering, the advantages, challenges and perspectives for this new and innovative field of biomedical research. Development of genetically engineered cell lines and animal models. Why to say "Yes" and when to say "No"? Do stem cells can help us to fight against cancer, heart disease, diabetes, neurodegenerative disorders? Why is not so easy to prepare "artificial" organs and tissues? What is the role of nanotechnologies? These are some of the questions that will be discussed during the course. Special interest will be focused on hybridoma technique and preparation and application of monoclonal antibodies as well as on possible application of mesenchymal stem cells in the treatment of bone defects and cancer. Demonstration of some methods for biocompatibility assessment of new materials will be also performed.

LECTURER

Assoc. Prof. Radostina Ivaylova Alexandrova, PhD

Tel. (+359) 9793678

E-mail: rialexandrova@hotmail.com

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

4.3.7. VIRUSES AND IMMUNITY

The course covers three parts. The first part will summarize data about the biology of the innate and acquired immunity. The cells, molecules and mechanisms of the humoral and cellular immune response (especially antiviral) will be discussed as well as the participation of viruses in some immunopathologies such as hypersensitivity reactions, immune deficits etc. How do viruses escape from the immune system of the host? Is it possible for viruses to induce autoimmunity? What is their role in tissue and organ transplantations? The second part will present the application of some immune, molecular biological and genetic methods in experimental and clinical practice for the study of viral antigens and antiviral immunity. The third part is devoted to the challenges and prospects of non-specific and specific immunoprophylaxis and immunotherapy of viral infections.

LECTURER

Assoc. Prof. Radostina Ivaylova
Alexandrova, PhD

Tel. (+359 2) 9793678

E-mail: rialexandrova@hotmail.com

ACADEMIC HOURS

30 hours lectures

ECTS CREDITS

20 ECTS



1 INSTITUTE FOR BIODIVERSITY AND ECOSYSTEM RESEARCH

5.1.1. CONTEMPORARY METHODS AND APPROACHES IN TAXONOMY

The development of modern taxonomy is connected with the application of new cytogenetical and molecular biological methods and approaches. Every species has a species specific organized genome, which has been formed in the evolutionary process as a result of many structural chromosome and genome alterations. It is important to know the species specific genome characteristics and mechanisms involved in genome reorganization during the evolution.

In the course presented will be studied the structural and functional characteristics of eukaryotic chromosome which are important for taxonomy and systematic. Different chromosome types and heterochromatin structure will be analyzed. Heterochromatin will be considered as a "dynamic structure" in evolutionary process. Special stress will be done on the structural chromosome and genome rearrangements, their role in the creating of reproductive isolating mechanisms. The population mutability will be shown on many examples among the animals and plants, the population heterogeneity and the significance of population mutability for evolutionary process will be considered. Study of the structural and functional organization of the genome will provide the important information of different processes at individual, population and community levels. The development of modern taxonomy is connected with the application of new cytogenetical and molecular biological methods and approaches. Every species has a species specific organized genome, which has been formed in the evolutionary process as a result of many structural chromosome and genome alterations. It is important to know the species specific genome characteristics and mechanisms involved in genome reorganization during the evolution.

LECTURER

Prof. D.Sc., Dr. Paraskeva Michailova
Тел. +(359) 988 51 15 (721)
E-mail: michailova@zoology.bas.bg

ACADEMIC HOURS

20 lecture hours

ECTS CREDITS

20 ECTS

5.1.2. PLANT BIOTECHNOLOGIES FOR PRESERVATION OF RARE AND MEDICINAL PLANTS

The course in plant biotechnologies for preservation of rare and medicinal plants is addressed mainly to biotechnologists and biologists-botanists, but could be useful for those working in the field of the phytochemistry and the medicine sciences as well.

LECTURER

Dr. Marina Stanilova, assoc. prof.
Tel. (+359 2) 979 21 98
E-mail: maris@bio.bas.bg

ACADEMIC HOURS

20 lecture hours

ECTS CREDITS

20 ECTS

During the last decades the problem of biodiversity loss is becoming more and more important all over the world. Medicinal plants are especially vulnerable because of their gathering from the nature due to the increasing market demand of drugs. Plant biotechnologies are considered as alternative and complementary means for preservation of rare, threatened, and medicinal plant species, in parallel with application of in situ measures. The course includes different in vitro techniques: rapid micropropagation and ex vitro adaptation, somatic embryogenesis and artificial seeds, cryopreservation, cultivation in temporary immersion system and bioreactors, etc. The effects of different factors on the culture growth and the in vitro biosynthesis of bioactive substances are discussed: genotype, type of the culture, medium composition, cultivation conditions. The advantages and the challenges of the in vitro biosynthesis of secondary metabolites are outlined, and examples of successful industrial production are given.

Beside the theoretical course, the PhD-students will benefit by the opportunity to get some experience on basic in vitro techniques during the laboratory practice.

The course will help the PhD-students to plan their own experimental work correctly, in order to apply statistical analyses of the data. The result interpretation in case of interaction between several tested factors will be examined on the basis of the scientific experience of the Biotechnological laboratory of medicinal plants, at the Institute of biodiversity and ecosystem research.

5.1.3. CONSERVATION OF BIOLOGICAL DIVERSITY: THEORETICAL ASPECTS AND METHODOLOGICAL APPROACHES

LECTURER

Professor Boyko B. Georgiev, Dr. Stoyan Nikolov

Tel. (+359 2) 870 50 12

E-mail: bbg@ecolab.bas.bg

ACADEMIC HOURS

30 hours lectures

ECTS CREDITS

20 ECTS

This course aims to present basic knowledge of the biological diversity concept and the principles of the conservation biology. The introductory series of lectures is devoted to the roots and development of the concept of biodiversity, the elements of the International Research Programme DIVERSITAS, factors determining the biodiversity loss at global scale and mechanisms responsible for it and the main international agreements on the biodiversity.

The second part introduces principles of the conservation biology: organization levels and quantification of the biodiversity; indicator and key species, key structures and ecosystem "engineers"; invasive species, trophic cascades and behavioral ecology; main concepts of the metapopulation theory; conservation of habitats and principles of the development of the protected areas and ecological networks. The course is targeting PhD students in ecology and ecosystem conservation, zoology, botany, hydrobiology, entomology, parasitology and mycology. It might be also of interest for PhD students working on aspects of biodiversity studies and nature conservation in the frames of other branches of science (e.g. microbiology, molecular biology, genetics and forestry).



1 INSTITUTE FOR GEOLOGY

6.1.1. GEOLOGY OF BULGARIA IN THE LIGHT OF THE MODERN TECTONIC HYPOTHESES

This course is aimed at a vast audience of geologists (stratigraphers, sedimentologists, petrologists, tectonists), geomorphologists, geographers and geophysicists. The modern geotectonic and geodynamic hypotheses (plate tectonics, tectonometamorphic terranes, extensional tectonics with exhumation of core complexes; rotational deformations and turbulent tectonics; mantle convection and channel flow) are often applied to the geology of Bulgaria and the Balkan Peninsula in a mechanical way. The aim of the course is to present the geologic structure and evolution of our region in a systematic way, and to demonstrate both the principal features of the multi-faceted geologic processes, and the unresolved problems and the flaws and controversies in the application of the modern hypotheses.

LECTURER

Ivan Zagorchev, Ph.D., D.Sc.,
Professor, Corr. Member
Christo Dabovski, Ph.D., D.Sc.,
Professor, Corr. Member

Тел. +(359) 9792205; 9792267;
GSM 0899590869

E-mail: i_zagorchev@geology.bas.bg,
cndab_h@geology.bas.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

6.1.2. BASIC OF THE LINEAR GEOSTATISTICS AND ITS APPLICATION FOR THE NATURE SCIENCES

The conventional statistics are based on random and independent variables, and the presumption of no existence of data continuity. Thus, it is impossible to enlarge the impact of the variable in the space. The Geostatistics are also using the statistical approaches, but at the same time the method integrates the space distribution of the data, as well the mathematical theories of correlation functions, random fields and fractals. The method is used for analyses of data depending of their space position, and for consecutive creation of 2-D, 3-D, even 4-D models, grounded on the data interpretation.

Prof. G. Matheron from the High National School of Mines of Paris (France) created at the end of the 70-teen years of the past century the elegant Theory of the Regionalized Variables and the Random Functions, aimed to resolve some specific problems of the more precise evaluation of the reserves of natural mineral deposits. The Geostatistics, as a method for practical purposes, has been developed from a number of centres worldwide, the most known from them are the the Centre of geostatistics of the High National School of Mines of Paris (Fontainebleau, France), the Department for Applied Earth Sciences, Stanford, CA (USA), Bryan Mining and Geology Research Centre in Australia, and others. During the process of perfection of the methodology powerful software packages have been created for computer processing of enormous volumes of data. The application of the method now is far surpassing the borders of the geological and mining investigations. At the moment the method is used widely for processing and interpretation of data from the agriculture (crop, vermin, content of useful elements in the soil), fishing in the ocean (assessment of the quantitative volume of fishes), ecology (pollution of the air and the soil), engineering geology (assessment and characteristics of the ground and sites of particularly important facilities), oil and gas explorations (evaluation of the collectors capability of the layers), zoology (different types of analyses on animal populations), mapping (optimisation of the interpolation between the points of measurements), etc.

The course is oriented for a wide circle of Ph.D. students and specialists from different branches of the Natural sciences. The participants in the course need to have basic knowledge on the classic mathematical statistics and to be familiar with the personal computers. The aim of the course is to introduce the Ph.D. students in the Linear Geostatistics and to show through examples from different type of studies (geology, geophysics, zoology, ecology, agriculture and others) the possibility for more correct analyses of the information and discovering of intrinsic, often hidden characteristics of the studied phenomena. Practically, the participants will acquire a knowledge to work with one intelligent tool for analysis of discrete data in the time and the space.

LECTURER

Prof. Stefan Boyanov Shanov, Ph.D,
D.Sc.

Tel. (+359 2) 979 22 47, 888 443 706

E-mail: s_shanov@geology.bas.bg, s_shanov@abv.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

6.1.3. PALAEOECOLOGY. MAIN METHODS USED IN PALAEOECOLOGICAL STUDIES

This course is addressed to geologists, geomorphologists, biologists and other specialists who are interested in ecology. The course emphasizes understanding the interrelation organism/environment in the geologic past: living conditions in past geological periods; interrelations between organisms and their environment (biotic and abiotic factors); variation in the organisms during the processes of life evolution on the Earth. Particular interest is the methods applied in paleoecological studies: morphofunctional, actualistic, taphonomic, quantitative, experimental and biogeochemical (paleotemperature, paleohalometry). Other aspects in the applying palaeoecology are also discussed: the trends in the climatic changes; the using of different index organisms for the palaeoecological reconstructions in paleobasins; determinations the trends of acidification, eutrophication, etc. in modern basins.

LECTURER

Assoc. Prof. Nadja Ognjanova-Rumenova, PhD

Tel. (+359 2) 9792228

E-mail: nognjan@geology.bas.bg

ACADEMIC HOURS

30 hours lectures

ECTS CREDITS

20 ECTS

6.1.4. METHODS OF MINERAL IDENTIFICATION

The course is targeted on PhD students in Mineralogy, but can also be useful for all kinds of researchers from the solid state branch of the geological sciences: petrology, geochemistry, geo-ecology, lithology, coal geology, as well as for some engineering branches, dealing with natural or synthetic materials with macromolecular structure.

Mineral identification is based on a complementary set of methods for determination of both chemical composition and crystal structure. Since the term Mineral refers to solid state compounds with specific chemical composition and crystal structure, special attention will be paid to inherent inhomogeneity phenomena which need to be respected during identification. Taxonomic difficulties related to sector zoning, isomorphism, polytypism will be considered in respect to mineral identification methodology.

The course will include a critical review of the classical mineral identification methods and will focus on modern analytical tools like EPMA, XRD, software for processing of raw analytical data and databases for mineral identification. The applicability field of each component method will be outlined, using proper examples.

LECTURER

Assoc. Prof. Dr. Thomas Kerestedjian

Tel. (+359) 9792244

E-mail: thomas@geology.bas.bg

ACADEMIC HOURS

20 lecture hours

ECTS CREDITS

20 ECTS

6.1.5. ISOTOPE HYDROGEOLOGY

LECTURER

Assoc. Prof. Vladimir Hristov, PhD
Tel. (+359 2) 9793473; 0884788726
E-mail: vhh@geology.bas.bg

ACADEMIC HOURS

30 hours lectures

ECTS CREDITS

20 ECTS

The course is intended for hydrogeologists but could be also useful for hydrologists and geologists.

Recently, hydro-chemical and isotope methods in a large scale are applied in hydrogeology at many countries. This investigation is relatively a new scientific tendency in hydrogeology and usually it is preliminarily applied - before expensive research and exploitation drilling. The main advantage of isotope methods is their relatively prompt implementation and low price for field and laboratory works.

The course "Isotope Hydrogeology" include general information about some hydro-chemical methods as well important data about stabile and radioactive isotopes; application of different isotope methods in hydrogeology for tracing ground waters genesis and dynamic; ground water velocity of movement and age (residence time) etc.



2 NATIONAL INSTITUTE FOR GEOPHYSICS, GEODESY AND GEOGRAPHY

6.2.1. LANDSCAPE CHANGE ANALYSIS USING REMOTE SENSING AND GIS

LECTURER

Assoc. prof. Rumiana Vatseva, PhD
Tel. +(359) 870 02 04; 979 33 70
E-mail: rvatseva@gmail.com

ACADEMIC HOURS

30 hours - 16 hours of lecture, 16 training hours, 4 hours-seminars

ECTS CREDITS

20 ECTS

The proposed course is focused on the using of Remote Sensing and GIS in the mapping, assessment and analysis of landscape changes for different applications, such as landscape management, natural resources assessment, and, more generally to support economic, social, and environmental policies. The theoretical-methodological aspects of the application of remote sensing and land cover/land use data to landscape change identification will be presented and discussed.

The course introduces satellite image interpretation for land cover/land use mapping and change detection based on a computer aided visual interpretation (CAVI) of images. The basic concepts of land cover classification and mapping will be presented. The landscape change identification and analysis based on land cover/land use changes and various indicators characterizing the state of the landscape will be introduced. Some applications at national, regional and local level, for instance, in case of changes concerning urbanized, agricultural or forest landscape will be given and discussed.

Perequisites: Basic understanding of computer operations and basic Remote Sensing and GIS-knowledge.

6.2.2. ENVIRONMENTAL RISK ANALYSIS

The course provides a theoretical base for environmental risk assessment and analysis. The first part of the course relates to the existing paradigms, concepts and classifications, and the second part stress on the methodological approach for risk analysis of different hazards observed on the territory of Bulgaria. A special attention is paid on the implementation of the geo-information technologies for environmental risk analysis.

LECTURER

Assoc. Prof. Mariyana Nikolova, PhD
Tel. (+359) 870 02 53
E-mail: mn@bas.bg

ACADEMIC HOURS

15 lecture hours and 5 hours for individual work with students

ECTS CREDITS

20 ECTS

6.2.3. INTRODUCTION TO GIS AND WORK WITH ARCGIS

The main objective of the course is to give the basics of the Geographic Information Systems (GIS) and skills for working with ArcGIS software. The course participants will gain knowledge on the main features and principles of Geographic Information Systems, data models and structures in GIS, coordinate systems and different tools in ArcGIS. They will also develop skills in data editing in GIS, mapping, use of spatial analysis and modeling within ArcGIS.

LECTURER

Assoc. Prof. Stoyan Nedkov, PhD
Tel. (+359) 979 33 60
E-mail: snedkov@abv.bg

ACADEMIC HOURS

6 lecture hours, 12 hours practical training

ECTS CREDITS

20 ECTS

6.2.4. INTRODUCTION TO FREE AND OPEN SOURCE GIS. INTRODUCTION TO QUANTUM GIS

In recent years, free and open source GIS software and tools are gaining as a real alternative to commercial software product. Free and Open Source Software allow users access to the source code and modify it, edit it, improve it and adapt it to their own needs, and redistribute it (Open Source Initiative: <http://www.opensource.org/osd.html>). Programmer all around the world are developing different free and open source GIS software and tools which find use related in different applications. But their effective use requires profound knowledge on their functionality and integration.

The aim of this course is to provide a basic introduction of the open source software concept as well as of some available free and open source software for GIS with easy-to-follow guidance. Hands-on training sessions will be conducted to process, manage, analyse, and display geospatial data using Quantum GIS.

The 30 hours course will take place in a mixed form: theoretical sessions - lectures, in combination with practical sessions. The contents, methods and techniques presented on the theoretical sessions will be applied in the practical sessions. Prerequisites: Basic understanding of computer operations and basic GIS-knowledge.

LECTURER

Dr. Emilia Tcherkezova
Tel. (+359) 979 6309
E-mail: eti01@web.de

ACADEMIC HOURS

10 lecture hours and 20 hours
practical training

ECTS CREDITS

20 ECTS

6.2.5. EURASIAN GEOPOLITICS IN THE 21 CENTURY: RUSSIA AND ITS NEIGHBORS

The 30-hour course will consist of lectures, discussions, and preparation of a research paper.

The course analyzes the geographic context of the foreign policies of the 15 states that belonged to the Soviet Union. In addition to the contemporary Russian geopolitical perspectives, particular attention will be extended to the Black Sea region, where many states are currently in search of "adequate" geo-strategy and foreign policy.

The course will synthesize the ongoing dramatic geopolitical realignments and relate them to the past political and economic realities, religious, nationalist, and ethnic issues along the periphery of the largest state in the world. Students will be encouraged to conduct their own "hands-on" research and work extensively with maps to develop deeper specialization in a particular state from this area. The main goal of the course is to generate informed discussions of current issues and developments and enable students to better understand and appreciate the distinctive relationship between politics and its geographic context in this vast and extremely dynamic region.

LECTURER

Associate Professor Boian Koulov
Tel. (+359) 979-3367
E-mail: bkoulov@yahoo.com

ACADEMIC HOURS

6 lecture hours, 12 hours practical
training

ECTS CREDITS

20 ECTS

6.2.6. ENVIRONMENTAL POLICY INTEGRATION FOR SUSTAINABLE REGIONAL DEVELOPMENT

The 30-hour course will consist of lectures, discussions, and preparation of a research paper.

The substantial deepening of European Union (EU) integration and its continuing spatial expansion have forced policy-makers to look for new approaches to manage conflicts that span different policy sectors and incorporate environmental and territorial/regional policies across sectors and regions. The attempts at integration of territorial/regional and environmental policy objectives in sectoral policy-making have produced newly emerging policy fields, like environmental policy integration (EPI). This course reviews selected literature and analyzes the innovative approaches and instruments used within the fields. It also presents preliminary conclusions on their applicability in the recent EU Member State of Bulgaria.

LECTURER

Associate Professor Boian Koulov
Tel. (+359) 979-3367
E-mail: bkoulov@yahoo.com

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

6.2.7. HYDROCHEMISTRY AND WATER RESOURCES PROTECTION

The course aims to introduce graduate students and students in the theoretical foundations of hydrochemistry, study the chemical composition of natural waters, the factors for the formation of their chemical composition, to examine the characteristics and peculiarities of regional hydrochemistry. The main focus is to study the formation and modification of chemical composition and quality of surface and groundwater under the influence of natural and anthropogenic reasons. Students will learn about basic methods of hydrochemical analysis and hydrochemical research and monitoring of surface water quality. Will be discussed and the basic techniques, forms and policies to protect water resources from contamination.

The course is suitable for graduate students and students from area « Earth Sciences ».

LECTURER

Assoc. Prof. Marian Varbanov, PhD
Tel. (+359) 979-39-43
E-mail: marian.varbanov@gmail.com

ACADEMIC HOURS

25 lecture hours, 5 hours practical training

ECTS CREDITS

20 ECTS

6.2.8. ENVIRONMENTAL HAZARD ASSESSMENT AND HUMAN HEALTH CAUSED BY CHEMICAL COMPOSITION ATMOSPHERIC MODELLING

The main course objective is to give specific knowledge of chemical composition modelling in the atmosphere in the context of environmental hazard assessment and human health. The participants in this course will be able to get familiar with different methods use in chemical composition atmospheric modelling and basic processes responsible for air quality. Introduction with the basic equations and parameterizations use in this specific task is the minimum of knowledge that needed for air quality research, environmental hazard assessment and human health.

LECTURER

Prof. Kostadin Ganev, PhD
Tel. (+359) 9793307, 0887594305
E-mail: kganev@geophys.bas.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

6.2.9. INTRODUCTION TO THE MOST POPULAR MESO-SCALE SYSTEM OF THE ATMOSPHERIC DYNAMIC (WRF), THE AIR QUALITY (CMAQ) AND EMISSION MODELLING IN THE CONTEXT OF ENVIRONMENTAL HAZARD ASSESSMENT AND HUMAN HEALTH

The main course objective is to give the bases of the most popular system consists of three meso-scale models: of the atmospheric dynamics (Weather Research and Forecasting - WRF modelling system), of the air quality (Community Multiscale Air Quality Model - CMAQ) and emission modelling (Sparse Matrix Operator Kernel Emissions – SMOKE) and training to work with these models. The participants in this course will be able to gather knowledge of model's structure, the necessary input conditions and available data bases, model's configuration based on general physical parameters for model set up and different steps for model's run during the exercise. The practice will help learning basic commands working under Linux system and running in parallel environment for better adoption of the models (WRF, CMAQ, SMOKE) and gain skills working with different visualization tools (IDV, PAVE).

LECTURER

Assoc. Prof. Reneta Dimitrova, PhD
Tel. (+359) 9793328, 0898466610
E-mail: rdimitrova@geophys.bas.bg

ACADEMIC HOURS

15 lecture hours, 15 hours practical training

ECTS CREDITS

20 ECTS

6.2.10. ENVIRONMENTAL MAGNETISM

This course is intended for PhD students interested in past climate change, environmental protection and application of up-to-date geophysical methods in ecology. The course consists in two major parts – 1) utilization of magnetic signal in sediments and rocks for palaeoclimate reconstructions in geological past, and 2) application of magnetic properties of soils, sediments, urban dust and vegetation for evaluation of the degree of anthropogenic pollution of our environment.

Both parts are based on the well established link between concentration, grain size and other magnetic parameters of strongly magnetic minerals in different materials on one hand, and climatic factors and/or anthropogenic environmental pollution degree, on the other. The main themes of the course are: foundations of magnetism of solids; study of relations between magnetic signal and the environmental factors, determining the observed magnetic characteristics of the studied materials; characterization of the magnetic fraction in waste products of various anthropogenic products; theories about the link between palaeoclimate and the magnetism of palaeosols. Each of these themes will include both theoretical considerations and presentation of practical examples of the application of environmental magnetic methods for solving specific problems.

LECTURER

Assoc. Prof. Dr. Daniela Jordanova
Tel. (+359) 979 39 58
E-mail: neli_jordanova@hotmail.com

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

6.2.11. PALAEO- AND ARCHAEO-MAGNETISM

The course will be of interest for PhD students in Earth Sciences, studying different aspects of geological and tectonic evolution at regional level, palaeogeographical reconstructions and application of interdisciplinary methods in geology and archaeology.

Palaeo- and archaeomagnetism are methods widely applied in geology, geophysics and archaeology.

The main aim of palaeomagnetism is the reconstruction of geomagnetic field during historical and geological past. Only the data, provided by palaeomagnetic investigations serve as a basis for establishment of the theories for generation of the geomagnetic field (e.g. periods of variation, frequency of geomagnetic field inversions, etc.); resolving global geological problems like continental drift; investigation of the evolution and consecutive phases in different tectonic processes and movements at regional scale. Archaeomagnetic investigations use different materials of burnt clay from archaeological sites (pottery, ovens, kilns, etc.) and give information about the Declination, Inclination and Intensity of the ancient geomagnetic field during historical past. The available extensive archaeomagnetic data base for Bulgaria allows archaeomagnetic dating of different remains of burnt clay to be successfully done. The main subjects in the proposed course concern: basic rock magnetism; methods applied in palaeomagnetism; examples on the application of palaeo- and archaeomagnetis for solving different problems in geophysics, geology, geography, archaeology.

LECTURER

Assoc. Prof. Dr. Daniela Jordanova
Tel. (+359) 979 39 58
E-mail: neli_jordanova@hotmail.com

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS



1 INSTITUTE FOR BULGARIAN LANGUAGE

8.1.1. THE SLAVIC CYRILLIC BOOK IN THE GUTENBERG GALAXY DURING THE 15TH -16TH CENTURIES

The proposed course of lectures is addressed to PhD students who would like to enlarge their knowledge and specialize on the problems of the Medieval Bulgarian (South Slavonic) literature and language from the Ottoman times with special emphasis on the appearance of the first printed Cyrillic books for the Orthodox Slavic peoples.

LECTURER

Prof. DSc. Mariyana Tsibranska - Kostova

Тел. +(359) 872-23-02; 0877791754

E-mail: m.tsibranska@gmail.com

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

Its main trend is the linguistic and cultural studies of the 15th-16th cc. Cyrillic incunabula and palaeotypes and their relationship with the Medieval Slavonic written tradition. The concrete subjects of lectures are chosen in order to complete the obligatory minimum of knowledge about the literary production (textual repertory, text study, reception, original Slavonic works) and the phonetic, graphic, grammatical and lexical peculiarities of the Bulgarian literary language from the period. The cultural significance of the Slavonic printing as form and stage of information spread is also given priority. The basic competences to be acquired or fostered are as follows: ability of work with Medieval Slavonic texts in manuscript and printed form; comparison between texts which vary in chronology, localization and linguistic norms; work with catalogues and diachronic dictionaries; ability of detecting the main linguistic features of the text prototype and the subsequent changes it is charged with according to the cultural and linguistic environment; basic knowledge for description and identification of early printed Cyrillic books.



2 INSTITUTE FOR LITERATURE

8.2.1. TEXTUAL CRITICISM OF SLAVONIC MANUSCRIPTS

The course includes both basic and specialized knowledge in the discipline «Textual», and provides practical knowledge for changes in the texts as a result of their transcription in the X-eighteenth century and commenting on these changes in the history of the texts. Provides guidance for dating translated texts for their authorship, and to determine their content as literary monuments. Conclusions are drawn about the possibility of reconstruction of the text and follows the nature of nastapalite changes. The course aims to acquaint doctoral students with the principles of text-criticism and critical editions, and to give basic knowledge of terminology and the Slavic Textual.

LECTURER

Prof. DSc. Anisava Miltenova

Тел. +(359) 0886 617889

E-mail: amiltenova@gmail.com

ACADEMIC HOURS

15 lecture hours

ECTS CREDITS

20 ECTS



3 INSTITUTE FOR BALKAN STUDIES WITH CENTER FOR THRACOLOGY

8.3.1. CULTURAL POLICIES AND EDUCATIONAL REFORMS IN MODERN TURKEY

LECTURER

Assoc. Prof. Dr. Yordanka Bibina
Тел. +(359) 980 62 97
E-mail: yorybibina@gmail.com

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

The course is designed for historians, cultural anthropologists, researchers from other disciplines who are interested in the problems of management of cultural processes (cultural policy) and reforms in higher education caused by the challenges of globalization processes in general and in particular - in neighboring Turkey. The course creates the necessary basis for a possible comparison of educational and cultural policies in the Balkans, and Europe.

The aim is to introduce and familiarize doctoral students with the specifics of the socio-cultural processes in modern Turkey in the 20 century and early 21 century, which set up its complex and contradictory cultural identity. The kemalist reforms of Mustafa K. Atatürk are stressed and the cultural policy during the first decades of the Turkish Republic, which put the country into all new tracks and lead to rapid and radical modernization of all spheres of life are analyzed and discussed. Outlined is the special role of cultural policy, which is seen as a major factor in nation forming processes and transition from religious community of "umma" to a modern nation. However, in the longer time perspective those proved to be insufficient to finally lift of the main tensions between secular and religious foundations of the Turkish society especially separating its urban and rural segments, so in the years after World War II was also observed an entirely new dynamic in management culture, new developments in education, strengthening the impression of «retreat» from the revolutionary kemalist reforms of the previous period. Therefore, the changes of general course taken by the Turkish governments in the period after 1945, with particular emphasis on new developments since 1980 (after the military coup) and especially in the last 10 years.

6.3.2. CONTEMPORARY TURKISH LITERATURE (20TH –EARLY 21ST CENTURIES)

The course is designed for doctoral students in the field of literature, literary history, Balkan studies, and researchers in the field of Comparative Literature. The aim is to introduce doctoral students to the specifics of literary processes in Modern Turkey in the 20th century and early 21st century, which has its parallels in other Balkan countries, mainly due to the later development of contemporary genres, complex language reforms while imposing new literary norms of the language and strive for democratization of the old and heavy language of previous times, the influence of European literature and literary trends on both the formal and the content related elements in the Balkan literatures, strong folklore stream in them, relatively late development of the modernist currents, etc.

The development of modern Turkish literature from its inception in Tanzimat Era, Europeanization, the main currents in her aesthetic directions, leading authors in different periods and major works that form the visage of contemporary Turkish literature will be presented both on theoretical and practical levels. Knowing the literature of modern Turkey allows our better understanding and insight into the main features of the national psyche, aesthetic preferences, cultural orientations of the Turkish nation and its achievements in the field of literature that forms the notion of its place among the literatures of the modern world. Our days Turkish literature exists in a huge variety of works and authors - poets, writers, masters of the novel and short story. The wealth of its forms and appearances is impressive. During the course the student's attention will be drawn on similarities and differences between Turkish and other Balkan literatures, thus studying it from a comparative perspective. They will work and analyze different literary texts mainly in Bulgarian or English translation that are available at the libraries. Students will submit assignments and participate in seminars.

LECTURER

AAssoc. Prof. Dr. Yordanka Bibina
Тел. +(359) 980 62 97
E-mail: yorybibina@gmail.com

ACADEMIC HOURS

30 lecture hours, 10 hours practical training

ECTS CREDITS

20 ECTS



4

INSTITUTE FOR ETHNOLOGY AND FOLKLORE STUDIES WITH ETHNOGRAPHIC MUSEUM

8.4.1. CULTURAL POLICIES AND EDUCATIONAL REFORMS IN MODERN TURKEY

The PhD course reflects the folklore specifics of the traditional and the contemporary culture in the Balkan and Slavic regions. It is based on approved theoretical formulations and research methodologies, current for the contemporary folklore studies. Their representation in particular national, ethnical and religious contexts, reflecting the multicultural variety on the Balkans and among the Slavic world, would allow the construction of academic and research skills, necessary for the study of the dynamical social and cultural processes observed in the specified regions.

The course considers the main parameters of the so called folk culture and the processes of its development as well as among the traditional (pre-industrial), also in the modern and postmodern society. The programme is organized around few main topics: the Slavs as a meta-ethnic community and the main slavistic debates and research methodologies; the Balkan ethno-cultural communities and the function of folklore for the formation of Balkan identities (ethnic, national, and religious); folklore and religion (Christianity and Islam); urban folklore and contemporary folklore forms; socialist and post-socialist folklore. In this way we trace out the geography, the history and the dynamics of the folklore phenomena and the development of the Slavic and Balkan studies in relation to the sciences, which view as their main object the human and the society. The program helps the PhD students in the process of their developments as independent scientists, who master the contemporary scientific approaches for successful empirical and theoretical research within the field of the Slavic and Balkan studies.

LECTURER

Assoc. Prof. Ekaterina Anastasova, PhD, Irina Kolarska-Mladenova, PhD

Тел. +(359) 877 175 657

E-mail: ekaterina_anastasova@yahoo.com, irikol@abv.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

8.4.2. THE RITUAL IN THE TRADITIONAL CULTURE

The PhD course includes several subthemes organized in 30 hours lectures, presented from different lecturers: Ritual kinship and acquiring a new identity in traditional culture (4 hours, assoc. prof. E. Tsaneva, PhD); Bulgarian traditional wedding. Some theoretical aspects of the ritual (3 hours, assoc. prof. V. Zhekova, PhD); Funeral and commemoration (4 hours, assoc. prof. V. Vaseva, PhD); Donations in the rituals of the Bulgarians. (4 hours, assist. prof. G. Georgiev, PhD); Ritual construction of the religious identity (4 hours, assist. prof. E. Troeva-Grigorova, PhD); Food and nutrition in the traditional Bulgarian life cycle (birth, marriage, death) - 4 hours, assist. prof. M. Markova, PhD); Bulgarian traditional customs for rain. (4 hours, assoc. prof. V. Sharlanova, PhD); The ritual complex "nestinari"/anastenaria" (3 hours, prof. A. Anchev, Dr.Hab.).

LECTURER

Prof. Anatol Anchev, Dr.Sc.

Тел. +(359) 899 786 093

E-mail:

ACADEMIC HOURS

30 lecture hours,

ECTS CREDITS

20 ECTS

8.4.3. ETHNOLOGY OF SOCIALISM AND POST-SOCIALISM

The lecture course will present the main approaches, methods and categories, used in the ethnological research of socialism and post-socialism: the socialist and post-socialist societies as ethnological objects, basic theoretical paradigms; historiography, methodology of the ethnological research - qualitative and quantitative methods. Also, the basic aspects of the everyday culture of socialism and their transformation in the post-socialist period will be introduced: kinship and kinship relationships; family, marriage, gender construction, memory culture; labour culture; dynamic of the cultural and ethnical groups and identities: Jews, Greeks, Karakachans, Gagauzes, Bessarabian Bulgarians in Ukraine and Moldova. The course will be appropriate for the ethnology PhD students and also for those who study history, folklore, social anthropology, sociology, political sciences etc.

LECTURER

Assoc. Prof. Ana Luleva, PhD,
Tsvetana Boncheva, PhD

Tel. (+359) 888 714 608

E-mail: analuleva@gmail.com,
boncheva_tsvetana@abv.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

8.4.4. ETHNOLOGY OF THE BALKANS

The PhD course will present in generalized and summarized form the main parameters of the ethno-cultural heritage of the Balkan people and its contemporary dimensions. As bases of the course the fundamental conceptual notions and analytic ethnologic techniques will be outlined, which will lead to understanding of the processes, which are flowing among the different ethno-national, ethno religious and ethno cultural communities on the Balkans.

The PhD course gives the possibilities to receive knowledge about the main ethnologic parameters of the Balkan people, and the different kinds of communities in the "traditional", i.e. pre-industrial society, in the process of modernization and up till nowadays. As main, key themes are determined the issues of ethnicity, national, regional and community identities, the religious dimensions of the ethno-culture, the family-relative and social networks, migrations and mobility of the Balkan people, and their transition to modern and post-modern. This course is very significant for the establishment of new personal perspective of each PhD students, which helps for better orientation in our multicultural community, in the process of globalization. The course will be oriented towards the PhD students in ethnology, but together with that it will give fundamental knowledge, which can be used also for PhD students from wide range of other subjects in field of social sciences and humanities, and especially for history, folklore, and social anthropology, sociology, political sciences etc.

LECTURER

Assoc. Prof. Elena Marushiakova, PhD,
Yelis Erolova, PhD

Tel. (+359 2) 850 55 40

E-mail: studiiromani@geobiz.net,
kham@abv.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

8.4.5. GYPSIES/ROMA (HISTORY, TRADITIONS, MODERN TIMES)

The PhD course will present in generalized and summarized form the main parameters of the history and contemporary dimensions of the Gypsies (Roma and other communities) worldwide, with special stress on Bulgaria. The PhD course will present the origin and early history of the Gypsies, beginning of their migrations from the country of origin, their presence on the Balkans, migration to the Western Europe, their historical fate during the Middle ages, new migrations (19th and 20th centuries) and their contemporary distribution in various countries of the world.

The general structure of the heterogeneous Gypsy communities will be outlined and the main ethno-social subdivisions with their main ethno-cultural characteristics will be presented. The PhD students will be introduced to the different patterns of the state politics in regards to the Gypsies in history and nowadays, as well as to the Romani non-governmental sector. The contemporary attempts for construction of the "Roma Nation" will be presented and analyzed as well as the processes of searching of the new identities among part of the Gypsy communities. The course will be oriented towards the PhD students in ethnology, but together with that it will give knowledge, which can be used also for PhD students from wide range of other subjects in field of social sciences and humanities, and especially for history, folklore, and social anthropology, sociology, political sciences etc.

LECTURER

Assoc. Prof. Veselin Popov, PhD,
Magdalena Slavkova, PhD

Tel. (+359 2) 850 55 40

E-mail: studiiromani@geobiz.net,
magdalenaslavkova@yahoo.com

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

8.4.6. CALENDAR CUSTOMS OF BALKAN NATIONS

This course aim at introducing of students with basic festive-custom's cycles in the traditional folk calendar of Balkan nations. According to world outlook and custom's practices of all ethnic and confessional societies on the Balkans, folk calendar is a complex of two cycles and have divided to winter and summer seasons. A lot of folk proverbs from Bulgaria, Romania, Greece, Serbia and Bosnia, Albania testify about this. The economic year has organized in this way too as it main two holidays are Sveti Dimitar (St. Martin at Catholics; Kasam at Muslims) and Sveti Georgi (St. Yuraj at Catholics; Haderlez at Muslims). There can be outlined a set of isomorphous versions of this two season's year and economic division of the year which most often are marked by days of those Christian saints which have winter and summer celebration according to Christian calendar. Fundamental ethnographic sources in this problematic have been dated from the second half of XIX and the beginning of XX century.

LECTURER

Prof. Rachko Popov, Dr.Sc., Sofia
Zahova

Tel. (+359) 887603693

E-mail: balkan_ethnobj@yahoo.co.
uk, szahova@yahoo.com

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

8.4.7. FIELDWORK RESEARCH IN ANTHROPOLOGY: ANALYSES OF CASE STUDIES

The course is aimed at representing the anthropological problem field as reflected in fieldwork research. The acquisition of specific forms, methods and procedures of anthropological investigation will be achieved by way of reviewing specific cases referring to different ecological and social environments (established in the planes, mountains, littoral regions, villages, towns or diasporas).

Another important objective of the doctoral course is connected to gaining acquaintance about already finished or ongoing projects whose aim is the study of the cultural peculiarities of the specific ethnic or religious communities in Bulgaria, their migration and human mobility, the construction of their heritage and cultural identity, as well as the possible approaches to their study. The PhD students will build up their knowledge about the specifics of an anthropological fieldwork research and will have the ability to master the necessary theoretical tools for the problematization of fieldwork information. They will also gain practical skills for the documentation of cultural facts and phenomena. Depending on the topic and the preparation of the students involved in the doctoral course, some minor changes might occur or some new accents might be needed. Method of assessment: monitoring student activity during the seminar meetings and written assignments on specific topics.

LECTURER

Assoc. Prof. Valentina Ganeva-Raycheva, PhD

Tel. (+359 2) 979 30 11, +3592 828 39 25; +3598 98 79 22 85

E-mail: valrai@abv.bg

ACADEMIC HOURS

30 hours (theory- 10 hours; working seminar – 15 hours; self-study – 5 hours)

ECTS CREDITS

20 ECTS

8.4.8. ETHNICITY AND NATIONALISMS IN CONTEMPORARY WORLD

The course is aimed at representing the complex and ambiguous issues related to ethnos as a human community and as an ethnic entity. The content of the course includes and reflects the understandings of ethnicity and its problems in the recent years. The interpretation of the different ethnic communities and ethnic relations is focused at their instrumental and modern uses. The problems are related to nation and nationalism: i.e. the evolution of concepts, their inner essence, their roots and sources, as well as their transformation and dynamism.

The construction of personal and community identity through speech and religious ethic will be specially outlined. The palette of the ethnic groups in Bulgaria receives special attention as well. The problems are reviewed in Balkan and European contexts. Knowledge about interethnic and cultural contacts is offered, the processes of acculturation are given due attention, the situations of dialogue and lack of dialogue between the different ethnic communities are also introduced. During the classes the students will be offered information about specific research related to ethnicity, about the development of projects on these problems, about video and photographic documentation of cultural activities and about the peculiarities of the different communities. The emphases of the course can be changed depending on the specific topic and the capability of the doctoral students involved in the course. Method of assessment: monitoring student activity during the workshops and written assignment (coursework).

LECTURER

Assoc. Prof. Valentina Ganeva-Raycheva, PhD

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E-mail: valrai@abv.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

8.4.9. TRADITIONAL INSTITUTIONS AND NORMATIVE CULTURE ON THE BALKANS

The course of lectures is devoted to traditional folk institutions on the Balkans. Its aim is to introduce Ph.D. students to the strengthened principles of integration, forms of regulation and functional modes of those social and cultural communities in which everyday Balkan social and cultural life passes. The course is focused on the most important principles and traditional values for the relevant traditional culture such as: the principles of reproduction and inheritance, territorial and religious principle, principle of gender and age division, principles of profession and occupation for community foundation and the duplicating principle of the blood relationship: the principle of the ritual relationship for construction of alternative social structures.

Simultaneously these basic for the Balkan people social and cultural communities will be studied in their time and space dynamics: how much the traditional principles of integration and regulation of the social and cultural life are reproduced during the process of social mobility (migration) and in the conditions of modernisation in the modern Balkan national states; how much they determine the modern life strategies in the conditions of globalization; do these traditional institutions define the cultural identity of the different Balkan nations.

The complex approach and the variety of research strategies will be used in the study and interpretation of the traditional Balkan institutions and the forms of regulation. The course of lectures will help Ph. D. students not only of Ethnology, but of History, Sociology or Psychology to get a better understanding of the different ways to analyse the overall picture of Balkan social and cultural life.

LECTURER

Assoc. Prof. Petko Hristov, Ph.D., Mila Maeva, PhD

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ACADEMIC HOURS

30 hours

ECTS CREDITS

20 ECTS

8.4.10. MUSEUMS AND MUSEOLOGY

The objective of this class in Museology for PhD-students is to achieve advanced qualification and skills as museologists and museum professionals in museums in Bulgaria. The lectures will present to the PhD-students Museology as a scientific discipline; the basic concepts: museum, museum exhibit (musealia), museum exhibition, museum design and design of exhibiting.

It will present as well the work and functions of the museum, museum activities: museum collections and depositories; presentation of the museum treasures; museum communication; museum visitors and audience; museum pedagogical programmes; entertainment in museum; national and international law in the preservation of tangible and intangible cultural heritage; contemporary trends in museology and in the activities of Bulgarian museums. The course will present also the genesis and development of museum abroad and in Bulgaria.

TOPICS:

1. Genesis and historical background of Museum
2. Museology – a new scientific discipline: history, theory, methodology
3. Museum functions, basic and specific functions of museums
4. Museums in Bulgaria – since the national Revival up to the present day
5. The museum exhibit/item
6. Museum collections, museum depositories. Museum specializations
7. Museum exposition – types; general principles of display
8. Museum exposition and design
9. Museum communication. The museum and its audience. Cultural tourism
10. Museum pedagogical programmes. Entertainment in the museum
11. Museum and space – museum building, architecture
12. Preservation of museum collections – international and national law
13. Museum and High-techs – real and virtual museum
14. Contemporary trends in the development of museums

LECTURER

Assoc. prof. PhD Svetla Rumenova Rakshieva

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ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS



5 SCIENTIFIC CENTER FOR CYRILLO-METHODIAN STUDIES

8.5.1. CLAVIS TEMPORUM - THE HISTORICAL CHRONOLOGY IN MEDIEVAL EUROPE

The course presents the historical chronology from Late Antiquity to the Late Middle Ages through its philosophical and cultural-historical dimensions. They are traced through the different phenomena of medieval culture - monuments of archaeology, epigraphics, palaeography, and diplomatics; the Christian services of worship and the church holy days; the works of the Church Fathers and the works on historiography.

The scale of time in Medieval Bulgaria and the monuments which determine it are the object of special attention during the parallel discussion of the Western and Eastern chronological systems and their concrete expression.

LECTURER

Assoc. Prof. Slavia Barlieva
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E-mail: barlieva@bas.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

8.5.2. GRAPHIC CULTURE OF THE MIDDLE AGES IN WESTERN EUROPE

The course is part of the programme of training in Latin medieval studies and traces the development of Latin graphic culture from its beginning to the epoch of the first printed books. The peculiarities of the different kinds of script are discussed as graphic-artistic phenomena, which are important elements of the cultural history of Europe. The students are made familiar with the terminology and the methods of palaeography and its connection with related subjects such as diplomatics, codicology, textual criticism, and chronology. The seminar exercises have as their aim to develop practical skills to decipher and date medieval Latin MSS. As a whole the classes provide a basis for future independent work with medieval written monuments and on archival studies.

LECTURER

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E-mail: barlieva@bas.bg

ACADEMIC HOURS

15 lecture hours, 15 training hours,

ECTS CREDITS

20 ECTS

8.5.3. OLD BULGARIAN HAGIOGRAPHY

The purpose of the course is to provide elementary knowledge on Christian hagio-logy and hagiography and to make those attending the lectures familiar with the history and the specific features of Old Bulgarian hagiography. By means of the literary works on the saints (chiefly vitae and narratives about relics and miracles), the cultus of the saints will be presented as one of the most important phenomena typical of mediaeval literature and culture. The course will point to its functions and interaction with traditional (pagan) customs and beliefs and will present the typology of Christian sanctity.

Early Bulgarian hagiology and hagiography will be discussed on the background of the social-and-political situation in Bulgaria from the end of the 9th to the end of the 12th centuries. It will lay stress on the cultus of the first teachers of the Slavs and their disciples and of the anchorites in Western Bulgaria. The course will present also the character of the phenomena in the Second Bulgarian state - the new saints in the capital during the 13th century, hesychasm, and the conceptual literary changes in the genre of vitae and panegyrics during the 14th century as well as the hagiographic model in the work of Patriarch Euthymius and his followers. The problem of the preservation of the traditional cultural model within the context of another religious culture will be analysed as a fundamental feature of the hagiography of the Ottoman period.

The course can be read also in Polish.

LECTURER

Assoc. Prof. Ana Stoykova

Tel.

E-mail:

ACADEMIC HOURS

30 hours

ECTS CREDITS

20 ECTS



1 INSTITUTE FOR POPULATION AND HUMAN STUDIES

9.1.1. PSYCHOLOGY IN THE POLITICS OR THE POLITICS AS A FUNCTION OF THE PSYCHOLOGICAL

The selected topics in the course “Psychology in the politics or the politics as a function of the psychological” have two basic aims: 1. to present the general theoretical frame of political psychology as interdisciplinary field of knowledge; and 2. to extend learning about some psychological mechanisms related to the interpretations on political events. Political psychology is a new, more specified knowledge in the educational system for social sciences not only in our country, but and in the countries where this knowledge is created and systematized earlier.

It involves a lot of specific theories and relations not presented in the disciplines studying politics. The knowledge of psychological points of interpretation helps to be more precise in understanding of explanation mechanisms in own practice for PhD students. The topics are ranged over a large number of problems starting from political leadership, across – attitude management, to psychology of terrorism. The course is referring to PhD students in psychology, political science, philosophy, sociology and other social sciences.

LECTURER

Assoc. Prof. Antoinette Hristova, PhD
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E-mail: tony@tir.ttm.bg

ACADEMIC HOURS

30 lecture hours

ECTS CREDITS

20 ECTS

9.1.2. ETHNIC AND CULTURAL VARIETY IN THE BALKANS AND IN BULGARIA

This course' objective is to present the ethnic, religious and linguistic variety in the Balkans (and Bulgaria) as a special region's wealth. The region's specific models of ethnic and religious co-existence and tolerance are studied, but also the role of the cultural differences for the social stratification and inequalities, conflicts and social exclusion. The course includes 10 themes to be presented in 30 teaching hours.

LECTURER

Prof. Ilona Tomova, PhD
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E-mail: ilonai2000@yahoo.com

ACADEMIC HOURS

30 lecture hours,

ECTS CREDITS

20 ECTS