

# KAZIMIERZ WIELKI UNIVERSITY IN BYDGOSZCZ

Scientific and research offer





**PUBLIC UNIVERSITY**

- SCIENCE FOR SOCIETY AND ECONOMY



As the largest university in Bydgoszcz, the Kazimierz Wielki University pursues the mission of a key research and teaching partner in the development of the city and region, providing the knowledge of facts, values and methods of operation in solving the most important problems of social and economic life and in efforts to improve the quality of life of the inhabitants. As a classical university with a broad range of programs, UKW efficiently combines research in science and technology, health and earth sciences as well as social sciences, humanities and music. This results not only in a high research and teaching capacity, but also in unprecedented possibilities for comprehensive support of business and social partners and for the creative resolution of their problems on the basis of the most recent scientific achievements. The potential of our university is proved by numerous awards and diplomas obtained in the last year only.

We hope that this folder with UKW's offer of economic and social cooperation encourages you to get in contact with our R&D and teaching teams, also in order to jointly implement new ideas not yet included in this folder, and UKW's offer of commercialisation of research results will be continuously expanded for mutual benefit.

We invite you to cooperate with us!

**Vice-Rector for Development and Cooperation**

*Marek Mackay, Ph. D., D. Sc., Eng., Associate Professor*

## **Centre for Technology Transfer and Innovation of the Kazimierz Wielki University in Bydgoszcz**

UKW's Centre for Technology Transfer and Innovation (CTTI UKW) is the first and basic contact point for representatives of the University's social and economic environment who want to establish cooperation with scientific teams operating within the framework of UKW. CTTI is proactive in commercialising the results of scientific research and development works, which is also reflected in initiating cooperation between UKW's scientific community and its social and economic environment, as well as in carrying out tasks that may lead to the application of the results of such research and work in specific market solutions. The primary 'internal' objective of CTTI is to analyse the University's technical and intellectual potential and to develop opportunities for its students and staff to make better use of it. As regards the fulfilment of 'external' objectives, CTTI coordinates the commercialisation of the results of the University's research and development activities in accordance with the rules laid down in the applicable Intellectual Property Regulations and Commercialisation Rules, in particular through:

- monitoring the offer of scientific and commercial cooperation of the University's units for companies and other external entities,
- making research results available to third parties against payment, including through licensing,
- transfer of rights to third parties, against payment or free of charge,
- establishment or accession to special purpose vehicles, the purpose of which will be the commercialisation of intangible assets.

In order to efficiently carry out the above tasks, each task is assigned an innovation broker who provides comprehensive support and information exchange between the entrepreneur and the research team. Process routes developed in individual cases facilitate quick and efficient implementation of tasks within the framework of the cooperation.

The website of CTTI UKW,

**[http://www.innowacje.ukw.edu.pl/jednostka/centrum\\_transferu\\_tehnologii](http://www.innowacje.ukw.edu.pl/jednostka/centrum_transferu_tehnologii),**

lists current cooperation offers, CTTI Newsletter and contacts to innovation brokers.

### **Centre for Technology Transfer and Innovation ul. Chodkiewicza 30, 85-064 Bydgoszcz**

Head of the Centre for Technology Transfer and Innovation

Dariusz Mikołajewski, Ph. D., Eng.

Phone 725 889 909, (52) 34 19 137

e-mail: dmikolaj@ukw.edu.pl, innowacje@ukw.edu.pl

The activities of CTTI UKW are administratively supported  
by the Department of Social and Economic Cooperation.

A special purpose vehicle also operates for the commercialisation  
of the results of scientific research conducted at UKW. Akademicki Inkubator Przedsiębiorczości  
Uniwersytetu Kazimierza Wielkiego sp. z o.o.

Dariusz Mikołajewski, Ph. D., Eng.

Phone 725 889 909

e-mail: darek.mikolajewski@wp.pl

aipukwb@gmail.com

Vice President Monika Łaganowska, MSc

Phone: 722 250 401

e-mail: mlaganow@ukw.edu.pl



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**Elaboration:** Pion Prorektora ds. Rozwoju i Współpracy

**Photos:** Andrzej Obiała, Mateusz Łaganowski, Marcin Kwaśniewski



# **FACULTY OF MATHEMATICS, PHYSICS AND TECHNICAL SCIENCES**

[www.naukiscisle.ukw.edu.pl](http://www.naukiscisle.ukw.edu.pl)



## The Authorities

### Dean

Grzegorz Domek, Ph. D., D. Sc., Eng.,  
Associate Professor

### Associate Dean for Scientific Research

Mieczysław Cieszek, Ph. D., D. Sc., Eng.,  
Associate Professor

### Associate Dean for Teaching

Katarzyna Chmielewska, Ph. D.

## Contact Information



ul. Ogińskiego 16,  
85-092 Bydgoszcz



52 32 36 740



wmfit@ukw.edu.pl



[www.naukiscisle.ukw.edu.pl](http://www.naukiscisle.ukw.edu.pl)

## Faculty Structure

- Institute of Physics
- Institute of Mathematics
- Institute of Mechanics  
and Applied Computer Science
- Institute of Technical Science

## Brief Description of the Faculty

**The Faculty of Mathematics, Physics and Technical Science is an organisational unit of the University which aims at providing comprehensive education to students and conducting scientific research at the highest level in the field of science and technology in cooperation with the social and economic environment.**

The Faculty conducts studies in eight areas: occupational health and safety, technical and IT engineering, physics, information technology, safety engineering, material engineering, mathematics and mechatronics. Additionally, on the basis of a decision issued in 2009 by the Central Commission for Degrees and Titles, the Faculty is authorised to award the degree of doctor of technical sciences in the field of mechanics.

A broad scientific and didactic approach allows the Faculty's students to acquire, apart from reliable substantive knowledge and practical skills, also comprehensive competencies aimed at further narrow-specialist education indispensable on the labour market of industrial branches. This is fostered by the development of new and better curricula, constant care for the appropriate technological level of the equipment base and cooperation with business entities.

The spectrum of research conducted in the Faculty is multidisciplinary: from classical mathematical theories to interdisciplinary research aimed at developing innovative solutions for the economy and industry. Scientific work at the Institute of Physics includes research on the development and application of quantum mechanics calculation methods. Calculation of the electronic and magnetic structure of crystals using the methods based on the density functional theory (DFT), allow to broaden the knowledge of the properties of the crystals or molecules studied. Current conductivity, optical, photovoltaic and magnetic properties are analysed. In addition, advanced research and engineering works at the world scientific level on the synthesis of modern luminescent materials in the form of monocrystalline layers of complex oxides by liquid phase epitaxis (LPE method) are carried out. Another







main research trend of the Institute is research on the development of gas-phase diamond synthesis techniques in metastable conditions, i.e. at low pressure and temperature using CVD (Chemical Vapour Deposition) methods.

The Institute of Mathematics conducts research in various disciplines of mathematics and related sciences, including analysis, topology, algebra, geometry, financial mathematics, didactics of mathematics and ap-

plications of mathematics in physics. The unit effectively employs a real-life analysis team that studies the structures of regular, algebraic and topological representation theories and generalised types of continuity and differentiability.

The Institute of Mechanics and Applied Computer Science conducts basic and applied research in the field of mechanics, mechatronics and information technology, as well as interdisciplinary research related to the above-mentioned areas. Porous material mechanics and biomechanics are the dominant research areas. In the field of mechatronics, innovative solutions are being sought that improve the functioning of shred-



ders and the design and simulation of micro-electronic systems. New scientific solutions in the field of reverse engineering and implementation of 3D printing technologies in tech-



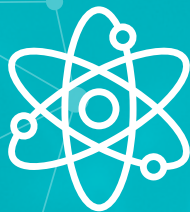
nical and medical applications are being initiated. Scientific interests in the field of computer science include mainly advanced use of databases and methods of artificial intelligence, programming, networks and ICT systems.

The laboratories of the Institute of Technical Science carry out scientific research in the field of material engineering, which belongs to the most modern and dynamically developing areas of the science of polymers and methods of their modification. Scientific works in the field of wood processing are also carried out – material tests, including wood-polymer composites (WPC) and tests of wooden structures. Metallurgy, crack mechanics and the selection and

evaluation of construction materials and tools are also important areas of interest.

The organisational units of the Faculty of Mathematics, Physics and Technology show significant scientific potential and a high level of innovation resulting both from the implementation of scientific research works and from patent activity.

The Faculty deals with the implementation of innovative projects and deepening cooperation with foreign countries, as well as widely understood business practice. For many years, the Faculty's employees have been carrying out studies and commissioned works, expert opinions, and substantive consultations for external entities.



# INSTITUTE OF PHYSICS

[www.fizyka.ukw.edu.pl](http://www.fizyka.ukw.edu.pl)



## The Authorities

Prof. Kazimierz Fabisiak, Ph. D., D. Sc.

## Contact Information



ul. Powstańców Wielkopolskich 2,  
85-090 Bydgoszcz



52 32 16 191



fizyka@ukw.edu.pl



[www.fizyka.ukw.edu.pl](http://www.fizyka.ukw.edu.pl)

## Structure

- Department of Theoretical Physics and Computer Science
- Department of Optoelectronic Materials
- Department of Carbon Radiospectroscopy and Carbon Physics



### Scientific and research issues:

The staff of the Institute of Physics focuses on the following topics in its research work:

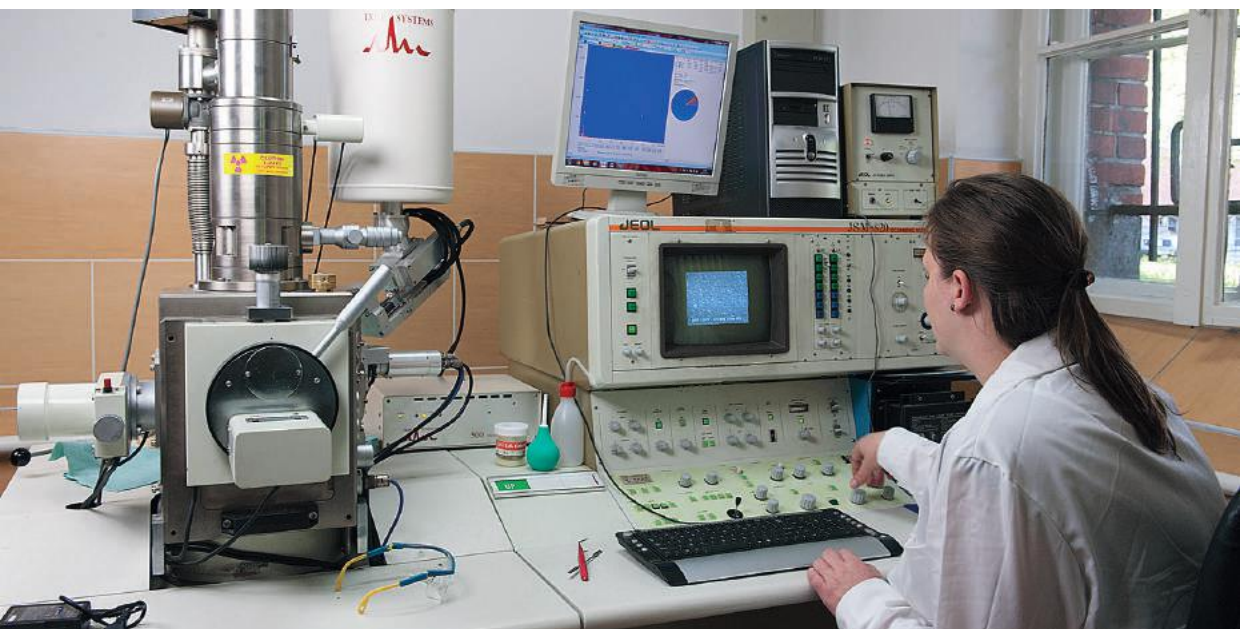
- development of experimental methods to investigate material properties using methods generally applied in solid state physics and modern material engineering,
- study of structural and luminescent properties of selected oxide compounds, in particular complex garnates A<sub>3</sub>B<sub>5</sub>O<sub>12</sub> (A=Lu, Y, Gd; B=Al, Sc, Ga), crystallised in the form of monocrystalline layers by the liquid epitaxy method (LPE growth) – the research is aimed at synthesis of new scintillation screens for visualisation of images in the form of thin monocrystalline layers of oxide materials with high X-ray absorption capacity,
- development of research on the applicability of micro and nanodiamond layers produced by gaseous phase synthesis for the construction of bio- and chemosensors and their construction in SGFET (Solution Gated Field Effect Transistor) configuration,
- development of research on the possibilities of constructing small-scale dosimeters, expected by environments related to the use of radiotherapy in cancer treatment and improvement of life comfort of terminally ill people,
- testing the possibilities of constructing on the basis of diamond layers of active dosimeter, i.e. ionization chamber.

### The following research laboratories operate at the Institute:

- X-Ray Diffraction Laboratory,
- Laboratory of Thin Layer Technologies,
- Laboratory of Luminescent Materials,
- Laboratory of Electron Microscopy,
- Laboratory of Electrical Measurements,
- Laboratory for the Synthesis of Thin Diamond Layers,
- Laboratory of Optical Spectroscopy.

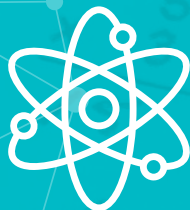
## Laboratory of Luminescent Materials

The Laboratory's team of scientists conducts advanced research and engineering works at the world scientific level on the synthesis of modern luminescent materials in the form of monocrystalline layers of complex oxides.



## SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	<p>RESEARCH SERVICES, SCIENTIFIC COOPERATION FOR:</p> <ul style="list-style-type: none"> <li>• electronic industry related to the production of scintillation counters, fluorescent, oscilloscopic and fluorescent lamps,</li> <li>• chemical industry related to the production of paints and phosphorous compounds as well as chemical light sources,</li> <li>• the mining industry, which is concerned with the prospection of minerals and their deposits in field conditions.</li> </ul>
<b>Research services</b>	<p>THE APPLICATION OF PROBLEMATIC ASPECTS OF RESEARCH IN PRACTICE INCLUDES:</p> <ul style="list-style-type: none"> <li>• structural studies of materials using X-ray diffraction,</li> <li>• phase composition examination using EDS spectroscopy,</li> <li>• measurements of electrical and optical properties of modern electronic, thermoelectric, luminescent and dosimetric materials,</li> <li>• tests using scanning electron microscopy (SEM),</li> <li>• tests using Raman spectroscopy.</li> </ul>
<b>Apparatus, testing equipment</b>	<ul style="list-style-type: none"> <li>• NP-501PA sputter coater equipped with an electron gun – evaporation of layers of high-melting materials (titanium),</li> <li>• NP 380 sputter coater – gold and aluminium layers,</li> <li>• Jeol sputter coater for applying carbon layers (optionally metallic layers – Au),</li> <li>• DEKTAK 1 profilograph by Sloan together with the Sloan DEKTAK FLM module, a system for digitizing the reading,</li> <li>• optical microscope, type: Jenatech Inspection,</li> <li>• Raman Jobin-Yvon U1000 spectrometer,</li> <li>• Jeol electronic scanning microscope type JSM-820 (LaB6 cathode),</li> <li>• EDL-type XRF Systems 500 – Eumex: sphinX 133 JSM 820,</li> <li>• Stelarnet's Silver Nova module with CCD camera for cathodoluminescent measurements,</li> <li>• computerised system for dip coating,</li> <li>• Polos Spin150i (spin coating) organic layer synthesis station,</li> <li>• system for vacuum vapour deposition of organic layer using quasi MBE methods based on the B30.2 95.26 VEB Hochvacuum Dresden vacuum system.</li> </ul>



# INSTITUTE OF MATHEMATICS

[www.matematyka.ukw.edu.pl](http://www.matematyka.ukw.edu.pl)



## The Authorities

Andrzej Prószyński, Ph. D., D. Sc., Associate Professor

## Contact Information



Pl. Weyssenhoffa 11,  
85-072 Bydgoszcz



52 34 19 001



[imath@ukw.edu.pl](mailto:imath@ukw.edu.pl)



[www.matematyka.ukw.edu.pl](http://www.matematyka.ukw.edu.pl)

## Structure

- Department of Mathematical Analysis
- Department of Algebra and Mathematics Didactics
- Department of Computer Science
- Department of Topology

**Scientific and research issues:**

The Institute conducts research in various disciplines of mathematics and related sciences, including analysis, topology, algebra, geometry, financial mathematics, didactics of mathematics and applications of mathematics. Throughout the Institute's existence, a specialist team of actual analysis has been working. Within this group, the structures of regular, algebraic and topological representational theories, general types of continuity and differentiability, as well as the general theory of integrals are studied, with particular emphasis on Henstock-Kurzweil's integrals. Moreover, research topics in the field of number theory and the shaping and application of mathematical skills in human and machine contexts (mathability) are conducted with great success.



## Department of Mathematical Analysis

**The priority research topics are as follows:**

- measurable, algebraic and topological structures in the theory of representation,
- generalised types of continuity and differentiation,
- generalised theory of integrals, including Henstock-Kurzweil's integrals,
- financial mathematics,
- applications of mathematics,
- teaching of mathematics and science supported by information and communication technology.

### SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	RESEARCH SERVICES IN THE FIELD OF MODELLING, ANALYSIS AND IMPROVEMENT OF BUSINESS PROCESSES IN THE AREAS OF IT, E-COMMERCE, ANALYTICS AND FOR THE NEEDS OF EDUCATION.
<b>Research services</b>	<ul style="list-style-type: none"> <li>• mathematical modelling of technological, economic and other processes,</li> <li>• analysis of experimental data and mathematical modelling extended with a detailed description of the model, conclusions and recommendations,</li> <li>• assessment of the innovativeness of mathematical models and curricula.</li> </ul>
<b>Training and consulting services</b>	TRAINING IN APPLICATIONS OF: <ul style="list-style-type: none"> <li>• computational applications, support of the learning process with modern technology,</li> <li>• specialised software (e.g. Mathematica, Matlab, R) in mathematical modelling.</li> </ul>

# Department of Algebra and Mathematics Didactics

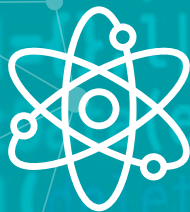
## Areas of interest are:

- mathematical education supported by modern technologies (Mathability),
- coaching in education,
- methods of working with a talented student.

## SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	<p>SERVICES RELATED TO THE EDUCATION OF SCIENCE SUBJECTS USING MODERN TECHNOLOGIES. IN PARTICULAR, THE FOLLOWING CAN BE DISTINGUISHED:</p> <ul style="list-style-type: none"> <li>• services related to the education of science subjects using modern technologies. In particular, the following can be distinguished:</li> <li>• remote work and teaching using virtual drives and a VR environment that fosters cooperation in complex project teams,</li> <li>• popular methods and techniques of tutoring, mentoring and coaching in education. The scope of cooperation includes both the presentation, implementation and testing of the effectiveness of the analysed methods.</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• evaluation of innovativeness and support for the creation of original educational programmes,</li> <li>• testing the effectiveness of the implemented training methods, including the evaluation of the effectiveness of methods and techniques of coaching, tutoring, etc.,</li> <li>• other pedagogical research in the field of science,</li> <li>• the use of three-dimensional on-line collaboration environments.</li> </ul>
<b>Training and consulting services</b>	<p>TEACHER TRAINING COURSES:</p> <ul style="list-style-type: none"> <li>• supplementing the qualifications in the field of mathematics didactics in grades VII and VIII of primary school,</li> <li>• basics of statistics and methodology of pedagogical research;</li> </ul> <p>WORKSHOPS AND TRAINING ACTIVITIES:</p> <ul style="list-style-type: none"> <li>• modern technology in science education,</li> <li>• modern technology as a tool of teacher's work,</li> <li>• building three-dimensional didactic cooperation environments,</li> <li>• VR in education.</li> </ul>
<b>Apparatus, testing equipment</b>	<ul style="list-style-type: none"> <li>• computer hardware and software, including: Mathematica, Statistica, MaxWhere, development environments.</li> </ul>





# **INSTITUTE OF MECHANICS AND APPLIED COMPUTER SCIENCE**

[www.imis.ukw.edu.pl](http://www.imis.ukw.edu.pl)





## The Authorities

Prof. Mariusz Kaczmarek, Ph. D., D. Sc. Eng.

## Contact Information



ul. Kopernika 1,  
85-074 Bydgoszcz



52 32 57 612



imis@ukw.edu.pl



www.imis.ukw.edu.pl

## Structure

- Department of Biomechanics and Experimental Mechanics
- Department of Porous Materials Mechanics
- Department of Mechatronics
- Department of Databases and Computational Intelligence Systems
- Department of Information and Communication Technology

**Scientific and research issues:**

The research topics of the Institute include mechanics, computer science, mechanical engineering, mechatronics and bio-cybernetics. Models and simulations of related physical processes in materials are being developed. Experimental studies of material structures and properties are carried out, as well as design work for reverse engineering and the manufacture of diagnostic equipment.

The model works focus on porous natural materials (tissues, rocks, clays, wood) and technical materials (concretes, composites, sinters, glass, gels, lubricants) as well as designing of new materials.

This concerns the mathematical description of the structure, the processes of transport (mass, momentum and energy) and the phenomena of friction and propagation of waves, as well as their numerical modelling. Models of wave propagation and interaction are used as tools for diagnostics, identification of structure parameters and material constants. Work is also underway to develop the basis for the theoretical interpretation of clinical results of hydromechanical tissue tests, hydrogeological tests and laboratory measurement methods. In experimental research, methods are used to identify micro and macroparameters of pore space structure and mechanical properties of technical materials, tissues, composites and lubricants, as well as materials whose properties evolve under the influence of external loads and factors. Such studies are carried out using wavelength methods (backward scattering, reflectometry, surface waves, plate and amplitude spectra), indentation methods (tonometry, chamber techniques), flow methods (gas and liquid permeability) and the mercury porosity method. Techniques of determination of mass diffusion and sorption coefficients as well as methods of chemomechanical parameters estimation in reactive materials are also used.

The design works concern new materials and constructions produced with the use of 3D printing method (for technical purposes, rehabilitation, education) and construction of test stands for diagnostic purposes in technology (material quality assessment, detection of defects) and medicine (bone and soft tissue diagnostics).

Within the scope of IT research, algorithms, models and programs are developed using modern methods of computational intelligence, artificial neural networks and genetic algorithms, methods of fuzzy logic and directed fuzzy numbers, as well as advanced methods of signal processing, optimization and modelling of physical and technical processes. This includes modelling of signals and production, biological, biomedical (neuromedical) and acoustic processes for the purpose of parameterisation, classification or creation of databases or knowledge bases.

## Department of Biomechanics and Experimental Mechanics

The Department of Biomechanics and Experimental Mechanics conducts the following research:

- the development of experimental methods for the study of material properties,
- using vibration and wave techniques, gas and liquid flows, tank-column methods, the use of relaxation and creep phenomena,
- carrying out tests of mechanical and structural properties, heat and mass transport for porous materials,
- development of methods of diagnosis and monitoring of biological and technical materials,
- modelling and simulation of porous materials,
- testing of tribological properties of engineering bearings and biotribological natural surfaces and testing of lubricating properties of oils and other lubricants.

### SCIENTIFIC RESEARCH PROSPECTS

#### Business cooperation offer

RESEARCH SERVICES, MEASUREMENTS, SCIENTIFIC COOPERATION FOR:

- health care units,
- furniture industry,
- construction industry,
- other industries using porous materials.

<b>Research services</b>	<ul style="list-style-type: none"> <li>• ultrasonic testing of materials,</li> <li>• ultrasonic testing of structural components,</li> <li>• identification of mechanical and structural parameters and the depth of degradation,</li> <li>• measurement of mechanical properties of susceptible materials and tissues,</li> <li>• measurements of permeability and twistability of porous materials,</li> <li>• measurements of the diffusion and sorption coefficient of susceptible materials,</li> <li>• measurements of thermal properties,</li> <li>• viscosity measurement of liquids and mixtures,</li> <li>• diagnostic measurements of soft tissues,</li> <li>• measurement of lubricating properties, selection of lubricants,</li> <li>• development of technologies for production of plain bearings and construction of simple devices for tribological properties measurement.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• TOFD, UT1, UT2 courses,</li> <li>• training in the basics of ultrasound diagnostics (ultrasonography).</li> </ul>
<b>Apparatus, testing equipment</b>	<ul style="list-style-type: none"> <li>• ultrasonic laboratory and diagnostic apparatus for contacting, dipping and non-contacting tests; ultrasonic scanners; apparatus for testing susceptible materials and tissues; apparatus for measuring the structural, thermal and solid characteristics and viscosity of liquids.</li> </ul>

## Department of Porous Materials Mechanics

### Scientific and research issues:

The Department of Porous Materials Mechanics conducts research and development works in the field of:

- identification and analysis of the microscopic structure of materials,
- analysis of geometric characteristics of bulk materials,
- analysis of the dependence of physical properties of porous materials on the characteristics of their internal structure,
- analysis of the technology of porous materials manufacturing processes in terms of shaping the desired internal structure co-determining their macroscopic physical properties,
- modelling and simulation of processes of flow and propagation of waves in porous materials with isotropic and anisotropic structure of pore space,
- modelling and simulation of wave propagation in heterogeneous materials,
- modelling and simulation of quasi-static, stationary and dynamic capillary transport processes in unsaturated porous materials,
- identification of the location of objects in the near-surface ground layer by means of resistance tomography or radar waves.

### SCIENTIFIC RESEARCH PROSPECTS

#### Business cooperation offer

RESEARCH SERVICES, MEASUREMENTS, SCIENTIFIC COOPERATION FOR:

- construction industry,
- other industries using porous and bulk materials.

<b>Research services</b>	<ul style="list-style-type: none"> <li>• computed microtomography (<math>\mu</math>CT) to identify the three-dimensional internal geometry of porous materials,</li> <li>• morphological analysis of 3D microtomographic images for determining volumetric distributions of pore dimensions and dimension distributions of skeleton elements, determination of morphological parameters of internal structure of materials. Determination of volumetric and surface porosity, pore tortuosity, skeleton tortuosity. Determination of physical properties of materials with complex internal structure in a computer simulation mode of processes, e.g. permeability, electrical conductivity, thermal conductivity. Identification of parameters of porous materials with anisotropic pore space structure. Comparative analysis of internal structure of materials,</li> <li>• mercury porosimetry and pycnometry. Determination of porous material pore structure parameters: volume pore size distributions (from 3 nm to 0.3 mm), volume porosity and other parameters of pore structure, apparent and actual density.</li> </ul>
<b>Apparatus, testing equipment</b>	<ul style="list-style-type: none"> <li>• computer microtomograph (<math>\mu</math>CT),</li> <li>• mercury porosimeter (MP),</li> <li>• gas pycnometer (GP).</li> </ul>

## Department of Mechatronics

### Scientific and research issues:

The Mechatronics Department conducts research and development works in the field of:

- research on the processes of shredding polymeric materials and plant-based materials,
- improvements in the design of shredders,
- evaluation of the effectiveness of the shredding process (identification of the properties of mechanical structures, determination of the characteristics of technological processes, load characteristics, etc.),
- evaluation of the quality of the grinding product,
- implementation of 3D printing technologies in technical and medical applications,
- development of methods and the application of techniques for the scanning of spatial objects,
- design, modelling and simulation of microelectronic systems, PIC, TFBAR and RFMEMS systems using analytical and numerical methods,
- magnetostatic analysis of machines and electric drives,
- study the possibility of using GPU cards and GPU-based systems for mechatronics, Internet of Things (IoT), and 5G wireless communications.

There are two specialized laboratories operating within the Unit:

- Advanced Shredding Laboratory,
- Reverse Engineering Laboratory.

As part of the studies of the research team of the Institute of Mechanics and Applied Computer Science, at the **Reverse Engineering Laboratory**, a project was created under the name: „Development of a concept and implementation of an innovative method of production of artificial organs, based on anatomical features of the patient”.

The aim of the project is to develop a concept and implement an innovative method of manufacturing artificial organs that provide material that imitates the physical and mechanical properties of human organs. These organs are a new product, a training material that will replace animal organs or low-quality plastic organs.

Artificial organs have properties similar to those of real organs.

This concept allowed for the introduction of a new service, including training and workshops in urology, while maintaining conditions similar to those of the actual surgery during surgery and conducting so-called pre-operations in order to better prepare surgeons for conducting complex operations.

This project was awarded the „Innovative Brand of the InnoMaRe Region” certificate. Made in Kujawsko-Pomorskie”.

## SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	<p>RESEARCH SERVICES FOR:</p> <ul style="list-style-type: none"> <li>• business (services and production),</li> <li>• representatives of medical circles;</li> </ul> <p>POTENTIAL APPLICATION OF THE RESEARCH:</p> <ul style="list-style-type: none"> <li>• processing of polymeric materials and food products (cereal grains, oilseeds) in the scope of shredding,</li> <li>• processing of polymeric materials – in the scope of technical prototyping of injection moulds and mould inserts,</li> <li>• medical prototyping for the design and manufacture of prostheses, exoskeletons, human organs and organs for training and so-called pre-operations.</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• analysis of the shredding product,</li> <li>• determining the efficiency of the shredding process,</li> <li>• analysis of shape and geometric features of a shape with a complicated surface,</li> <li>• selection and implementation of appropriate additive technology.</li> </ul>
<b>Training and consulting services</b>	<p>TRAINING SERVICES IN THE FIELD OF:</p> <ul style="list-style-type: none"> <li>• modern 3D printing technologies and 3D scanning,</li> <li>• open source software for the design of electromechanical systems.</li> </ul>
<b>Apparatus, testing equipment</b>	<ul style="list-style-type: none"> <li>• shredding system for polymers and plant products with the possibility of implementing various shredding chamber construction systems with full process monitoring,</li> <li>• Hioki 3961 power quality analyser for monitoring energy performance,</li> <li>• „Spider” data acquisition system for the torque and force measurement from Hottinger Baldwin Messtechnik GmbH together with Catman application,</li> <li>• Analyzette particle size sieve analyser with RETSCH DIN-ISO 3310/1 measuring sieve kit,</li> <li>• Gaja 3D Multitool set of printers working in FDM technology - 3D printing of polymers, semi-solid masses, clay,</li> <li>• Objet 30 pro printer – Polyjet 3D printing technology,</li> <li>• Nobel 1.0 printer – 3D SLA printing technology,</li> <li>• NextEngine 3D scanner,</li> <li>• XYZ Printing scanner,</li> <li>• a set of scanners according to own design for scanning large-size objects,</li> <li>• APLAC software,</li> <li>• NI AWR Design Environment software,</li> <li>• GPU Tesla K20 adapter from NVIDIA,</li> <li>• GPU Tesla C2070 adapter from NVIDIA,</li> <li>• GPU GeForce GTX480s adapter from NVIDIA,</li> <li>• GPU JETSON TX1 development boards from NVIDIA.</li> </ul>

# Department of Databases and Computational Intelligence Systems

## Scientific and research issues:

The Department of Databases and Computational Intelligence Systems conducts research in the field of:

- digital signal processing,
- database (modelling and implementation),
- programming,
- artificial intelligence – automatic classification of objects,
- applications of artificial intelligence databases and methods in the fields of medicine, industry, etc.
- designing multi-criteria evaluation algorithms based on fuzzy logic for a wide range of unusual issues, based on linguistic description (especially attractive in areas where there are no formal evaluation patterns).

## SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	<p>SERVICES RELATING TO RECOGNITION OF DATA AND THEIR SOURCES:</p> <ul style="list-style-type: none"> <li>• preparation of expert systems and decision-making rules,</li> <li>• modelling and implementation of databases supported by the relational model;</li> </ul> <p>EXTRACTION OF AUDIO FEATURES FOR THE PURPOSE OF SOUND SOURCE RECOGNITION, E.G:</p> <ul style="list-style-type: none"> <li>• recognition of symptoms of speech diseases (stuttering, Parkinson's disease, Huntington's disease),</li> <li>• evaluation of the state of fatigue of speech apparatus and support for the process of rehabilitation of persons after laryngectomy (laryngectomised persons);</li> </ul> <p>THE USE OF ARTIFICIAL INTELLIGENCE METHODS FOR THE DESIGN OF TECHNOLOGICAL PROCESSES AND THE MONITORING OF MACHINING PROCESSES. SOLVING ATYPICAL PROBLEMS OF MULTI-CRITERIA EVALUATION ON THE BASIS OF LINGUISTIC DESCRIPTION – ESPECIALLY ATTRACTIVE IN AREAS WHERE THERE ARE NO FORMAL EVALUATION MODELS BUT THERE ARE PEOPLE WITH PRACTICAL EXPERIENCE.</p>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• creation of expert system supporting design of technological process or expert system supporting supervision of machining process,</li> <li>• analysis and design of an algorithm based on fuzzy logic that performs multi-criteria evaluation of problems described linguistically.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• programming instruction,</li> <li>• database and SQL modelling,</li> <li>• modelling of knowledge bases and expert support systems,</li> <li>• audio signal analysis,</li> <li>• consultancy on the selection and application of methods of computational intelligence.</li> </ul>

# Department of Information and Communication Technology

## Scientific and research issues:

The Department of Information and Communication Technology conducts research in the field of computer networks, in particular on:

- effectiveness of transmission in ICT networks (routing algorithms, network modelling),
- data protection in ICT networks (transmission security, cryptographic protocols and algorithms),
- the use of ICT networks and systems in health care, by efficient human-computer interfaces, including brain-computer ones.

## SCIENTIFIC RESEARCH PROSPECTS

SCIENTIFIC RESEARCH PROSPECTS	
<b>Business cooperation offer</b>	<p>ANALYTICAL SERVICES, EXPERTISE AND TECHNOLOGICAL CONSULTING FOR THE INDUSTRY IN THE FIELD OF:</p> <ul style="list-style-type: none"> <li>• effectiveness of transmission in computer networks, including wireless networks,</li> <li>• security of computer networks, including wireless networks,</li> <li>• medical computing,</li> <li>• medical robotics,</li> <li>• bio-cybernetic and neuro-cybernetic modelling of biological processes.</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• evaluation of the effectiveness of transmission in computer networks, including wireless networks,</li> <li>• services relating to the security of computer networks, including wireless networks,</li> <li>• medical information technology services (telemedicine and telerehabilitation) and medical robotics,</li> <li>• bio-cybernetic and neuro-cybernetic modelling of biological processes.</li> </ul>
<b>Training and consulting services</b>	<p>COURSES AND TRAINING IN THE FIELD:</p> <ul style="list-style-type: none"> <li>• computer networks at the level of Cisco CCNA, CCNA Security and CCNP,</li> <li>• web applications design: front-end developer (HTML5, CSS3, Bootstrap, JS, JQuery, XML) and back-end developer (PHP5/7, MySQL, web applications design in MVC model, frameworks, REST API),</li> <li>• programming (C#, Java, Python),</li> <li>• medical informatics and robotics.</li> </ul>
<b>Apparatus, testing equipment</b>	<ul style="list-style-type: none"> <li>• MATLAB, NEURON, GENESIS, Emergent software.</li> <li>• Computer Network Studio,</li> <li>• laboratories for learning programming.</li> </ul>





# INSTITUTE OF TECHNICAL SCIENCE

[www.technika.ukw.edu.pl](http://www.technika.ukw.edu.pl)



## The Authorities

Krzysztof Moraczewski, Ph. D., Eng., Associate Professor

## Contact Information



ul. Chodkiewicza 30,  
85-064 Bydgoszcz



52 34 19 331



insttech@ukw.edu.pl



www.technika.ukw.edu.pl

## Structure

- Department of Polyurethane Chemistry and Technology
- Department of Materials Engineering
- Department of Computer Science
- Department of Wood Structures
- Department of Fundamental Medical Bioengineering and Electrical Engineering
- Department of Fundamentals of Machine Design and Operation
- Department of Occupational Safety and Health Issues

**Scientific and research issues:**

Research works at the Institute are conducted in the area of technical sciences, including material engineering, as well as issues related to security and crisis management. Individual research undertaken by staff members focus on the following topics:



- testing of properties of the surface layer of polymeric materials,
- testing of various polymer composites,
- engineering materials testing: fatigue testing of reinforced polymer composites manufactured with the RTM method,
- bioelectromechanics and bioelectroacoustics of bones and bone substitutes (bone substituting biomaterials and endocrine implants),
- research on control systems for autonomous mobile robots,
- Internet educational communities – perspectives and conditions for their development in Poland,
- the use of acoustic emissions in the design of heat treatment processes for bearing steels,
- research on the synthesis of new polyols from 2-hydroxy-1,2,3-propane-tricarboxylic acid for the production of rigid PUR-PIR foams,
- testing of wood-polymer composites,
- testing of wood-based panels as structural materials,
- conservation of movable wooden monuments.

## Department of Polyurethane Chemistry and Technology

**Scientific and research issues:**

The Department of Polyurethane Chemistry and Technology conducts research in the field of organic chemical technology (synthesis) and polymer technology, in particular on:

- synthesis of new multi-hydroxyl compounds (polyols) for polyurethanes,
- synthesis of new halogen-free flame retardants in the form of flame retardant polyol,
- synthesis of polyols based on raw materials of plant origin,
- formulation of polyurethane foam materials,
- synthesis of polyurethane foam materials,
- chemical and physical modification of polyurethane foam materials,
- chemical and material recycling of selected polymeric materials,
- biodegradation of polyurethanes,
- analysis of raw materials and products (synthesis) for polyurethane materials,
- testing of physicochemical and functional properties of polyurethane foam materials.

### SCIENTIFIC RESEARCH PROSPECTS

#### Business cooperation offer

##### RESEARCH SERVICES FOR INDUSTRIES:

- construction,
- textile and footwear industry,
- furniture making,
- automotive industry,
- recycling and waste management;

##### POTENTIAL APPLICATION OF THE RESEARCH:

- development of technologies for obtaining multi-hydroxy new compounds (polyols), flame retardant compounds, taking into account economic aspects and market demand,
- development of ecological technology for production of new multi-hydroxyl compounds (bio-polyols), based on renewable raw materials, also bio-based materials with flame retardant properties of PUR plastics,
- obtaining new polyurethane foams with the use of various post-production and post-consumer polymeric materials,

<b>Business cooperation offer</b>	<ul style="list-style-type: none"> <li>obtaining new polyurethane foams using recycled raw materials from post-production and post-consumer plastics,</li> <li>chemical and material recycling of post-production waste and post-consumer polyurethane foams,</li> <li>testing of the physical and chemical properties of the raw materials needed to obtain polyurethane foams,</li> <li>testing of the physical and chemical properties of rigid polyurethane-polyisocyanurate foams.</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>selected analytical determinations of raw materials for PUR foams,</li> <li>determination of viscosity of various liquids,</li> <li>consultations on the formulation of polyurethanes,</li> <li>a consultation on the production of new polyols and biopolies for the production of rigid polyurethane foams,</li> <li>research on the properties of rigid polyurethane foams,</li> <li>consultations on the use of rigid polyurethane foams,</li> <li>raw material recycling of rigid polyurethane foams,</li> <li>analysis of selected gas products by gas chromatography,</li> <li>analysis of the biodegradability of polymeric materials,</li> <li>consultation on patenting.</li> </ul>
<b>Apparatus, testing equipment</b>	<ul style="list-style-type: none"> <li>station for obtaining rigid polyurethane foams,</li> <li>polyol raw materials production facility – a multifunctional laboratory reactor adapted to the synthesis of polyols and biopolies,</li> <li>polyol vacuum distillation station,</li> <li>azeotropic distillation station using the Dean-Stark method,</li> <li>station for the glycolysis process,</li> <li>Vicata test rig for the thermal resistance of plastics,</li> <li>stand for testing the brittleness of foams,</li> <li>foam flammability test rig – horizontal and vertical Bütler tests,</li> <li>viscosity tester – Hoeppler's viscometer and Fungilab's reoviscometer,</li> <li>polymer structure test rig – optical microscope,</li> <li>bench for simulating the ageing of rigid polyurethane foams,</li> <li>test rig for determining gaseous combustion products – TRACE 200 gas chromatograph,</li> <li>polyurethane biodegradation facility – OxiTop Control S6 apparatus,</li> <li>stand for testing microbiological biodegradation of polymeric materials,</li> <li>stand for testing the moisture content of plastics,</li> <li>stand for testing the pH and conductivity of polyols and biopolysols.</li> </ul>

## Manufacturing of rigid polyurethane polypolyisocyanurate foams: sale or licensing of patented inventions

### Description of the offer: Patents:

1. J. Paciorek-Sadowska, B. Czupryński, M. Borowicz, J. Liszkowska, Method of manufacturing rigid polyurethane-polyisocyanurate foams, date of granting of the patent: 5/16/2017, Pat. PL-227036. The subject of the invention is the method of production of polyurethane polyisocyanurate foams consisting in the reaction of polyisocyanate and polyol with the use of 33 % potassium acetate solution in diethylene glycol, 33 % solution of triethylenediamine in dipropylene glycol, polysiloxane-toxyethylene/propylene copolymer, tri(2-chloro-1-methyl ethyl) phosphate, distilled water and a natural filler in the form of ground soya, palm, sunflower, linseed, rice, coconut, safflower, hemp, pumpkin, mustard, evening primrose, milk thistle, nigella), and in particular rape cake. The method is characterized by the fact that it is carried out by adding to the recipe ground oilcake in the amount from 5% by weight (15.9 g) up to 60% by weight (190.5 g) most preferably from 5% by weight (15.9 g) up to 30% by weight (95.2 g) relative to the sum of the polyol and polyisocyanate weights.

2. J. Paciorek-Sadowska, M. Borowicz, B. Czupryński, J. Liszkowska, The method of producing polyurethane-polyisocyanurate foams, P. 412192, PAT. – pending. The subject of the invention is the method of production of polyurethane-polyisocyanurate foams, consisting in a polymeric reaction of 4,4'-diphenylmethane diisocyanate with polyol with a solution of 33 % potassium acetate in diethylene glycol, 33 % solution of triethylenediamine in dipropylene glycol, copolymer of polysiloxane-polyoxyethylene propylene, tri(2-chloro-1-methyl ethylene) phosphate, a mixture of 1,1,1,3,3-pentafluorobutane and 1,1,1,2,3,3,3-heptafluoropropane and a natural filler in the form of ground oak, pine, larch, beech, apple, pear or poplar bark, in particular oak. The reaction is characterized by the addition of ground bark in the amount of 5% by weight to the recipe. (15.9 g) up to 25% by weight (79.3 g) most preferably from 5% by weight (15.9 g) up to 20% by weight (63,4 g) relative to the sum of the polyol and polyisocyanate weights.

**Patent applications:**

1. J. Paciorek-Sadowska, M. Borowicz, B. Czupryński, J. Liszkowska, Method of obtaining polyol raw material for synthesis of rigid polyurethane-polyisocyanurate foams Patent application P.422888 - 2017
2. J. Paciorek-Sadowska, M. Borowicz, B. Czupryński, J. Liszkowska, Method of manufacturing of polyurethane-polyisocyanurate foams. Patent application P.421508 -2017
3. J. Liszkowska, B. Czupryński, J. Paciorek-Sadowska, M. Borowicz, Method of manufacturing of polyurethane-polyisocyanurate foams. Patent application P.422947 -2017.

**Keywords:**

- technology
- polyols
- biopolyols
- combustibility
- fillers
- biofillers
- modification of characteristics

**Action:**

- ☒ other

**Potential uses:** The solutions offered can be used in the chemical industry (organic synthesis). Products of these technologies, polyols, are used as raw materials in:

- construction – for the production of thermal insulation materials,
- furniture making – for the production of flexible foams (upholstered furniture, mattresses, seats),
- automotive industry – for the production of bumpers, shock absorbers, stoppers and seats,
- clothing industry – for the production of footwear and leather-like products,
- mining industry – for the production of sealing materials and coatings of moving parts.

## Department of Materials Engineering

**Scientific and research issues:**

The Department of Materials Engineering conducts research in the field of:

- developing the composition of new polymeric composites,
- properties of mechanical, structural, surface, optical and dielectric engineering materials,
- processing of thermoplastics,
- modification of surface properties of materials by plasma, corona discharge and laser techniques,
- studies of metallization processes of polymeric materials,
- degradation and biodegradation of polymeric materials,
- recycling of polymeric thermoplastics.

### SCIENTIFIC RESEARCH PROSPECTS

**Business  
cooperation  
offer**

ANALYTICAL SERVICES, EXPERT OPINIONS AND TECHNOLOGICAL CONSULTING FOR THE FOLLOWING SECTORS:

- processing of polymeric materials,
- production engineering and processing of engineering materials.

<b>Research services</b>	<p>MATERIAL RESEARCH WITH THE USE OF MODERN RESEARCH EQUIPMENT, E.G. IN THE FIELD OF:</p> <ul style="list-style-type: none"> <li>• Dynamic Mechanical Analysis (DMA),</li> <li>• Differential Scanning Calorimetry (DSC),</li> <li>• thermogravimetry and studies on oxidation of plastics,</li> <li>• surface and cross resistivity,</li> <li>• wettability and surface energy,</li> <li>• mechanical strength,</li> <li>• adhesive strength,</li> <li>• development of new polymeric compounds and composites,</li> <li>• ageing processes and their influence on changes in optical, mechanical and structural properties of polymeric materials,</li> <li>• biodegradation of polymeric materials,</li> <li>• identification of plastics and their chemical structure (mainly by FTIR and UV-Vis spectroscopic methods),</li> <li>• extrusion and injection moulding of plastics,</li> <li>• plasma, laser and crown discharge modification of polymeric materials.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• training services in the field of research and polymer material processing techniques.</li> </ul>
<b>Apparatus, testing equipment</b>	<ul style="list-style-type: none"> <li>• differential scanning calorimeter (DSC), type Q200 (TA Instruments, USA),</li> <li>• dynamic thermomechanical analyser (DMA), type Q800 (TA Instruments, USA),</li> <li>• thermogravimeter, type Q500 (TA Instruments, USA),</li> <li>• FTIR spectrophotometer, Nicolet iS10 type (Thermo Scientific, USA),</li> <li>• UV-VIS spectrophotometer, type Evolution 220 (Thermo Scientific, USA),</li> <li>• electrometer, type 6517A (Keithley Instruments, UK),</li> <li>• extruder, type W25-30D with systems for extrusion, granulation, extrusion and blow moulding (Metalchem, Poland),</li> <li>• injection moulding machine, type TRX 80 Eco (Tederic, Taiwan),</li> <li>• pastometer, type MP600 (Tinius Olsen, USA),</li> <li>• testing machine, type 3367 with video extensometer (Instron, USA),</li> <li>• corona discharge activator (Metalchem, Poland),</li> <li>• femto plasma generator (Diener Electronic, Germany)</li> <li>• Nd:YAG fibre laser (Techsol, Poland),</li> <li>• DSA 100 goniometer (Kruss, Germany),</li> <li>• slip tester, type 6196/000 (CEAST, Italy),</li> <li>• PosiTest adhesive strength tester (DeFelsko, USA),</li> <li>• aging chamber, type Suntest CPS+ (Atlas, Germany),</li> <li>• climatic chamber, type CCK-40/300 NG (Dycometal, Spain),</li> <li>• gas pycnometer, type MVP-D160E (Quantachrome Instruments, USA),</li> <li>• optical microscopes with digital imaging.</li> </ul>

## Department of Computer Science

### Scientific and research issues:

The Department of Computer Science conducts research in the field of artificial intelligence, in particular on:

- development methods for optimizing multiple extremes,
- developmental methods of multi-criteria optimisation,
- using fuzzy logic in the control system,
- construction and software of controllers with OFN arithmetic,
- data protection in ICT networks using artificial intelligence methods (transmission security, cryptographic protocols and algorithms).



SCIENTIFIC RESEARCH PROSPECTS	
<b>Business cooperation offer</b>	<p>ANALYTICAL SERVICES, EXPERTISE AND TECHNOLOGICAL CONSULTING FOR THE INDUSTRY IN THE FIELD OF:</p> <ul style="list-style-type: none"> <li>• expert opinions on innovativeness of IT systems,</li> <li>• expert opinions on innovativeness of mechatronic systems,</li> <li>• data mining methods,</li> <li>• artificial intelligence methods in industrial processes,</li> <li>• consultancy in the organisation of R&amp;D departments.</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• evaluation of the effectiveness of transmission in computer networks, including wireless networks,</li> <li>• services relating to the security of computer networks, including wireless networks,</li> <li>• data mining methods (industrial data – detection of rules and standards in processes),</li> <li>• artificial intelligence methods in industrial processes.</li> </ul>
<b>Training and consulting services</b>	<p>TRAINING COURSES:</p> <ul style="list-style-type: none"> <li>• programming (C/C++, C#, Java, Radio Studio),</li> <li>• CAx in Solid Works,</li> <li>• application of the R environment in the data analysis,</li> <li>• programming of mobile robots.</li> </ul>

## Department of Wood Structures

### Scientific and research issues:

The scientific activity of the Department covers two areas:

- structures of wood and wood-based materials and
- wood materials and wood-polymer composites.

Testing of structures made of wood and wood-based materials consists primarily of strength analyses performed using the finite element method and experimental studies on the influence of various factors on the load-bearing capacity and stiffness of these structures. In addition, roof trusses of buildings, in particular the analysis of their geometric characteristics, are the subject of research.

In the area of wood science (especially wood-based panels), research is carried out mainly on anisotropy of mechanical properties, taking into account the heterogeneity of wood material structure. It is accompanied by the search for solutions concerning the properties of wood-polymer composites as an alternative to classic wood materials. Great emphasis is placed on material recycling. New wood-polymer composites containing recyclable materials from used polymer products are being developed. Work is also underway on new wood-polymer composites using the post-consumer wood panel milling process and on alternative raw materials for the production of wood-based panels.

SCIENTIFIC RESEARCH PROSPECTS	
<b>Business cooperation offer</b>	<p>ANALYTICAL SERVICES AND TECHNOLOGICAL CONSULTANCY IN THE SELECTED SCOPE FOR:</p> <ul style="list-style-type: none"> <li>• the industry producing wood and wood-based materials,</li> <li>• furniture manufacturers.</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• testing of wood-based panels as construction materials, optimisation of their structure,</li> <li>• testing of wood-polymer composites,</li> <li>• research on structures made of wood and wood-based materials, in particular furniture,</li> </ul>



<b>Research services</b>	<ul style="list-style-type: none"> <li>stiffness and strength tests of structures and their elements, strength analyses using the finite element method,</li> <li>alternative raw materials for the manufacture of wood-based panels.</li> </ul>
<b>Apparatus, testing equipment</b>	<ul style="list-style-type: none"> <li>ZD10/90 testing machine – 2 pcs,</li> <li>OBR Czarna Woda testing machine,</li> <li>Messphysik ME-46 videoextensometer,</li> <li>a set of MT16 strain gauges,</li> <li>a set of mechanical extensometers with different bases,</li> <li>inductive sensor kit for measuring displacements,</li> <li>acoustic emission signal recorder,</li> <li>instrumentation enabling the wood-based panels to be sheared in different planes,</li> <li>test rig for testing the deformation of wood-based panels when they are subjected to torsion,</li> <li>test rig for testing creeping of wood materials,</li> <li>test rig for strength tests of joints used in wooden structures,</li> <li>test rig for durability testing of furniture frame structures (selected parameters),</li> <li>test rig for testing the deformations of furniture box constructions (selected parameters),</li> <li>Binder D 240 laboratory air dryers with forced air circulation,</li> <li>SUP-4 laboratory dryer with the possibility of humidification during the drying process,</li> <li>DS.-2/OBR shredder – chip cutter,</li> <li>LAB-11-200/UP laboratory sieve shaker with a set of sieves,</li> <li>WPS 1200C, PS 3500/C/1 electronic scales,</li> <li>moisture meter for wood,</li> <li>OPEK ADVANCED BINO microscopes with TV camera,</li> <li>ALGOR computer program for numerical analysis using the finite element method.</li> </ul>

## Department of Fundamental Medical Bioengineering and Electrical Engineering

### Scientific and research issues:

The scientific and research activities of the Medical Bioengineering Team at DFMBaEE cover two main research topics:

- prototype surface endoprostheses of joints with a biometric multi-pin bonding scaffold (MSC\_Scaffold) – fixing completely cement-free the joint surfaces of endoprosthesis in the periarticular bone,
- porous intraosseous implants – design and manufacture in laser technology.

<b>SCIENTIFIC RESEARCH PROSPECTS</b>	
<b>Business cooperation offer</b>	RESEARCH AND IMPLEMENTATION SERVICES, TECHNOLOGICAL CONSULTANCY FOR: <ul style="list-style-type: none"> <li>representatives of medical circles.</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>design and manufacture of prototype intraosseous implants from biometal powders in the incremental technology of selective laser melting (SLM).</li> </ul>

# Department of Fundamentals of Machine Design and Operation

## Scientific and research issues:

The company conducts research in the field of:

- metallurgy, heat treatment, cracking mechanics,
- selection and evaluation of construction and tool materials,
- modelling and computer simulation of the microstructure of materials,
- phenomena of acoustic emission and signal analysis,
- contact phenomena and the development of damage under long-term and fatigue loads,
- prevention of the risk of damage to the pressure equipment of fuel and energy installations by means of the, 'leak before burst' concept,
- design of specialised tanks for the storage of high-pressure gases, with particular regard to safety requirements,
- toothed belt gears,
- computer optimisation and improvement of automatic control systems,
- automated fault detection for wind power systems using mathematical process and signal models,
- modelling and computer simulation in biomedical engineering.

## SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	<p>ANALYTICAL SERVICES, EXPERT OPINIONS AND TECHNOLOGICAL CONSULTING FOR THE FOLLOWING SECTORS:</p> <ul style="list-style-type: none"> <li>• automotive industry,</li> <li>• aerospace industry,</li> <li>• industry of transport equipment and industrial automation, the so-called bio-intelligent specialisation (natural potential, environment, energy) and bioengineering.</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• metallographic research, structural research in scanning microscopy, analysis of the use of structural and tool steels and other metallic materials,</li> <li>• material expertise on the causes of wear and tear or damage to structures and machine parts, crack testing of automotive and aerospace products,</li> <li>• analysis using a dilatometer to determine the phase transition temperature and to forecast the hardenability of the steel,</li> <li>• application of acoustic emission in diagnostics of pressure vessels, operation of machines, heat treatment,</li> <li>• technical expertise and simulation tests of mechanical and mechatronic systems, designs of technical solutions, tests of functionality of technical systems,</li> <li>• evaluation of innovativeness of production and technical systems solutions, evaluation of innovativeness of construction materials.</li> </ul>
<b>Training and consulting services</b>	<p>TRAINING AND COUNSELLING IN THE FIELD OF:</p> <ul style="list-style-type: none"> <li>• material issues, metallurgy, metalworking,</li> <li>• mechanics, machine building and operation, technical diagnostics, SolidWorks software,</li> <li>• vocational training for health and safety at work.</li> </ul>

<b>Apparatus, testing equipment</b>	<ul style="list-style-type: none"> <li>• equipped metal workshop: light microscopes, image camera, grinders, polishers, fume hood,</li> <li>• laboratory hardening furnaces, one without protective atmosphere, the other with a technology that ensures semi-gas tightness in the atmosphere of nitrogen or argon,</li> <li>• acoustic emission measuring apparatus with amplifier, filtering, digital recording, signal analysis software using spectrograms and neural networks,</li> <li>• test benches for belt drive gears,</li> <li>• SolidWorks software for part modelling and visualisation.</li> </ul> <p>The laboratory is to be expanded under the project „Laboratories of technical sciences and sciences dedicated to the development of research potential in the field of innovative solutions and technologies of key importance for the economy of the Kujawsko-Pomorskie Voivodeship”:</p> <ul style="list-style-type: none"> <li>• Scanning microscope with EDS module (for chemical composition analysis), NIKON MA200 reverse metallographic microscope with 5Mpix camera,</li> <li>• gas-tight furnace with equipment,</li> <li>• DA-3 automatic dilatometer.</li> </ul>
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## Department of Occupational Safety and Health Issues

### Scientific and research issues:

The research work of the Department of Occupational Safety and Health Issues covers the following topics:

- studies of the organisational, social and technical aspects of civil, public and technical safety,
- studies of selected aspects of civil and public safety management,
- studies of selected aspects of occupational safety and health management,
- occupational risk and hazard studies in the working environment,
- studies of selected problems related to the protection of cultural heritage.

SCIENTIFIC RESEARCH PROSPECTS	
<b>Business cooperation offer</b>	ANALYSIS, EVALUATION AND TRAINING FOR: <ul style="list-style-type: none"> <li>• offices and public administration,</li> <li>• private entities from various sectors.</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• analysis of the safety status of selected objects / areas / institutions,</li> <li>• analyses and optimisation of technical measures applied for the safety of objects / areas,</li> <li>• occupational risk and hazard analyses in the working environment,</li> <li>• evaluation of the condition of historic buildings made of wood (construction structures and movable monuments) and substantive consultations for the contractors of conservation works.</li> </ul>
<b>Training and consulting services</b>	TRAINING IN THE FIELD OF: <ul style="list-style-type: none"> <li>• management of civil and technical safety,</li> <li>• methodology of safety analyses,</li> <li>• health and safety at work,</li> <li>• occupational risk assessment.</li> </ul>



# **FACULTY OF NATURAL SCIENCES**

[www.naukiprzyrodnicze.ukw.edu.pl](http://www.naukiprzyrodnicze.ukw.edu.pl)



## The Authorities

### Dean

Grzegorz Kołosowski, Ph. D., D. Sc., Eng.,  
Associate Professor

### Associate Dean for Science Affairs

Krystian Obolewski, Ph. D., D. Sc., Eng.,  
Associate Professor

### Associate Dean for Teaching Affairs

Magdalena Trojankiewicz, Ph. D.

## Contact Information



ul. Ogińskiego 16,  
85-092 Bydgoszcz



52 32 36 728



sekretariat.wnp@ukw.edu.pl



[www.naukiprzyrodnicze.ukw.edu.pl](http://www.naukiprzyrodnicze.ukw.edu.pl)

## Faculty Structure

- Institute of Experimental Biology
- Institute of Environmental Biology
- Chair of Evolutionary Biology



## Short Description of the Faculty

**The Faculty of Natural Sciences is the basic organisational unit of UKW (functioning in its current form since 2012) employing research staff that forms a coherent (as regards scientific disciplines) and dynamically developing centre of biological sciences in Poland.**

The Faculty offers degree courses in four majors: biology, biotechnology, environment protection and management of natural resources.

The topics of studies conducted at the Faculty are omni-directional and include natural, biological and environmental sciences, as well as biotechnology. The subjects of research include various organisms and cover the organisation of life at the molecular (biology and molecular genetics, biochemistry) and cellular (microbiology, cell biology) levels, as well as plants and animals.

Detailed research areas include: population genetics of trees, microbiological analysis of natural waterbodies, impact of environmental conditions on mycorrhizal relationships, natural resources of animals, plants and fungi, and their biodiversity. Moreover, analyses of the levels of mycotoxins in food, feed and tissues of living organisms, as well as fermentation processes are performed.

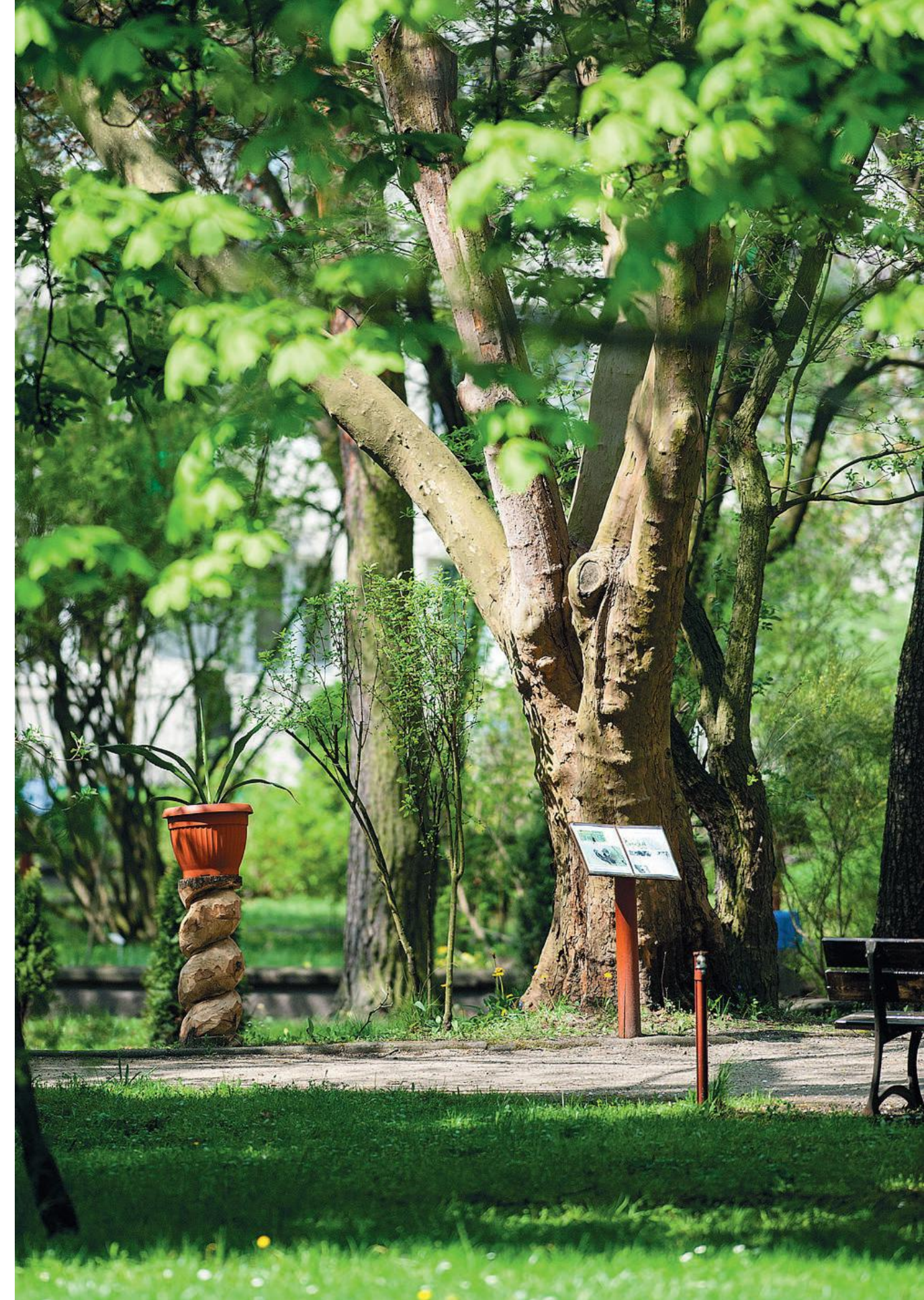
The Faculty staff consists of over 50 scientific employees, including 7 with a title of professor, 14 with a degree of habilitated doctor and 21 with a degree of PhD.

The functioning and strategy of the Faculty are based on the existing achievements of the scientific staff and cooperation with research centres in Poland and abroad, which serves the Faculty's dynamic development manifested as continuous broadening of the scope of scientific research, development and commercial consultancy services for the business.

Since 2008, the Faculty has been entitled to grant the degree of doctor of biological sciences in the discipline of biology. The ultimate achievement in the scientific and personnel-related development of the unit in recent years was receiving on 30 May 2016 the entitlement to grant the degree of doctor of biological sciences in the discipline of ecology from the Central Commission for Degrees and Titles.











# **INSTITUTE OF EXPERIMENTAL BIOLOGY**

[www.ibe.ukw.edu.pl](http://www.ibe.ukw.edu.pl)



## The Authorities

Joanna Moraczewska, Ph. D., D. Sc.,  
Associate Professor

## Contact Information



Al. Powstańców Wielkopolskich 10,  
85-090 Bydgoszcz



52 37 67 912



ibe@ukw.edu.pl



[www.ibe.ukw.edu.pl](http://www.ibe.ukw.edu.pl)

## Structure

- Chair of Physiology and Toxicology
- Chair of Genetics
- Laboratory for Milk Testing
- Department of Biochemistry and Cell Biology
- Department of Biotechnology
- Department of Immunobiology
- Department of Microbiology

**Scientific and research issues:**

The research topics at the Institute of Experimental Biology cover subjects in the following areas: genetics, biochemistry and cell biology, industrial biotechnology, and microbiology and toxicology. Conducted are studies related to the genetic variability of populations of forest trees and insects in the context of conservation of genetic resources, genomics of adaptation of forest trees and genetic markers in the identification of forest reproduction material, as well as individual identification of trees (wood) in forensic proceedings. Studies in the field of cell biology focus, e.g., on issues related to the molecular mechanisms of actin filament regulation in muscle and non-muscle cells. In the area of biotechnology, the main research topics are associated with optimisation of fermentation processes and characterisation of micro-organisms used in biotechnology processes. Another vibrant research area is contamination of feedstuffs, food and body organs with mycotoxins, as well as food safety.

## Chair of Physiology and Toxicology

**Scientific and research issues:**

Studies involving mycological and mycotoxicological analyses, in particular:

- contamination of feedstuffs, food and body organs with mycotoxins,
- determination of the impact of contamination of agricultural food products with mycotoxins on the development of prostate cancer in men,
- influence of environmental contamination with moulds on allergic fungal rhinosinusitis,
- use of the MTT assay in the determination of mycotoxin contamination in the food chain,
- contamination of corncobs in large-scale crops by moulds and mycotoxins, and their impact on zearale-none mycotoxicosis in the wild boar population,
- contamination of confined spaces with pathogenic moulds and mycotoxins,
- contamination of food and feedstuffs by pathogenic moulds,
- identification using molecular biology techniques (PCR, DNA sequencing) of micro-organisms (bacteria, yeasts, moulds) occurring in food, feedstuffs, dietary supplements, clinical material, mould-contaminated confined spaces,
- identification of hybrids of domestic swine and European wild boar (Iron Age pigs) originating from illegal farms using molecular biology techniques.

### SCIENTIFIC RESEARCH PROSPECTS

#### Business cooperation offer

ANALYSIS AND EXPERTISE SERVICES, AS WELL AS TECHNOLOGY COUNSELLING FOR:

- healthcare services,
- veterinary services,
- quality inspection of Commercial Food Articles,
- sanitary epidemiology stations,
- food industry,
- feedstuff industry,
- livestock farmers,
- construction industry,
- users of mould-infested houses,
- forensic experts.

<b>Research services</b>	<p><b>LABORATORY ANALYSES:</b></p> <ul style="list-style-type: none"> <li>• assessment of contamination of food, feedstuffs and body organs with pathogenic fungi and mycotoxins,</li> <li>• analysis of mycotoxins using chromatography methods (HPLC, GC, HPLC-MS/MS),</li> <li>• methods to detoxify mycotoxins in vivo and in vitro,</li> <li>• risk of mould infestation of walls and microclimate of confined spaces,</li> <li>• evaluation of the toxicity of contamination using the MTT cytotoxicity test,</li> <li>• analysis of volatile fatty acids,</li> <li>• determination of the total quantity of yeasts and moulds in food and feedstuffs (PN-ISO 7954:1999; PN-ISO 21527-1:2009),</li> <li>• genus and species identification of moulds and bacteria using traditional culture methods and molecular biology techniques (PCR, DNA sequencing),</li> <li>• identification of hybrids of domestic swine and European wild boar (Iron Age pigs) originating from illegal farms using molecular biology techniques.</li> </ul>
<b>Training and consulting services</b>	<p><b>COLLECTIVE AND INDIVIDUAL TRAINING SESSIONS AND SCIENTIFIC-TECHNICAL CONFERENCES COVERING</b></p> <ul style="list-style-type: none"> <li>• the presence of contaminants in food, feedstuffs and the environment,</li> <li>• legislation and strategies for prevention of food and feedstuff contamination,</li> <li>• toxicological aspects of contamination,</li> <li>• food, feedstuff and nutritional safety.</li> </ul>

## Determination of mycotoxins in food and feedstuffs

**Description of offer:** Determination of mycotoxins in samples of food and feedstuffs using the latest analytical equipment (liquid chromatography coupled with mass spectrometry (HPLC-MS/MS) using equipment from Sciex (API 4000, QTRAP5500) and Merck-Hitachi chromatography equipment with UV/FL and refractometric detectors). The methods used are the most reliable identification techniques. Samples are purified using immunoaffinity columns (AflaTest-Vi-cam, Ochraprep-R-BiopharmRhôneLtd) and SPE Bond Elut® Mycotoxin.

**Potential uses:** The possibility of continuous monitoring of the level of mycological contamination in food and feedstuffs at different stages of production (raw material, each production stage and the final product).

**Keywords:**

- mycotoxins
- LC-MS
- HPLC-FLD

**Action:**

- ☒ research service

## Determination of the quantity of yeasts and moulds in food, feedstuffs and air inside buildings

**Description of offer:** Determination of the quantity of yeasts and moulds in food and feedstuff samples using microbiological methods (PN-ISO 7954:1999; PN-ISO 21527-1:2009). Tests for the microbiological purity of air using the impact method and MAS-100 equipment. Tests for the microbiological purity of surfaces using contact plates (walls, floors, machines) or swabs.

**Potential uses:** The possibility of monitoring of the level of mycological contamination in food and feedstuffs at different stages of production (raw material, each production stage and the final product). The ability to assess the degree of mycologic contamination of the atmospheric air in production and residential buildings, repositories, etc.

**Keywords:**

- moulds
- identification

**Action:**

- ☒ research service

## Identification of micro-organisms – bacteria, moulds and yeast-like fungi

**Description of offer:** Genes and species identification of micro-organisms (bacteria, moulds and yeast-like fungi) in samples of food and feedstuffs, and samples from houses contaminated with moulds, conducted using standard microbiological methods and modern molecular biology techniques including PCR.

**Potential uses:** Tests for the presence of pathogenic micro-organisms (bacteria, toxin-producing moulds) in food and feedstuffs at various stages of production (raw material, each production stage and the final product).

### Keywords:

- identification of micro-organisms
- moulds
- bacteria
- PCR

### Action:

- ☒ research service

## Chair of Genetics

### Scientific and research issues:

Research areas related to the genetics of forest trees:

- genetic variability of the population of forest trees in the context of conservation of genetic resources (genetic variability within population, genetic variability between populations, phylogeography of species and evaluation of their adaptive potential),
- mating systems and gene transfer in populations of forest trees (establishing mechanisms which determine the level of genetic variability of a population, with special emphasis on the course of reproduction processes, including the level of self-fertilisation, gene transfer within and between populations, and correlations of the male and female reproductive success),
- development of new methods of assessment of genetic processes in populations (new statistical methods and evaluation and modernisation of existing methods in order to adapt the statistical methods to the specificity of genetic markers),
- use of genetic markers to identify forest reproductive material and individually identify trees (wood) in forensic proceedings,
- use of the knowledge of forest tree genetics in the selection farming and management of gene resources,
- ecology and population genetics of selected groups of insects inhabiting hollows in trees growing in roadside alleys,
- genomics of forest trees—studies concern the identification of candidate genes associated with phenological development, their resequencing and analysis of polymorphisms, as well as their regulatory elements in a large geographical scale.

### SCIENTIFIC RESEARCH PROSPECTS

#### Business cooperation offer

ANALYSIS AND EXPERTISE SERVICES, AS WELL AS COUNSELLING AND TRAINING FOR:

- forestry,
- horticulture,
- veterinary services,
- livestock farmers,
- bee-keeping industry,
- forensics,
- police,
- forest Guard;



	<p>POTENTIAL USES OF THE CONDUCTED RESEARCH:</p> <ul style="list-style-type: none"> <li>• DNA-barcoding of plants and animals,</li> <li>• developing methods to reduce losses in the forest and wood bioeconomy, construction losses caused by trees and losses of producers of ornamental trees, Christmas trees and varieties of trees that should be protected by patents (gardening businesses), using tree DNA analysis (identification of species and individual) to prove theft of wood from the stem and stacks, illegal cutting and damaging trees, damage to walls, tombs and sewer installations caused by trees,</li> <li>• developing technologies of tracking wood using DNA analysis from the forest, through transport and the final product (DNA traceability), and developing technologies of genetic certification of valuable wood (sold through auctions) to guarantee the origin of wood from a particular tree (species and individual).</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• determination of the subspecies (race) identity of bees using DNA markers,</li> <li>• determination of the genome of an organism without a reference sequence, including gene identification,</li> <li>• genotyping using microsatellite markers of groups/populations of organisms,</li> <li>• identification of SNPs and association of markers with environmental factors/phenotypes,</li> <li>• statistical analyses.</li> </ul>
<b>Training and consulting services</b>	<p>COLLECTIVE AND INDIVIDUAL TRAINING SESSIONS, COUNSELLING, SUBJECT MATTER CONSULTATIONS FOR FARMERS REGARDING:</p> <ul style="list-style-type: none"> <li>• genetic diseases of livestock, e.g., pigs, cattle, horses,</li> <li>• genetic diseases of domestic animals, e.g., dogs, cats;</li> </ul> <p>TRAINING SESSIONS FOR INSTITUTIONS INTERESTED IN USING DNA ANALYSIS OF TREES.</p>

The Chair of Genetics at UKW offers DNA analyses to identify individuals, as well as to determine the origin of material from forest trees. Performing the test is possible even with a small amount of plant tissue found with the suspect (e.g., one needle from a conifer, a match-sized piece of wood) or material from the alleged source of origin (e.g., stolen trunk, stack). Professional analyses are of key importance in cases involving stealing wood, damaging trees, and whenever plant material has been collected as evidence during investigation (e.g., wood, leaves, needles or their fragments) and there is a need to check whether it comes from the site of offence/crime.

More information can be found at [www.analizydnadrzew.ukw.edu.pl](http://www.analizydnadrzew.ukw.edu.pl)

## Forest tree DNA analyses of for law enforcement and judicial authorities

**Description of offer:** Expert analyses based on microsatellite DNA sequence This method is analogous to the technique used for determining paternity and identification of individuals in humans. The technique allows not only ascertaining the genetic identity of the supplied samples, but also proving their origin from a particular stolen trunk or stack. Forests that occupy nearly 30% of the surface area of Poland are not only objects, but sometimes also witnesses to offences and crimes (murders, batteries, rapes). In many cases, there is a substantial likelihood to find and secure traces of the delict (wood fragments, needles, leaves on the body or in the victim's/suspect's vehicle), which can be compared with the trees growing at the site. In this way, it is possible to link the victim/suspect with the site of events, which allows law enforcement authorities to quickly test investigation hypotheses. Precise analyses conducted at the Department of Genetics allow reanalysing cases that were transferred to the police archives due to unsuccessful identification of the perpetrator. If a proof such as a leaf or a splinter is found, it is possible to analyse its DNA even after many years. This means that forensic technician should also pay attention to trees any elements derived from them, as they can constitute excellent evidence.

**Potential uses:** Forest guard, police, prosecution, judges—allow proving guilt and conviction of perpetrators of illegal logging and damaging trees, as well as theft of wood (including stacks). Companies conducting restoration after construction damage caused by trees can prove that a wall, sewage pipes or tombstones at a cemetery are damaged by the roots of a specific tree. In such a situation, it is possible to precisely cut down the tree that causes damage and protect the neighbouring trees. Claim management companies dealing with transport damage can use DNA analysis to prove (or exclude) that damage resulted from collision with a particular tree. To this end, it is necessary to collect fragments of wood at the site of the incident (e.g., bumper) and sample wood from the tree that was hit by the vehicle.

**Keywords:**

- trees
- DNA
- identification

**Action:**

- ☒ research service

## Laboratory for Milk Testing

### Scientific and research issues:

Laboratory for Milk Testing is a service unit that offers microbiological testing of biological material, mainly raw cow milk and swabs from the reproductive tract of cows and mares. The Laboratory for Milk Testing is specialised in the monitoring of the aetiological factors of mastitis and their drug susceptibility.

### SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	ANALYSIS AND EXPERTISE SERVICES, AS WELL AS COUNSELLING FOR: <ul style="list-style-type: none"> <li>• dairy farmers and milk producers,</li> <li>• veterinary surgeons,</li> <li>• livestock farmers.</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• bacteriological and mycological tests of raw milk,</li> <li>• determination of bacterial drug susceptibility,</li> <li>• determination of antibiotic residues in milk using the Delvotest method,</li> <li>• bacteriological tests for Mycoplasma using the plate method,</li> <li>• bacteriological and cytological tests of uterine swabs from mares and cows,</li> <li>• microbiological tests of other biological material.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• counselling and subject matter consultations regarding test results.</li> </ul>

## Microbiological tests of milk

**Description of offer:** Bacteriological tests of milk with the determination of aetiological factors of mastitis and their drug susceptibility as an indispensable element of rational prevention and treatment of udder inflammation in cows.

**Potential uses:** Monitoring of the microbiological quality of raw milk in dairy farms.

**Keywords:**

- milk
- mastitis
- antibiogram

**Action:**

- ☒ research service

## Department of Biochemistry and Cell Biology

### Scientific and research issues:

Protein biochemistry tests, in particular:

- isolation and purification of muscle proteins from animal tissues,
- optimisation of the process of production and purification of recombinant proteins in prokaryotic systems,
- introduction of point mutations into cDNA coding for selected recombinant proteins,
- structural analysis of proteins: proteolytic (e.g., FASTpp), spectroscopic (turbidimetry) and fluorimetric (measurements of fluorescence spectra and FRET) methods,
- functional analysis of interactions between proteins: cosedimentation method, measurements of the enzymatic activity of actomyosin, Western blot, fluorescence microscopy.

The Department of Biochemistry and Cell Biology conducts studies under the research grant titled "Molecular mechanisms of regulation of thin filament by the muscle isoforms of tropomyosin. A biochemical and structural approach." Studies conducted under the project expand the knowledge about genetic mutations leading to myocardial and skeletal muscle pathologies. Better understanding of the molecular nature of congenital muscle disorders is important for the future search for appropriate forms of treatment.

### SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	ANALYSIS SERVICES, AS WELL AS TECHNOLOGY COUNSELLING FOR: <ul style="list-style-type: none"> <li>• chemical industry,</li> <li>• pharmaceutical industry.</li> </ul>
<b>Research services</b>	PRODUCTION AND LABORATORY ANALYSES CONCERNING: <ul style="list-style-type: none"> <li>• isolation of plasmid DNA,</li> <li>• targeted mutagenesis,</li> <li>• protein expression in bacterial cells,</li> <li>• disruption of tissues and disintegration of cells,</li> <li>• protein purification using chromatography techniques,</li> <li>• quantitative and qualitative protein analyses.</li> </ul>
<b>Training and consulting services</b>	TRAINING SERVICES IN: <ul style="list-style-type: none"> <li>• production and purification of proteins from animal tissues and recombinant proteins obtained in prokaryotic systems,</li> <li>• targeted mutagenesis,</li> <li>• structural and functional analyses of proteins.</li> </ul>

## Department of Biotechnology

### Scientific and research issues

Studies in industrial biotechnology:

- optimization of fermentation processes,
- characterisation of the micro-organisms used in biotechnology processes,
- effectiveness of the enzymatic degradation of polysaccharides of plant origin (starch, cellulose),
- production of surfactants using micro-organisms,
- prospects of using the biomass of microalgae in water bioremediation processes.

## SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	<p>ANALYSIS AND EXPERTISE SERVICES, AS WELL AS TECHNOLOGY COUNSELLING FOR:</p> <ul style="list-style-type: none"> <li>• distillery industry,</li> <li>• wine industry,</li> <li>• brewery industry,</li> <li>• chemical industry.</li> </ul> <p>The Department of Biotechnology includes the <b>Laboratory of Fermentation Technologies and Bioprocesses</b> whose commercial study offer provides comprehensive support for technological processes of brewery, wine and distillery products:</p> <ul style="list-style-type: none"> <li>• improving industrial strains and recipes,</li> <li>• expert analyses of fermentation technology,</li> <li>• chemical analysis of beer, wine, distillery raw materials.</li> </ul>
<b>Research services</b>	<p>ANALYTICAL SERVICES FOR THE DISTILLERY INDUSTRY:</p> <ul style="list-style-type: none"> <li>• general analysis of distilled alcohol using capillary gas chromatography (GC),</li> <li>• determination of alcohol content using the areometric and pycnometric methods (reserve method) in accordance with PN-A-79529-4:2005,</li> <li>• determination of the effectiveness of amylolytic enzymes used for starch hydrolysis during the process of mashing based on the concentration of selected carbohydrates established using high performance liquid chromatography (HPLC),</li> <li>• determination of efficiency of ethanol production from starch materials using fermentation,</li> <li>• determination of moisture content in raw material using the scale dryer method,</li> <li>• general characteristics of the course of the alcoholic fermentation process.</li> </ul> <p>LABORATORY ANALYSES FOR THE BREWERY INDUSTRY:</p> <ul style="list-style-type: none"> <li>• determination of the degree of malt saccharification during the process of brewing using high performance liquid chromatography (HPLC),</li> <li>• determination of the ethanol concentration in beer using high performance liquid chromatography (HPLC),</li> <li>• determination of the concentration of volatile by-products of fermentation using capillary gas chromatography (GC),</li> <li>• determination of the apparent and real extracts of beer using the areometric and refractometric methods,</li> <li>• conducting the forcing test of beer using the Hartong method,</li> <li>• determination of the total acidity of beer by visual or potentiometric titration (reserve method),</li> <li>• determination of the concentration of free amine nitrogen (FAN) and protein content in beer using the spectrophotometric method,</li> <li>• determination of the content of reductive substances in beer using the spectrophotometric method,</li> <li>• VDK (two ketones including diacetyl) determination in beer using the Carlsberg method,</li> <li>• determination of the basic quality parameters of the process water.</li> </ul> <p>LABORATORY ANALYSES FOR THE WINE INDUSTRY:</p> <ul style="list-style-type: none"> <li>• determination of the content of organic acids, i.e. acetic, lactic, malic, tartaric, succinic, citric and fumaric acids in musts and wine using high performance liquid chromatography (HPLC),</li> <li>• determination of the ethanol concentration in wine using high performance liquid chromatography (HPLC),</li> <li>• determination of the concentration of volatile by-products of alcoholic fermentation in wine using capillary gas chromatography (GC),</li> <li>• determination of the volatile acidity of wine in accordance with PN-A-79120-08:1990,</li> <li>• determination of the total acidity of wine in accordance with PN-A-79120-07:1990,</li> </ul>

<b>Research services</b>	<ul style="list-style-type: none"> <li>determination of the concentration of sulfuric dioxide in wine using a method according to PN-A-79120-10:1990,</li> <li>determination of the sugar concentration in musts and wine using high performance liquid chromatography (HPLC).</li> </ul> <p>Methods using gas chromatography allow quantitative and qualitative tests of the volatile ingredients responsible for the ageing of beer.</p>
<b>Training and consulting services</b>	<p>TRAINING SERVICES IN:</p> <ul style="list-style-type: none"> <li>the proper conduct of biotechnology processes using enzymatic (enzymatic hydrolysis of macromolecular compounds) and microbiological techniques (culturing microorganisms on model and industrial media, inoculation of media, isolation of cultures from the natural environment, sterilisation of the equipment used in the process).</li> </ul>

## Technology counselling for the distillery industry

### Description of offer:

- Optimisation of the technological process, taking into account saving energy, maximizing the use of raw materials and the productivity of fermentation vessels in distilleries.
- Eco-friendly use of distillery extract.
- Formation of technological recommendations for distilleries and implementation of novel enzyme preparations and their compositions, new strains of distillery yeasts.
- Technology of processing unusual distillery raw materials (assessment of the composition and suitability for processing, estimated profitability of processing).
- Transition from the energy-consuming classic technology to the method of non-pressurised starch release.

**Potential uses:** Reducing investment costs, simplification of technological operations, shortening the time of fermentation.

### Keywords:

- alcohol
- fermentation

### Action:

- ☒ training and consulting offer

## Determination of the content of organic acids in wine

**Description of offer:** Determination of the content of organic acids, i.e. acetic, lactic, malic, tartaric, succinic, citric and fumaric acids in musts and wine using high performance liquid chromatography (HPLC).

**Potential uses:** Precise determination of organic acids of critical importance in creating the flavours of wine.

### Keywords:

- chromatography
- wine

### Action:

- ☒ research service



# **INSTITUTE OF ENVIRONMENTAL BIOLOGY**

[www.srodowisko.ukw.edu.pl](http://www.srodowisko.ukw.edu.pl)





## The Authorities

Prof. Barbara Kieliszewska-Rokicka, Ph. D., D. Sc.

## Contact Information



Al. Ossolińskich 12,  
85-093 Bydgoszcz



52 36 08 391



a.lang@ukw.edu.pl



[www.srodowisko.ukw.edu.pl](http://www.srodowisko.ukw.edu.pl)

## Structure

- Chair of Ecology
- Chair of Mycology and Mycorrhiza
- Department of Botany
- Department of Hydrobiology
- Department of Carpology
- Botanical Garden

**Scientific and research issues:**

At the Institute of Environmental Biology, conducted are studies of plants, animals and fungi in natural and anthropogenically changed terrestrial and aquatic ecosystems. The subject of assessment is the wealth of plant, insect pollinator and fungal species in different regions of Poland and habitats, as well as changes in the flora, fauna and mycobiota occurring due to anthropopressure. Hydrobiological studies of selected reservoirs are also conducted. The results of research and field studies are used to assess the risks to various species and communities of plants, animals and fungi, and evaluation of natural habitats.



## Chair of Mycology and Mycorrhiza

**Scientific and research issues:**

The Chair conducts studies of the effect of environmental conditions on the functioning of plants, fungi and soil microorganisms in natural ecosystems and those changed by human activity, including urban ecosystems.

The key research topics include:

- mycorrhizal relationships of trees and herbaceous plants, and the physiological activity of soil microorganisms,
- macrofungi of urban habitats,
- effect of various mycorrhizal fungi on the tolerance of tree cuttings to stress conditions—studies conducted in controlled conditions.

### SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	ANALYTICAL AND TRAINING SERVICES FOR: <ul style="list-style-type: none"> <li>• forestry,</li> <li>• agriculture,</li> <li>• horticulture.</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• assessment of the status of mycorrhizal symbiosis of adult trees and cuttings (e.g., in nurseries),</li> <li>• analysis of the microbial activity of soil,</li> <li>• expert analyses in mycology.</li> </ul>
<b>Training and consulting services</b>	POPULARISATION AND EDUCATION ACTIVITIES AIMED AT DIFFERENT AGE GROUPS IN THE FORM OF FIELD WORKSHOPS, EXHIBITIONS AND LECTURES CONCERNING: <ul style="list-style-type: none"> <li>• knowledge of edible and poisonous mushrooms.</li> </ul>

## Analysis of the microbial activity of soil

**Description of offer:** Analysis of the activity of soil enzymes.

**Potential uses:** Assessment of the metabolic potential and fertility of soil in agricultural crops, forest tree nurseries, urban areas.

**Keywords:**

- soil
- soil enzymes
- soil fertility

**Action:**

- ☒ research service

## Assessment of the status of mycorrhizal symbiosis of adult trees and cuttings

**Description of offer:** Analysis of the degree of root colonisation by mycorrhizal fungi and the biodiversity of the community of mycorrhizal symbionts.

**Potential uses:** Assessment of the status of mycorrhiza of trees and cuttings in different habitats.

**Keywords:**

- ectomycorrhiza
- arbuscular mycorrhiza

**Action:**

- ☒ research service

## Expert analyses in mycology

**Description of offer:** Identification of the fungi inhabiting the trunks of trees.

**Potential uses:** Assessment of the health of trees, e.g., in urban environment.

**Keywords:**

- macrofungi
- pathogens
- saprotrophs

**Action:**

- ☒ research service

# Department of Botany

### Scientific and research issues:

Studies of flora and plant communities:

- recognition of the vegetation cover in the various regions of Poland, mainly in the Kujawy and South Pomerania regions, as well as in Wielkopolska, Lubusz Land,
- vegetation cover of areas with high natural value and those strongly transformed by human (river valleys and watercourses, xerothermal grasslands, forests, etc.),
- diversity and transformation of forest communities,
- dependence of vegetation cover of motorway roadsides on the economic use and geobotanic region, succession of halophytes in secondary habitats and documentation of sites of occurrence of rare and endangered plants in the Kujawy and Pomerania region.

### SCIENTIFIC RESEARCH PROSPECTS

**Business cooperation offer**

- expert analyses, opinions, wildlife inventories for business establishments and state institutions.

## Results of the inventory of natural habitats, and sites and habitats of plant species from Annex II of the Habitats Directive, together with determination of the status of protection (narrative and cartographic parts) - Gulf of Puck and Hel Peninsula (PLH 220032) - example of implementation

**Description of offer:** Performing an inventory along with the assessment of the conservation of plant species populations and natural habitats (including protected and endangered).

**Potential uses:** Protection Task Plans for Natura 2000 areas.

**Keywords:**

- wildlife inventory
- wildlife expert analysis

**Action:**

- ☒ research service

## Department of Hydrobiology

### Scientific and research issues:

The Department of Hydrobiology conducts studies of the hydrozoology of aquatic ecosystems and remediation of lakes. Studies in this field are associated with the effect of different levels of anthropopressure on aquatic ecosystems and are used to increase the current knowledge and the possibilities of its practical use. This applies to both lotic and lentic ecosystems in the context of their protection against degradation and methods of renaturation. At the same time, methods of implementation of the "ecosystem services" principles are analysed for proper protection and management of such natural systems.

Specific research areas include:

- studies of aquatic ecosystems,
- studies of bottom sediments of water reservoirs with particular regard to the quantity of phosphorus,
- hydrobiologic assessment of the ecological status of aquatic ecosystems,
- studies of the course of self-purification of surface waters,
- modelling and forecasting the ecological status of aquatic ecosystems,
- assessment of the impact of investment on the environment.

### SCIENTIFIC RESEARCH PROSPECTS

#### Business cooperation offer

- research services and subject matter counselling in the area of water quality analysis and environmental impact of investment on the aquatic environment,
- cooperation in the development of remediation concepts for degraded aquatic ecosystems,

<b>Research services</b>	<p>PRACTICAL APPLICATIONS OF THE STUDIES:</p> <ul style="list-style-type: none"> <li>comprehensive hydrochemical analysis of surface waters in terms of both in situ and ex situ, using cutting-edge field meters and a fully equipped laboratory,</li> <li>modelling and shaping ecosystems,</li> <li>conducting a systemic natural evaluation,</li> <li>hydrobiologic analyses of macrozoobenthos, phytoplankton and periphyton,</li> <li>comprehensive services of developing concepts of renaturation and remediation of aquatic ecosystems, along with the service of monitoring of occurring changes,</li> <li>reports from the assessment of environmental impact expert analyses of the impact of investment on the changes occurring in the aquatic environment,</li> <li>analyses of the size of groundwater fluctuations, along with an analysis of its chemical composition.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>training in the principles of biomonitoring of the aquatic environment, including the provisions of the Water Framework Directive.</li> </ul>

## Modelling and analysis of data - hydrological processes

**Description of offer:** Methods of data mining used to analyse environmental data: multiple regression, classification trees, the "random forest" algorithm, neural networks, numeric methods (CA, CCA, PCA, DCA, RDA). Modelling the hydrology, hydrodynamics and quality of water in rivers, reservoirs and estuaries Simulation of data in mathematical models. Calibration and validation of models Applications of mathematical models in predicting the hydrological processes and in the management of waters.

**Potential uses:** Forecasting changes resulting from human activity for public administration units or private investors. Developing pre-investment static and dynamic models for public administration units or private investors. Collective and individual training sessions, counselling, subject matter consultations for contractors.

### Keywords:

- forecasting
- planning
- management
- hydrology

### Action:

- ☒ research service
- ☒ training and consulting offer

## Department of Carpology

### Scientific and research issues:

The staff of the Department of Carpology conduct studies in plant developmental biology, ontogenesis, anatomy, morphology, histology, carpology and taxonomy.

### SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	<p>ANALYSIS AND EXPERTISE SERVICES, AS WELL AS TECHNOLOGY COUNSELLING FOR:</p> <ul style="list-style-type: none"> <li>• environment protection,</li> <li>• botanical gardens,</li> <li>• PAS institutes,</li> <li>• industrial design,</li> <li>• advertising and marketing.</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• preparation of microscopic specimens from plant material,</li> <li>• analysis of images of histological and macroscopic objects (length, width, thickness, circumference, surface area, form factor),</li> <li>• photographic documentation of microscopic specimens and the surface of objects in scanning electron microscopy,</li> <li>• designing ornamental patterns on different materials.</li> </ul>

## Botanical Garden

### Scientific and research issues:

Employees of the Botanical Garden mainly study the variability and diversity of plants. Specific research topics include:

- studies of the taxonomic diversity of plants,
- studies of the geographic variability and diversity of plants, particularly including tree species, using the plant material obtained in the field,
- biometric measurements of trees,
- analysis carried out on the basis of the biometric measurements of the characteristics of plant parts, particularly including the leaves, fruit and seeds, using a stereoscopic microscope, and analysis of images from light and scanning microscopes,
- comparative analyses, including statistical analyses,
- characterisation and analysis of flora and vegetation, particularly including forest areas,
- determination of the status and risks of flora and vegetation,
- phenological observations of tree species,
- observations and analyses of the activity of birds and bats, and inhabiting buildings and other sites by them.

Moreover, the Botanical Garden staff lead education classes for all ages in biodiversity and its protection.



## SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	<ul style="list-style-type: none"> <li>• services regarding environmental impact and possible natural compensation for various industries,</li> <li>• designing nature trails as compensation measures.</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• identification of plant species at different phases of development, also based on parts of plants,</li> <li>• assessment of the state of health of plants based on the analyses of microscopic images and biometric studies,</li> <li>• assessment of the environment condition based on the assessment of vegetation,</li> <li>• measurements and expert analyses in dendrology, including the in-depth visual analysis,</li> <li>• monitoring of buildings and other objects for the occurrence of birds and bats, data analysis.</li> </ul>
<b>Training and consulting services</b>	<p>TRAINING AND COUNSELLING REGARDING:</p> <ul style="list-style-type: none"> <li>• protection of trees during investment implementation,</li> <li>• protection of birds and bats during investment implementation,</li> <li>• selection of species for planting,</li> <li>• gardening activities,</li> <li>• designing nature trails, designing and drafting educational tables and guides about nature;</li> </ul> <p>CONDUCTING CLASSES FOR TRAINING, WORKSHOPS, EXCURSIONS, ETC. FOR PEOPLE OF DIFFERENT AGES, E.G., TEACHERS, STUDENTS, ELDERLY PEOPLE, BLIND PEOPLE, PEOPLE WITH COMBINED DISABILITIES, REGARDING:</p> <ul style="list-style-type: none"> <li>• the knowledge of flora, including rare and protected species, common species, invasive species or species of different habitats, knowledge of habitats and the diversity of vegetation,</li> <li>• diversity and the rules of protection of birds, bats, groups of insects, including bees</li> <li>• nature protection,</li> <li>• establishing a garden, basic gardening activities, selection of plants.</li> </ul>

## Protection of trees during investment implementation

**Description of offer:** Inventory of the dendroflora, description of the health status of trees, indications/guidance of methods of protecting trees during investment implementation, proposals for substitute plantings.

**Potential uses:** Investments—construction, extension, etc. carried out in tree-lined areas.

**Keywords:**

- dendroflora
- tree protection measures
- replacement plantings

**Action:**

- ☒ research service
- ☒ training and consulting offer



# FACULTY OF HUMANITIES

[www.wydzialhumanistyczny.ukw.edu.pl](http://www.wydzialhumanistyczny.ukw.edu.pl)

## The Authorities

### Dean

Prof. Małgorzata Świąćicka, Ph. D., D. Sc.

### Associate Dean for Science and Cooperation

Prof. Jacek Maciejewski, Ph. D., D. Sc.

### Associate Dean for Student Affairs

Janusz Golinowski, Ph. D., D. Sc., Associate Professor

### Associate Dean for Education Quality

Agnieszka Gołębiowska-Suchorska, Ph. D., D. Sc.

## Contact Information



ul. Jagiellońska 11,  
85-067 Bydgoszcz



52 32 21 638 w. 20



agachy@ukw.edu.pl



[www.wydzialhumanistyczny.ukw.edu.pl](http://www.wydzialhumanistyczny.ukw.edu.pl)

## Faculty Structure

- Institute of Polish Philology and Cultural Studies
- Institute of History and International Relations
- Institute of Political Sciences
- Institute of Modern Languages and Applied Linguistics
- Chair of Journalism, New Media and Civil Society Communication
- Chair of German Philology



## Brief Characteristics

**The Faculty of Humanities is a well-known research and educational unit of the Kazimierz Wielki University in Bydgoszcz, recognised both in Poland and abroad.**

It has a wide educational offer for students, doctoral students and post-graduate students. In recent years, the Faculty of Humanities has opened attractive courses of study, such as Humanities 2.0, Innovation and Public Management, Philology (with a specialty in Applied Linguistics: English and Chinese), Journalism and Civil Society Communication, and Cultural Studies. Other available courses of study are: History, Cultural Heritage Management and Protection, Political Science, International Relations, Polish Philology, Foreign Languages, etc.

This multi-profile faculty is distinguished by its modern theoretical and methodological foundations of research, and local, national and international research sources,

which determine its rank on the national and international scene. The research of individual units falls within the scope of the humanities and social sciences.

The faculty of the Institute of Polish Philology and Cultural Studies research various problems, both in the field of language and literature. The linguistic interests are focused on diachronic problems centred around the history of language against the background of national history and culture, with particular emphasis on the dialects of Pomerania and Kuyavia, and on the contemporary Polish language, including e.g. research of the idiolects of Polish writers, language and style in civil society communication. Literary research concerns the history of literature,





contemporary literature, analyses of the work of selected writers (e.g. Bolesław Prus, Zbigniew Herbert), and borderlands of literature and culture seen not only from the perspective of culture, but also anthropology. The Institute's faculty are also engaged in broadly defined cultural research, e.g. of totalitarian culture and Polish cinema.

Archaeology, history, art history and the teaching of history are the main disciplines of the employees of the Institute of History and International Relations. Their extensive research currently covers such fields as the history of material culture, ecclesiastical history, auxiliary sciences of history and the history of the Kuyavian-Pomeranian region and Polish-German relations in various periods of history.

Research carried out by research teams at the Institute of Political Sciences contributes to the development of two scientific disciplines: political science and European studies. The research activity of the unit is focused on investigating the determinants of political processes and phenomena, theory and practice of economic and social



policy and contemporary problems of national security.

The range of research interests of the staff of the



Institute of Modern Languages and Applied Linguistics is very broad. The research is carried out in three philological disciplines: linguistics, cultural studies and literature studies and considers English, German, Russian, Arabic and Chinese.

The Chair of Journalism, New Media and Civil Society Communication researches various aspects of communication studies, that is language communication, media discourse, promotion and public relations, and conducts media research.

The research work of the Chair of German Philology covers linguistics (including the problems of modern semantics, word formation, linguistic discourse analysis in research on

cultural texts and the media) and literature and cultural studies (German literature of the 20th and 21st centuries, German regional literature of the 19th and 20th centuries, with particular emphasis on the former Poznań Province, cultural theory of literature, and sociology of literature). The academic staff of the Faculty of Humanities consists of 192 employees, including 15 titular professors and 46 extraordinary associate professors.

The Faculty is authorised to grant the degree of 'doktor habilitowany' (D. Sc.) in History, Linguistics and Literature Studies, as well as the degree of 'doktor nauk humanistycznych' (Ph. D. in Humanities) in History, Linguistics, Literature Studies and Political Science.





# INSTITUTE OF POLISH PHILOLOGY AND CULTURAL STUDIES

[www.filologiapolska-kulturoznawstwo.ukw.edu.pl](http://www.filologiapolska-kulturoznawstwo.ukw.edu.pl)





# The Authorities

Magdalena Czachorowska, Ph. D., D. Sc.,  
Associate Professor

## Contact Information



ul. Jagiellońska 11,  
85-067 Bydgoszcz



52 32 13 181



skura-agnieszka@ukw.edu.pl



[www.filologiapolska-kulturoznawstwo.ukw.edu.pl](http://www.filologiapolska-kulturoznawstwo.ukw.edu.pl)

## Structure

- Chair of Grammar and Semantics
- Chair of Contemporary Culture
- Chair of World Literature and Comparative Literature Studies
- Chair of Stylistics and Pragmatics
- Department of Literature and Language Didactics
- Department of Historical and Cultural Linguistics
- Department of Old Literature and Editing
- Department of Polish Modern and Postmodern Literature (19th–21st centuries)
- Department of the Theory of Literature and Knowledge of Art

### Scientific and research issues:

The faculty of the Institute of Polish Philology and Cultural Studies research various problems, both in the field of language and literature.

#### The linguistic interests are focused on:

- syntax, semantics, pragmatics and stylistics of the contemporary Polish language,
- lexicology, phraseology and lexicography of cognitive linguistics (conceptual metaphor theory, axiology),
- sociolinguistics, psycholinguistics, cultural linguistics, intercultural communication and contrastive linguistics,
- the language of the media and advertising, colloquial language, borderland languages, language contact and influences,
- onomastics, dialectology and the history of language.

#### The research interests of literary scholars include in particular:

- old Polish literature (interpretation of old Polish literature in various cultural contexts),
- comparative studies (research is aimed at showing broad links between the history of literature, history, historiography and philosophy),
- literature of the 19th, 20th and 21st centuries and literature as a testimony to the transformation of European culture of the 19th and 20th centuries,
- description of Polish cinema in a historical perspective and in various (political, ideological, social, cultural, etc.) contexts,
- determining the relationships between semiotic systems in contemporary culture and the structures revealed in artistic expression,
- analysis and interpretation of religious and metaphysical contexts in selected contemporary cultural texts, with particular emphasis on film and literature.

#### Cooperation of the Institute of Polish Philology and Cultural Studies with the social and economic environment:

1. literary, art and film criticism,
2. practical stylistics,
3. problems of contemporary Polish language.

#### Possibilities – Experiences – Projects:

- occasional lectures during cultural events to promote the knowledge of the humanities,
- workshops on practical stylistics and the teaching of editing,
- book editing assistance,
- training, expert opinions, consultations and investigation of:
  - » the culture and pragmatics of official communication (shaping the linguistic relationship between the state and the citizen),
  - » linguistic aspects of communication design (PR, advertising, social media, analysis of cultural and social environment) for government, private and non-government sector organisations,
  - » the linguistic identity of a region,
  - » language consulting for public and private organisations (naming of public space facilities, companies, brands, and products, expert linguistic opinions on communication strategies, text editing assistance, assessment of the impact of communication solutions implemented, etc.),
  - » linguistic aspects of legal disputes (linguistic authentication of texts, expert linguistic opinions in criminal and civil cases, language consultancy in the field of copyright protection and protection of public rights, linguistic moderation of communication between an organisation and its environment, etc.),
  - » Polish language, cultural and social education of children, youth and adults (including older people).

## Chair of Grammar and Semantics

### Scientific and research issues:

The Chair of Grammar and Semantics conducts linguistic research on:

- the syntax and morphology of the contemporary Polish language,
- the meanings of lexemes in selected thematic fields,
- grammatical features of the style of Polish poetry and prose of the 20th and 21st centuries,
- Bydgoszcz city dialect and social dialects.

### SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	COOPERATION WITH AND SUBSTANTIVE CONSULTATIONS FOR: <ul style="list-style-type: none"> <li>• private entities,</li> <li>• public administration.</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• participation in the work of editorial boards and scholarly councils, award committees and language and literature competition juries, organising committees of various language and literature promotion projects,</li> <li>• development of expert language/linguistic opinions.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• lectures for teachers of the Polish language on phenomena in contemporary Polish and its variants (especially Bydgoszcz city dialect),</li> <li>• lectures for Bydgoszcz residents (e.g. about the Bydgoszcz dialect or Bydgoszcz in literature),</li> <li>• advice on linguistic correctness.</li> </ul>

## Chair of Contemporary Culture

### Scientific and research issues:

The research projects are centred around:

- description of Polish cinema in a historical perspective and in various (political, ideological, social, cultural, etc.) contexts,
- analysis and interpretation of religious and metaphysical contexts in selected contemporary cultural texts,
- links between Polish culture and 19th century technology.

### SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	<ul style="list-style-type: none"> <li>• scholarly cooperation and substantive consultations falling within the scope of the research of the unit.</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• cooperation with regional institutions in award committees, editorial boards and scientific councils, organising committees of various projects, competition juries, etc.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• consultancy, training and consultations on film criticism, any cinema-related texts and other cultural texts.</li> </ul>

## Chair of World Literature and Comparative Literature Studies

### Scientific and research issues:

The unit conducts research in the area of world literature and comparative studies, in particular in:

- historical novel and fantasy,
- myths of God and Nature as the narrative frameworks in various cultural texts, including literature (e.g. the motifs of Don Juan and Don Quixote) and didactics.

In addition, the Chair offers programmes in contemporary culture, principles of research work and journalism, including negotiation and mediation, journalistic rhetoric and specialised journalism (culture).

<b>SCIENTIFIC RESEARCH PROSPECTS</b>	
<b>Business cooperation offer</b>	<p>SUBSTANTIVE CONSULTATIONS AND PARTICIPATION IN EXPERT BODIES WITHIN THE SCOPE OF THE RESEARCH OF THE UNIT FOR REPRESENTATIVES OF:</p> <ul style="list-style-type: none"> <li>• culture, including film,</li> <li>• media and journalism,</li> <li>• education.</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• cooperation with institutions in award committees, editorial boards and scholarly councils, organising committees of various projects, competition juries, etc. for world literature and comparative studies.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• training for press and Internet journalists in editing cultural materials (information texts, reviews, cultural journalism, interviews, etc.),</li> <li>• lectures in Polish and world literature and comparative studies for students and teachers.</li> </ul>

## Chair of Stylistics and Pragmatics

### Scientific and research issues:

The Chair carries out scholarly tasks within the framework of statutory research and grants in the following research areas:

- linguistic genology,
- history of language,
- linguistic image of the world,
- communication studies,
- culture of language,
- lexicology and phraseology,
- cultural linguistics,
- onomastics,
- linguistic pragmatics,
- sociolinguistics,
- stylistics,
- linguistic textology.

Activities of the faculty also include membership in academic societies and language promotion and advice (e.g. as part of the faculty's membership in the Society of Friends of the Polish Language, expert comments in the media and participation in numerous local initiatives).

<b>SCIENTIFIC RESEARCH PROSPECTS</b>	
<b>Business cooperation offer</b>	<p>TRAINING SESSIONS, EXPERT OPINIONS, CONSULTATIONS AND STUDIES FOR GOVERNMENT, PRIVATE AND NON-GOVERNMENT SECTOR ORGANISATIONS; EXPERT SERVICES AND CONSULTANCY IN THE FIELD OF LINGUISTICS RESEARCH FOR:</p> <ul style="list-style-type: none"> <li>• offices,</li> <li>• courts,</li> <li>• entities engaged in marketing, advertising and PR.</li> </ul>

<b>Research services</b>	<p>OPINIONS, EXPERT OPINIONS, CONSULTATIONS AND INVESTIGATION OF:</p> <ul style="list-style-type: none"> <li>the culture and pragmatics of official communication (shaping the linguistic relationship between the state and the citizen),</li> <li>linguistic aspects of communication design (PR, advertising, social media, analysis of cultural and social environment),</li> <li>language consulting: naming of public space facilities, companies, brands, and products,</li> <li>expert linguistic opinions on communication strategies, text editing assistance, assessment of the impact of communication solutions implemented, etc.,</li> <li>linguistic aspects of legal disputes – linguistic authentication of texts, expert linguistic opinions in criminal and civil cases, language consultancy in the field of copyright protection and protection of public rights, linguistic moderation of communication between an organisation and its environment, etc.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>training and consultancy in the above areas.</li> </ul>

## Department of Literature and Language Didactics

### Scientific and research issues:

The areas of interest of the Department include the following selected subjects:

- idea, function and content of the core curriculum for the second, third and fourth stages of education,
- objectives of language, literature and culture education in primary, lower secondary and upper secondary schools,
- the place of teaching language and rhetoric in contemporary language education,
- preparation for the reception of works of literature and other cultural texts.

<b>SCIENTIFIC RESEARCH PROSPECTS</b>	
<b>Business cooperation offer</b>	<p>TRAINING, CONSULTATIONS AND RESEARCH IN THE FIELD OF POLISH LANGUAGE, CULTURAL AND SOCIAL EDUCATION OF CHILDREN, YOUTH AND ADULTS (INCLUDING OLDER PEOPLE) FOR:</p> <ul style="list-style-type: none"> <li>cultural institutions, schools and libraries in Poland,</li> <li>Polish centres and schools abroad.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>courses in activating teaching for teachers of Polish language,</li> <li>courses in library therapy for teachers, tutors, speech therapists and educators working in day care and after school facilities, boarding schools, etc.,</li> <li>courses for staff of different cultural institutions, e.g. libraries, cultural centres, publishing houses, etc., example: 'Polish Culture as the Heritage and Future of Polish Children Abroad – Promoting Polish Culture in Polish Community Centres Abroad',</li> <li>courses for teachers of Polish language, history, civics, in Poland and in Polish schools abroad,</li> <li>lectures for the school teacher community (upper secondary school level) on the dynamics of the development of literary studies at the turn of the 20th and 21st centuries and the knowledge about the image of literature from Romanticism to the present day,</li> </ul>

### Training and consulting services

- consultations for teachers on the teaching of literature from the 19th to the 21st centuries (updating academic and practical knowledge about particular literary eras, currents, trends, writers, etc., assistance in the preparation of original curricula).

## Department of Historical and Cultural Linguistics

### Scientific and research issues:

Research carried out by the faculty of the Department of Historical and Cultural Linguistics falls within the scope of:

- the history of the Polish language (old Polish and Polish dialects) and other Slavic languages,
- dialectology,
- ethnolinguistics,
- folklore studies and intercultural communication.

The Department has a **Laboratory of Polish and Regional Culture** engaged in the study of various manifestations of regionalism, promotion of research results in local communities and cooperation with cultural leaders in Kuyavia and Pomerania through contacts with regional associations (Instytut Kaszubski in Gdańsk, Instytut Kociński in Starogard Gdański, Instytut Dziedzictwa Kruszwicy, Towarzystwo Przyjaciół Dolnej Wisły, Towarzystwo Miłośników Wilna i Ziemi Wileńskiej, Rada Programowa Kocińskiego Magazynu Regionalnego).

### SCIENTIFIC RESEARCH PROSPECTS

#### Business cooperation offer

SUBSTANTIVE COOPERATION FALLING WITHIN THE SCOPE OF THE RESEARCH OF THE UNIT WITH:

- public entities, e.g. museums or archives,
- regional associations,
- private individuals.

#### Research services

EXPERT OPINIONS, CONSULTATIONS AND RESEARCH IN:

- the linguistic history and identity of the region,
- spelling and reading of Old and Middle Polish texts,
- translation of Old and Middle Polish texts,
- reading Old and Middle Polish texts,

RESEARCH IN THE FIELD OF SOCIAL IDENTITY AND REGIONAL DIVERSIFICATION OF CONTEMPORARY POLISH LANGUAGE.

#### Training and consulting services

- training and consultancy in the above areas.



## Department of Old Literature and Editing

### Scientific and research issues:

Areas of research and interest of the Department of Old Literature and Editing:

- old literature,
- academic editing (including the history and reception of selected editions),
- computer text processing.

The staff conduct source research on old literature (editions, analyses and interpretations), i.e. Medieval Latin historiography, Renaissance and Baroque theological and philosophical ideas, occasional poetry of the Enlightenment, and tragedy and novel of the late Enlightenment.

### SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	TRAINING SESSIONS AND SUBSTANTIVE CONSULTATIONS FOR: <ul style="list-style-type: none"> <li>• representatives of the publishing industry,</li> <li>• private individuals.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• 'Contexts of the Professions of an Editor and a Publisher' – training for literary and cultural publishing staff in current literary and artistic transformations, directions of development of contemporary knowledge of the humanities, culture, and literature (from the 19th to the 21st centuries) and film, to be used in professional their practice,</li> <li>• training sessions in editing of books and serials on the contemporary humanities and culture (scientific and literary texts and texts about literature and the relationship between literature and other fields of art, e.g. film),</li> <li>• courses on editing publishing series, specialist journals and other periodicals, including cultural and academic publications,</li> <li>• consultancy on the preparation of texts for peer-reviewed publications, scientific and editorial reviews.</li> </ul>

## Department of Polish Modern and Postmodern Literature (19th–21st centuries)

### Scientific and research issues:

The research projects conducted at the Department cover the key issues of the history of Polish literature, from Romanticism to contemporary literature, including:

- the reception of literature from the era of the People's Republic of Poland after 1989, Polish domestic and exile poetry on the topic of childhood, the vitality of selected genres, the poetry of authors of various generations after 1989, transformations of literary criticism at the turn of the 20th and 21st centuries,
- Polish literature of the 19th and 20th centuries, investigation of the links between literature and the visual arts, investigation of literary, visual and moral facts that contribute to the image of the 19th century mass culture,
- literature, culture and the worldview of Polish Positivism against the background of modernism and modernity as broad cultural formations; relations of literature, philosophy and religion with particular emphasis on the era of Positivism,
- religious themes in 20th century literature, Modernist literature, the symbolic meaning of blood in literature, selected aspects of contemporary literature, the phenomenon of phonicity in literary texts,
- the symbolism of colours in the poetry of Young Poland, spatial motifs in literature, the work of Adam Asnyk, Positivists and the Romantic tradition,
- relationships between literature with philosophy; Young Poland's reception of the thought of F. Nietzsche, poetic imagination, temporal themes in poetry and contemporary poetry.

### SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	<ul style="list-style-type: none"> <li>• cooperation with local government institutions within the scope of their cultural activity (consultancy, consultations, expert opinions, reviews, etc. e.g. of cultural and academic grants, awards, publishing and artistic projects, etc.),</li> <li>• cooperation with regional institutions in award committees, editorial boards and scientific councils, organising committees of various projects, competition juries, etc.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• seminars in playwriting and the creation of other literary texts (e.g. essays, fiction),</li> <li>• lectures, or cycles of lectures on a common topic, (and other forms of the promotion of knowledge) on literature and relations between literature and culture and science (film, theatre, graphic arts, philosophy), from the 19th century to the present, for schools or cultural institutions of the region (cultural centres, libraries, museums, etc.).</li> </ul>

## Department of the Theory of Literature and Knowledge of Art

### Scientific and research issues:

Topics considered by this unit cover vast areas of literature and art. At the same time, however, all research initiatives are characterised by sensitivity to anthropological issues and the interpenetration of various forms of human presence in the world. Hence the particular importance of historical and cultural contexts in these works.

The Department conducts research in the field of:

- anthropology of literature and theatre,
- history of contemporary literature,
- cultural campanology,
- genology,
- history of architecture,
- fashion and design in culture

and

- carries out research programmes on anthropology in literature, art and folk forms.

### SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	<p>TRAINING, COURSES AND CONSULTANCY ON INTERPRETATION OF CULTURAL TEXTS FOR:</p> <ul style="list-style-type: none"> <li>• public entities,</li> <li>• regional associations,</li> <li>• private companies.</li> </ul>
<b>Research services</b>	<p>PRACTICAL APPLICATION OF RESEARCH PROBLEMS TO:</p> <ul style="list-style-type: none"> <li>• analyses and expert opinions on the interpretation of cultural texts (media, commerce, services, etc.),</li> <li>• participation in Revitalization of Small Sacred Architecture projects; Example: involvement in revitalization work on the Chapel of St. Anthony in Mąkolno and the Chapel of St. Anna in Złoty Stok, in cooperation with the Students' Literary Journey Group,</li> <li>• reviews in theatre and literature studies.</li> </ul>

## Training and consulting services

### COOPERATION WITH REGIONAL INSTITUTIONS ON THE PROMOTION OF LEARNING:

- lectures for senior citizens at Universities of the Third Age,
- lectures for secondary school students,
- lectures for other audiences interested in culture, literature and art;

TRAINING SESSIONS AND CONSULTATIONS IN THE PREPARATION OF PUBLIC SPEECHES.





# **INSTITUTE OF HISTORY AND INTERNATIONAL RELATIONS**

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## The Authorities

Marek Zieliński, Ph. D., D. Sc., Associate Professor

## Contact Information



ul. Poniatowskiego 12,  
85-671 Bydgoszcz



52 32 59 200



historia2@ukw.edu.pl



www.ihism.ukw.edu.pl

## Structure

- Chair of Archaeology and Ancient Civilisations
- Chair of History and International Relations of the 19th and 20th Centuries
- Chair of Medieval History
- Chair of the Auxiliary Sciences of History and the History of Historiography
- Department of the Teaching of History and European Education
- Department of Contemporary History of Poland
- Department of Contemporary World History and the History of Migration
- Department of Modern History
- Department of the History of Art and Culture

### Scientific and research issues:

Research activities of the faculty of the Institute of History and International Relations are very diverse. The unit employs a highly qualified staff of 35: historians, archaeologists, art historians and specialists in political sciences, philosophy, law and economics.

The research interests in the basic disciplines of archaeology, history, history of art and the teaching of history are centred around the following specific problems:



- the prehistoric archaeology of the Polish lands,
- research on settlement, economy and social relations in the context of prehistoric archaeology of Europe,
- antiquity, with particular emphasis on Roman history, the history of religion, the symbolism of power, changes in the administration of the empire, and economy of the Danube region,
- research in the cultural history of the Middle Ages and the history of the Church,
- prosopographical research of ecclesiastical circles,
- traditions, myths and rituals in medieval Europe,
- research in certain auxiliary sciences of history,
- diplomatics,
- dynastic genealogy and heraldry,
- research on the history of Poland against the background of world history of the 16th–18th centuries,
- the history of Old Polish culture,
- the history of the Church and of religiousness in the post-Tridentine period,
- research in the field of culture of the Renaissance courts of the last Jagiellons,
- the history of cities, with special attention paid to the Old Polish era,
- culture during the reign of King Stanisław August,
- the history of cities and their organisation, demography and hygiene,
- international relations in the world in the 20th and 21st centuries,
- the history of the Kuyavian-Pomeranian region in the 20th century, including national minorities and local communities,
- research on opposition and social resistance in Poland and the region after 1945,
- Polish economic transformation after 1989,
- research on the links between regional and local history and young people's historical awareness,
- historical sources in historical education,
- issues related to the history of 20th century Poland, Polish-German relations and Polish Western thought in the 20th century, and the history of Polish emigration in Great Britain,
- preparation of thematic paths for regional historical education,
- development of regional monographs,
- legal and historical aspects of the history of the judiciary in Poland in the years 1945–1956 and the punishment of war criminals in Poland and Eastern European countries,
- edition of auxiliary sources for school curricula,
- cooperation with schools and local government institutions in the area of historical education,
- international relations in the 19th and 20th centuries, including Polish-German, Polish-Austrian and Polish-French relations,
- research and documentation of the functioning of Polish consular services.

## Chair of Archaeology and Ancient Civilisations

### Scientific and research issues:

The Chair of Archaeology and Ancient Civilisations conducts research in the prehistoric archaeology of the Polish lands. The research focuses on the settlement, economy and social relations in the context of the prehistoric archaeology of Europe.



## SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	COOPERATION WITH AND SUBSTANTIVE CONSULTATIONS FOR: <ul style="list-style-type: none"> <li>• private entities,</li> <li>• public administration.</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• participation in the work of editorial boards,</li> <li>• cooperation in consultative bodies,</li> <li>• expert opinions in the field of archaeology.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• lectures,</li> <li>• assistance in the organisation of archaeological events.</li> </ul>

# Chair of History and International Relations of the 19th and 20th Centuries + Department of the Teaching of History and European Education + Department of the History of Art and Culture: research group

### Scientific and research issues:

Research of the Chair of History and International Relations of the 19th and 20th Centuries focuses on international relations in the 19th and 20th centuries, including Polish-German, Polish-Austrian and Polish-French relations.

The faculty of the Department of the Teaching of History and European Education conduct research on the links between regional and local history and young people's historical awareness. Another direction of research are legal and historical problems (the history of the judiciary in Poland in the years 1945-1956 and the punishment of war criminals in Poland and Eastern European countries).

Research problems include: shaping the image of the neighbour and neighbourly relations: Polish-Russian relations in school textbooks; historical sources (including film) in historical education, and edition of auxiliary sources for school curricula.

The Department of the History of Art and Culture conducts research on various aspects of the history of culture (both elite and mass culture) in the everyday life and material culture of broad strata of society. The aim of the research is to identify the processes of shaping and protecting cultural heritage on a European, national and regional scale. Heritage is defined very broadly. Apart from works of art, areas of interest include also the worldview, landscape, 'the world of material things', monuments of literature and colloquial language, are technical, industrial and culinary heritage.

The faculty of these units specialise jointly in regional research, mainly on the history of Bydgoszcz in the 19th and 20th centuries.

## SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	<p>RESEARCH SERVICES, CONSORTIA, PROJECTS, AND PUBLICATIONS IN COOPERATION WITH:</p> <ul style="list-style-type: none"> <li>• local government administration,</li> <li>• national administration,</li> <li>• cultural institutions.</li> </ul>
<b>Research services</b>	<p>SERVICES THAT CORRESPOND TO THE METHODOLOGY AND RESEARCH TECHNIQUE OF HISTORICAL SCIENCES:</p> <ul style="list-style-type: none"> <li>• bibliographic and archival research,</li> <li>• participation in the work of editorial boards,</li> <li>• publications (also as preparation of substantive materials for web portals),</li> <li>• expert opinions.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• lectures and papers,</li> <li>• participation in award committees and juries in competitions about Bydgoszcz,</li> <li>• assistance in the organization of events promoting the history of Bydgoszcz.</li> </ul>

# Department of Modern History + Chair of the Auxiliary Sciences of History and the History of Historiography + Department of the Teaching of History and European Education + Department of the History of Art and Culture + Department of Contemporary History of Poland: research group

### Scientific and research issues:

The Department of Modern History conducts research in the field of the history of Poland against the background of world history of the 16th–18th centuries. Research covers the history of Old Polish culture, the history of education, and the history of the Church and religiousness in the post-Tridentine period. Research is conducted in the field of culture of the Renaissance royal courts of the last Jagiellons, the reign of King Stanisław August, the history of cities and their organisation, demography and hygiene. The research process of the faculty includes the graffiti evidence of the afterlife and demons in the post-Tridentine mass religiosity in Poland, and biographical writings, civilisation-al and regional space.

The Chair of the Auxiliary Sciences of History and the History of Historiography conducts research in certain auxiliary sciences of history and diplomatics (document formats), dynastic genealogy (the Russian Rurik dynasty) and heraldry. The faculty investigate the development of Medieval Polish historiography and source analysis (Jan Długosz's Annals) and the history of ideas. The published works cover the history of the Church in the Middle Ages and modern times (religious orders and monasteries), the history of Kuyavia and economic history.

The research projects carried out by the faculty of the Department of Contemporary History of Poland is centred around issues related to the history of 20th century Poland, Polish-German relations and Polish Western thought in the 20th century, and the history of Polish emigration in Great Britain.

Investigations focus on the history of the Kuyavian-Pomeranian region in the 20th century, including national minorities and local communities. Research is also conducted on opposition and social resistance in Poland and the region after 1945 and Polish economic transformation after 1989. Department of the Teaching of History and European Education + Department of the History of Art and Culture – see above.

The faculty of these units specialise jointly in the research in the history, social structures and cultural heritage of the towns and cities of Kuyavia, Pomerania, Chełmno Land and Dobrzyń Land.

## SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	<p>RESEARCH SERVICES, CONSORTIA, PROJECTS, AND PUBLICATIONS IN COOPERATION WITH:</p> <ul style="list-style-type: none"> <li>• local government administration,</li> <li>• national administration,</li> <li>• cultural institutions.</li> </ul>
<b>Research services</b>	<p>SERVICES THAT CORRESPOND TO THE METHODOLOGY AND RESEARCH TECHNIQUE OF HISTORICAL SCIENCES:</p> <ul style="list-style-type: none"> <li>• bibliographic and archival research,</li> <li>• participation in the work of editorial boards,</li> <li>• cooperation in consultative bodies,</li> <li>• publications (also as preparation of substantive materials for web portals),</li> <li>• expert opinions.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• lectures,</li> <li>• participation in award committees and juries in competitions about the towns and cities of Kuyavia, Pomerania, Chełmno Land and Dobrzyń Land,</li> <li>• assistance in the organization of events promoting the history of town and cities.</li> </ul>





# **INSTITUTE OF POLITICAL SCIENCES**

[www.naukipolityczne.ukw.edu.pl](http://www.naukipolityczne.ukw.edu.pl)



## The Authorities

Jan Waskan, Ph. D., D. Sc., Associate Professor

## Contact Information



ul. Poniatowskiego 12,  
85-671 Bydgoszcz



52 32 59 230



polityka@ukw.edu.pl



[www.naukipolityczne.ukw.edu.pl](http://www.naukipolityczne.ukw.edu.pl)

## Structure

- Department of the History of Polonia and Migration Movements
- Department of the History of Political Thought and Social Movements
- Department of Sustainable Development Policy
- Department of the Sociology of Politics and Social Communication
- Department of International Relations
- Department of Political Theory
- Department of Contemporary Political Systems



## Scientific and research issues:

The research areas undertaken by the seven departments of the Institute include:

- policies at a local level (local community, local and regional authorities, and political actors),
- the phenomenon of ideological convergence and problems of the political system and transformations of public consciousness,
- problems of public communication,
- conditions of public and social innovation,
- neurobiological determinants of political processes and phenomena,
- theory and practice of economic and social policy,
- foundations of sustainable development and its implementation through specific policies,
- contemporary problems of national security,
- ideological, programming and normative institutionalisation of political parties; leadership in contemporary political parties,
- modifications of the Polish political system after 1989,
- changes of the normative subsystem and to the political system of the People's Republic of Poland,
- contemporary problems of Germany in European relations,
- the theory and methodology of politics and the role of political elites in the structure of the political system,
- Polish political thought in the 20th and 21st centuries.



## Possibilities – Experiences – Projects

Cooperation of the Institute of Political Sciences with the social and economic environment:

- surveys/opinion polls regarding the perception of the image of operations/investments of companies/institutions, in particular their impact on the local ecosystem or the public sense of environmental threat,
- research on the effectiveness of companies in implementing environmental marketing strategies
- and 'green public relations', and adopted concepts of building Corporate Social Responsibility,
- training on innovation strategies and innovation leaders,
- analysis of audience attitudes and preferences,
- measurement of message understanding,
- measurement of message recollection and audience behaviour,
- training in negotiations, marketing and advertising, personal presentation techniques and procedures,
- Public Relations,
- consultancy on the development and implementation of CSR strategies for enterprises,
- consultancy on socialisation of environmental protection in the company
- training sessions in effective environmental communication with the external corporate environment (especially the local environment in which a project involving an interference with the local ecosystem has been or is to be located),
- training sessions in the implementation of the idea of sustainable development in internal corporate communication,
- consultancy on the creation of sustainable spatial planning and management of related social resources,
- training sessions in the environmental marketing of products and services,
- analysis of social and political awareness and its impact on consumer attitudes and B2B relations,
- analysis of new social and political movements,
- analysis of political attitudes and voting behaviours: election forecasts,
- evaluation of research results in the field of political thought and social movements,
- evaluation of technology achievements in terms of opportunities and barriers for social, political and civilisational development,
- evaluation of the quality of cooperation between national/ local government institutions and non-governmental organisations,
- analysis of the activities of public and local government authorities, and legal and political solutions in terms of their defects as a possible source of corruption and threats to the system under consideration,
- analysis of social and political threats for the selected social system and subsystem,
- evaluations, analyses and expert opinions for the media on: identification of the sources of political attitudes and behaviours, new social movements, impact of technologies on social and political development, threat assessment of identified globalisation factors to social and political development.

## Department of Sustainable Development Policy

### Scientific and research issues:

The Department of Sustainable Development Policy conducts research in the field of sustainable development in contemporary international, EU and national policy, implemented both at national and local levels, and in particular:

- environmental awareness and attitudes in the society,
- sustainable development in administrative and economic activities.

### SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	<p>RESEARCH SERVICES ARE OFFERED TO ALL ENTITIES INTERESTED IN SUSTAINABLE DEVELOPMENT, INCLUDING:</p> <ul style="list-style-type: none"> <li>• public institutions,</li> <li>• private companies,</li> <li>• advertising and marketing.</li> </ul>
<b>Research services</b>	<p>PRACTICAL APPLICATION OF RESEARCH:</p> <ul style="list-style-type: none"> <li>• surveys/opinion polls regarding the perception of the image of operations/investments of companies/institutions, in particular their impact on the local ecosystem or the public sense of environmental threat,</li> <li>• research on the effectiveness of companies in implementing environmental marketing strategies and 'green public relations.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• consultancy on the development and implementation of CSR strategies for enterprises,</li> <li>• consultancy on socialisation of environmental protection in the company (in the context of implementation of the Eco-Management and Audit Scheme, EMAS),</li> <li>• training sessions in effective environmental communication with the external corporate environment (especially the local environment in which a project involving an interference with the local ecosystem has been or is to be located),</li> <li>• training sessions in the implementation of the idea of sustainable development in internal corporate communication,</li> <li>• consultancy on the creation of sustainable spatial planning and management of related social resources,</li> <li>• training sessions in the environmental marketing of products and services.</li> </ul>

## Department of the Sociology of Politics and Economy

### Scientific and research issues:

The Department of the Sociology of Politics and Economy conducts research in the area of social and economic changes, in particular in:

- management of non-profit institutions,
- communication in the mass media,
- the challenges of innovation in the public sphere,
- local labour markets and entrepreneurship.

### SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	ANALYTICAL SERVICES, EXPERT OPINIONS AND CONSULTANCY ON IMAGE BUILDING, LOCAL ENTREPRENEURSHIP SCHEMES, AND PROMOTIONAL AND ELECTION CAMPAIGNS FOR REPRESENTATIVES OF: <ul style="list-style-type: none"> <li>• marketing and the media,</li> <li>• interested parties from the business sphere,</li> <li>• public administration.</li> </ul>
<b>Research services</b>	PRACTICAL IMPLEMENTATION OF RESEARCH IN THE FORM OF: <ul style="list-style-type: none"> <li>• analysis of audience attitudes and preferences,</li> <li>• measurement of message understanding,</li> <li>• measurement of message recollection and audience behaviour,</li> <li>• analysis and evaluation of the media image of individuals, companies and institutions.</li> </ul>
<b>Training and consulting services</b>	TRAINING SESSIONS IN: <ul style="list-style-type: none"> <li>• negotiations,</li> <li>• marketing and advertising,</li> <li>• personal presentation techniques and procedures,</li> <li>• Public Relations.</li> </ul>

## Department of the History of Political Thought and Social Movements

### Scientific and research issues:

The Department of the History of Political Thought and Social Movements conducts research in political thought and social movements, in particular in:

- aspects of Polish political thought in the 20th and 21st centuries,
- development of nationalistic, Catholic and folklore thought and ideological convergence,
- transformations of social and political awareness in the 20th and 21st centuries under the pressure of technological development and ideological currents,
- changes in the Polish elites and their political attitudes,
- political attitudes and voting behaviours in Poland and abroad,

- the impact of political thought on the understanding and implementation of security at local, national, regional and international levels,
- new political movements in the 21st century,
- relations between the state and local government; non-governmental organisations in Poland,
- systemic analysis, with a specific assessment of security systems and their resilience to threats,
- propaganda and marketing in politics.

## SCIENTIFIC RESEARCH PROSPECTS

### Business cooperation offer

ANALYTICAL SERVICES, EXPERT OPINIONS AND TRAINING SESSIONS FOR REPRESENTATIVES OF:

- commerce: transformations of social and political awareness, impact of these phenomena on consumer attitudes and B2B relations, and analysis of a selected market in terms of cultural, political and social adequacy for planned services or products, or opportunities for and barriers to establishing business relations,
- national administration and justice: analysis of social movements, their programmes and attitudes in the public sphere, expert opinions on relations modelling and models of financing of non-governmental organisations and creating civic budgets, expert opinions for national security institutions in the form of assessments and analyses of new social movements, their objectives and ideological assumptions, assessments of crisis management systems, and assessments of the effects of internal and external migrations on selected communities,
- political organisations and trade unions: consulting in election campaigns, in creating a conceptual framework of activities and in defining objectives in relation to barriers and opportunities created by the social and political environment (identification of needs, assessment of threats and opportunities for action, image building),
- science and technology development: analyses, expert opinions and assessments of research results in the field of political thought and social movements, assessment of opportunities and threats created by specific technical achievements for social and political governance,
- services for research agencies: commissions to investigate political attitudes and voting behaviours and assessment of the degree of social and political awareness.

### Research services

ANALYSES AND EXPERT OPINIONS ON:

- analysis of social and political awareness and its impact on consumer attitudes and B2B relations,
- analysis of new social and political movements,
- analysis of political attitudes and voting behaviours: election forecasts,
- evaluation of research results in the field of political thought and social movements,
- evaluation of technology achievements in terms of opportunities and barriers for social, political and civilisational development,
- evaluation of the quality of cooperation between national/ local government institutions and non-governmental organisations,
- evaluation of the quality of cooperation between business management and trade unions,
- analysis of the activities of public and local government authorities, and legal and political solutions in terms of their defects as a possible source of corruption and threats to the system under consideration,
- analysis of social and political threats for the selected social system and subsystem,
- evaluations, analyses and expert opinions for the media on: identification of the sources of political attitudes and behaviours, new social movements, impact of technologies on social and political development, threat assessment of identified globalisation factors to social and political development.



# **INSTITUTE OF MODERN LANGUAGES AND APPLIED LINGUISTICS**

[www.neofilologia.ukw.edu.pl](http://www.neofilologia.ukw.edu.pl)



## The Authorities

Prof. Jolanta Mędelaska-Guz, Ph. D., D. Sc.

## Contact Information



ul. Grabowa 2,  
85-601 Bydgoszcz



52 341 14 02, wew. 42



neofil@ukw.edu.pl



[www.neofilologia.ukw.edu.pl](http://www.neofilologia.ukw.edu.pl)

## Structure

- Chair of Research on Baltic-Slavic Language Contacts
- Department of Russian Literature and Culture
- Department of Applied Linguistics
- Laboratory of Chinese Language and Culture
- Department of Arabic Language and Culture
- Department of Onomastics and History of the Russian Language
- Centre for Foreign Languages
  - » Russian
  - » German
  - » English
- Chair of English Philology
  - » Laboratory of Visual Literature

**Scientific and research issues:**

The research interests of the Institute represent a broad spectrum of topics in three philological disciplines: linguistics, cultural studies and literature studies and consider English, German, Russian, Arabic and Chinese.

Examples of research areas are:

- lexicography,
- lexicology,
- onomastics,
- sociolinguistics,
- theory and practice of translation,
- history of literature and contemporary literature,
- cognitive poetics,
- emigration problems,
- genology,
- film studies,
- culture of the Arab world.









# **CHAIR OF JOURNALISM, NEW MEDIA AND CIVIL SOCIETY COMMUNICATION**

[www.dziennikarstwo.ukw.edu.pl](http://www.dziennikarstwo.ukw.edu.pl)



## The Authorities

Radosław Sajna, Ph. D., D. Sc.

## Contact Information



ul. Ogińskiego 16,  
85-601 Bydgoszcz



52 32 36 760



dziks@ukw.edu.pl



[www.dziennikarstwo.ukw.edu.pl](http://www.dziennikarstwo.ukw.edu.pl)

## Structure

- Humanities 2.0 Laboratory
- Journalism Laboratory
- Department of Language Communication and Media Discourse
- Department of Political Communication and Media Research



**Scientific and research issues:**

The unit researches various aspects of communication studies, that is language communication, media discourse, political communication, advertising, promotion and PR. In addition, research is carried out into the media, including media systems, journalism and new media, the problems of digitisation and gamification (various types of games).



## Department of Language Communication and Media Discourse

**Scientific and research issues:**

The Department of Language Communication and Media Discourse is involved in research and teaching of communication studies and focuses on:

- language of values,
- communication ethics and axiolinguistics,
- the language of the media,
- language communication: language in interaction,
- pragmalinguistic analysis,
- the language of politics and ideology,
- analysis of media discourse,
- corpus approach to discourse analysis,
- film translations (from/to Polish and English),
- reception research (study of reading and reception of works and authors): the second half of the 20th century, especially the post-war decade,
- research in literary and social communication (constructing and functioning of literary and social communication systems; 'scenes' and 'circles' of literary/cultural/social life),
- social and cultural press, social and cultural journalism and literature: the second half of the 20th century, especially the post-war decade.

### SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	<p>COMMISSIONS, EXPERT OPINIONS AND SUBSTANTIVE CONSULTATIONS FOR COMPANIES ENGAGED IN:</p> <ul style="list-style-type: none"> <li>• traditional media and the Internet,</li> <li>• advertising and PR,</li> <li>• culture, literature and film.</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• expert language opinions on texts submitted,</li> <li>• linguistic opinions (language expertise),</li> <li>• proofreading of Polish texts (editorial, stylistic and linguistic corrections),</li> <li>• proofreading of English texts (editorial, stylistic and linguistic corrections),</li> <li>• subtitling of feature films and documentaries.</li> </ul>
<b>Training and consulting services</b>	<p>TRAINING SESSIONS IN:</p> <ul style="list-style-type: none"> <li>• verbal and non-verbal (interpersonal and public) communication,</li> <li>• improving Polish language competences.</li> </ul>

# Department of Political Communication and Media Research

## Scientific and research issues:

The Department of Political Communication and Media Research carries out research in political communication and media studies, in particular on:

- media systems,
- international and global communication,
- contemporary journalism, in particular: investigative and interventional journalism, online journalism, sports journalism and civic journalism,
- relations between the media and politics, media as instruments of political power, media as the fourth power, and political marketing,
- the ethics of journalism and the media, PR and advertising,
- promotion of towns/cities, regions and countries,
- mediatization, convergence and tabloidisation of the media,
- new media, Internet communication (e-communication and social media).

## SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	<p>ANALYTICAL SERVICES, EXPERT OPINIONS AND CONSULTANCY FOR ENTITIES ACTIVE IN:</p> <ul style="list-style-type: none"> <li>• traditional media and the Internet,</li> <li>• advertising and PR,</li> <li>• politics</li> </ul> <p>and</p> <ul style="list-style-type: none"> <li>• public institutions, including local/regional authorities,</li> <li>• non-governmental organisations,</li> <li>• companies from sectors where the image is important for the activity.</li> </ul>
<b>Research services</b>	<p>EXPERT OPINIONS, ANALYSES AND STRATEGIES IN:</p> <ul style="list-style-type: none"> <li>• relations between the media and politics, political communication and political marketing,</li> <li>• international communication and environmental/ecological communication,</li> <li>• online journalism,</li> <li>• media research concerning the operation of a company, organisation, town/city/region or unit in the media and its perception in the environment,</li> <li>• media monitoring for companies and organizations,</li> <li>• communication strategies for the media, institutions, organisations and associations involved in communication.</li> </ul>
<b>Training and consulting services</b>	<p>TRAINING AND CONSULTANCY IN:</p> <ul style="list-style-type: none"> <li>• political communication,</li> <li>• international communication (e.g. in politics and business, especially in Polish-Spanish relations),</li> <li>• media education,</li> <li>• media image design and communication,</li> <li>• building a positive image in the environment / the media – for companies, organisations, private individuals active in the public sphere (Public Relations),</li> <li>• development and implementation of advertising and promotional campaigns,</li> <li>• promotion of towns, cities and regions,</li> <li>• network communication and media crisis management.</li> </ul>

# Journalism Laboratory

## Scientific and research issues:

The Journalism Laboratory conducts research on the media and social communication, including communication between the sender and the recipient by means of sound and image, multimedia technologies, multimedia interfaces and the emission of such signals in digital systems, and in particular on:

- studio technology:
  - » recording of sound and video,
  - » editing and mixing of recordings,
  - » sound and image post-production in the journalist's work,
  - » multi-channel sound systems,
  - » Internet radio,
- analysis and processing of audio signals:
  - » reconstruction of recorded sound,
  - » sound recognition and classification,
  - » sound processing (DSP),
  - » audio and video streaming on the Internet,
- analysis of sound processing in digital broadcasting systems:
  - » sound quality assessment,
  - » methods of communication with the recipient,
  - » added services (PAD),
  - » interactivity in digital sound broadcasting systems,
- mobile technology:
  - » new forms of media content communication,
  - » convergence of multimedia services,
- new media interface:
  - » methods of selection, development and construction of multimedia journalistic content,
  - » key technology trends affecting the journalist's work.

Professional technical facilities of the Chair of Journalism, New Media and Civil Society Communication:

- a radio room equipped with a console, sound recorders and computers with sound editing software,
- a television room equipped with lighting, professional Sony cameras and a vision mixer,
- television studio equipped with computers for image editing.

## SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	<p>COMMISSIONS IN MEDIA COMMUNICATIONS (IN A BROAD SENSE) FOR:</p> <ul style="list-style-type: none"> <li>• radio stations,</li> <li>• television stations and their regional branches,</li> <li>• Internet media and online journalism,</li> <li>• public institutions,</li> <li>• advertising and promotion agencies,</li> <li>• other companies.</li> </ul>
<b>Research services</b>	<p>A PROJECT TEAM (I.E. STUDENTS SUPERVISED BY THE FACULTY) CAN:</p> <ul style="list-style-type: none"> <li>• prepare sponsored articles for publication in the press and on the Internet,</li> <li>• produce a commercial or a promotional film in accordance with a scenario proposed by the customer or prepared as a scenario service of an UKW team,</li> <li>• produce a sponsored interview using images of a TVP studio.</li> </ul>
<b>Training and consulting services</b>	<p>CONSULTANCY AND SUBSTANTIVE CONSULTATIONS IN:</p> <ul style="list-style-type: none"> <li>• creating texts to be used by and/or in the media,</li> <li>• editing press articles and public relations releases (especially in the field of media relations),</li> </ul>

<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• organisation of media relations,</li> <li>• public and media appearances,</li> <li>• promotion of events organised by an institution;</li> </ul> <p>TRAINING SESSIONS IN:</p> <ul style="list-style-type: none"> <li>• modern methods of communication between the sender and the receiver,</li> <li>• classification, characteristics and properties of sound,</li> <li>• digital audio broadcasting (DAB+),</li> <li>• modern sound production systems in the work of a radio journalist,</li> <li>• camera operation and professional recording of events.</li> </ul>
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## Humanities 2.0 Laboratory

### Scientific and research issues:

The research activity of the Humanities 2.0 Laboratory focuses on research on creating and designing games and their role in contemporary culture, society and business. Investigations focus e.g. on such specific problems as:

- players and their functioning in the context of different games,
- the effectiveness of gamification tools in education and management.

The teaching and research process is also based on close cooperation with partners from the video, analogue and training game industry.

SCIENTIFIC RESEARCH PROSPECTS	
<b>Business cooperation offer</b>	<p>TOPICS INVESTIGATED IN RESEARCH PROJECTS AS USED IN THE BUSINESS PRACTICE:</p> <ul style="list-style-type: none"> <li>• companies, organisations and public institutions active in new media.</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• gamification and design of games on many platforms: board and card games, LARP and narrative games, educational games, urban games and ARG, video games.</li> </ul>
<b>Training and consulting services</b>	<p>TRAINING SESSIONS AND SUBSTANTIVE CONSULTANCY IN:</p> <ul style="list-style-type: none"> <li>• gamification and game design,</li> <li>• network security.</li> </ul>

## Criminal pub game: an example

**Description:** Development of the idea for a criminal game to be played in a pub with the participation of an unlimited number of teams of 3 to 7 persons. During the game, each team will play the role of a fledgling detective agency. All the agencies are called upon to solve the mystery of a murder at a gloomy English estate. Only one of them can win and be the first to solve the mystery of a bloody crime.

**Possible uses:** Pubs, clubs, escape rooms – element of a creative entertainment space.

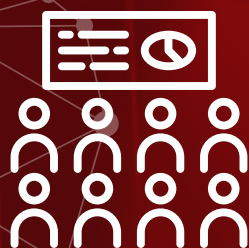
### Keywords:

- game
- entertainment

### Action:

- ☒ research service

**Additional information:** Development of a different version of the game adapted to the requirements and age of users.



# FACULTY OF PEDAGOGY AND PSYCHOLOGY

[www.wydzialpedagogikiipsychologii.ukw.edu.pl](http://www.wydzialpedagogikiipsychologii.ukw.edu.pl)





## The Authorities

### Dean

Prof. Ewa Zwolińska, Ph. D., D. Sc.

### Associate Dean for Science Affairs

Paweł Izdebski, Ph. D., D. Sc., Associate Professor

### Associate Dean for Student Affairs

Iwona Mandrzejewska-Smól, Ph. D.

### Associate Dean for Teaching Quality

Anna Jakubowicz-Bryx, Ph. D., D. Sc.,  
Associate Professor

## Contact Information



ul. Chodkiewicza 30,  
85-064 Bydgoszcz



52 34 19 314



psychped@ukw.edu.pl



[www.wydzialpedagogikiipsychologii.ukw.edu.pl](http://www.wydzialpedagogikiipsychologii.ukw.edu.pl)

## Faculty Structure

- Institute of Pedagogy
- Institute of Psychology

## Short Description of the Faculty

**The Faculty of Pedagogy and Psychology (FPP) is one of the most important centres of thought in pedagogy and psychology among the Polish institutions of higher education.**

The FPP, as an organisational unit of the University, is focused on dynamic development, broadening the scope of research and adapting the teaching offer to the socio-economic needs.

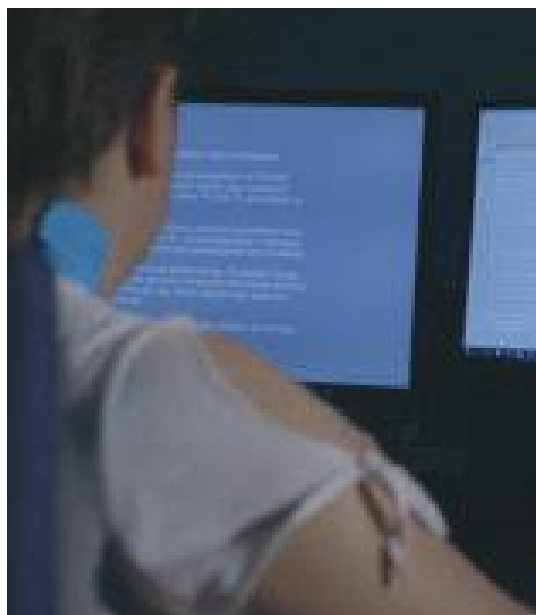
The Faculty teaches students in five majors: pedagogy (different specialities), early years pedagogy, logopaedics, social work and psychology. Its graduates are prepared for their professional career as highly skilled and entrepreneurial people able to take the initiative and

succeed on the competitive labour market.

The faculty conducts research in social sciences, thereby responding to the educational challenges of the society, region or country. Studies carried out by the scientific-teaching staff of the Institute of Pedagogy regard important issues of many scientific disciplines: intercultural education, cultural studies, cultural anthropology, social pedagogy, andragogy, history of education, preschool and early years pedagogy, didactics, pedeutolo-





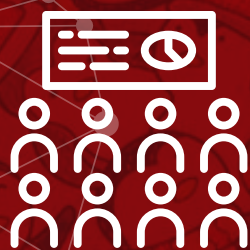


gy, and even art studies.

The profile of the scientific activities of the Institute of Psychology is shaped by research topics in the areas of psychology of human development, social psychology, clinical psychology and occupational psychology, which along with the development of the research are constantly expanded staff are continuously expanded within the various branches of applied sciences, such as psychology of health and quality of life or sports psychology. The Faculty of Pedagogy and Psychology continuously expands and updates its research programmes and contents of study curricula, with emphasis on interdis-

ciplinarity and internationalisation. The research staff, PhD and undergraduate students form a friendly environment that is open for the city and the region, implementing various scientific, educational and cultural initiatives. The employees enhance their links with the business environment, contributing to the establishment of a favourable climate for symbiosis with science and education.

The Faculty is entitled to grant doctoral degrees in pedagogy and psychology, and the degree of habilitated doctor in pedagogy.



# **INSTITUTE OF PEDAGOGY**

[www.pedagogika.ukw.edu.pl](http://www.pedagogika.ukw.edu.pl)

## The Authorities

Prof. Ryszard Gerlach, Ph. D., D. Sc.

## Contact Information



ul. Chodkiewicz 30,  
85-064 Bydgoszcz



52 34 19 308



inped@ukw.edu.pl



www.pedagogika.ukw.edu.pl



## Structure

- Chair of Didactics and Culture of Education Studies
- Chair of Musical Education
- Chair of General and Comparative Pedagogy
- Chair of Care Pedagogy and Social Prevention
- Chair of Labour Pedagogy and Andragogy
- Department of Philosophy of Education and Civil Education
- Department of Research Methodology and Discourse Studies
- Department of Social Thought and Environmental Education
- Department of Special Pedagogy and Speech Therapy
- Department of Social Pedagogy
- Department of Early Education and Preschool Pedagogy
- Department of Sociology of Education and Resocialisation
- Department of Theory of Education and Teaching Deontology



**Scientific and research issues:**

The Institute of Pedagogy conducts intensive research and scientific activities in the fields represented by each department and institute, and in cooperation between institutes. The main research topics at the Institute of Pedagogy are:



- sustainable development of local environments from the perspective of social capital,
- implementation of the cultural theories of development and activity by L. S. Wygotski and J. S. Bruner in educational practices and improvement of the quality of school functioning,
- preparation and functioning of a person in the process of work; social problems of work establishments; relation between work and non-professional life; activity of people in their 'third age',
- audiation and problems of disciplinisation of knowledge in this field in the processes of shaping the identity of the Polish music pedagogy,
- supporting the psychosocial development of children and adolescents, development of parents' educational skills and prevention of risky behaviour of young people in adolescence,
- the identity of pedagogy, educational policy and politicality of education, youth as a subject of scientific research,
- the 20th century philosophy of education in the analytic and continental styles, with particular regard to the achievements and tradition of the Lwów-Warsaw school; exclusion and social support from the pedagogical and philosophical perspectives,
- disruption of functioning of a person, including disorders of speech, hearing, linguistic communication, and their developmental, educational and psychosocial correlations, effects and therapies,
- aetiologic, symptomatologic, prognostic and preventive aspects of social pathologies in the perception and evaluation of youth, as well as risks and socially unacceptable behaviour among youth,
- axiological and methodological problems of contemporary education, with particular regard to academic education in times of intense socio-cultural transformations,
- the subjects of education—the context of social and cultural changes,
- elementary education—current status, requirements, trends, opportunities for development in changing reality,
- local (socio-cultural) correlations of the functioning of selected educational environments,
- training of teachers from the historical and contemporary perspective,
- patriotic and civil attitudes and national security in the united Europe.

The staff of the Institute are involved in numerous research projects financed with grants from NCN, NPRH, MNiSW, NCBR, National Bureau for Drug Prevention. The Institute of Pedagogy cooperates with institutions of regional and national significance, including Educational Research Institute (IBE) and scientific societies, such as the Polish Educational Research Association (PTP).

The Institute of Pedagogy for many years has also cooperated with centres for teacher training in the region with the aim of improving the quality of education. The Bydgoszcz educationalists are also involved in the implementation of the Strategy for Education in the Region and the City of Bydgoszcz for the years 2013–2020.

## Chair of Didactics and Culture of Education Studies

**Scientific and research issues:**

The main areas of research interests of the Chair include:

- studies of implementation of the cultural theories of development and activity by L. S. Wygotski and J. S. Bruner in educational practices and improvement of the quality of school functioning,
- developmental early childhood education—cultural context of the organisation of learning process, especially in children of pre-school and early school age Learning in the school class (models, strategies, developmental tasks), learning and thinking (creative, critical, project-based), motivation and learning,
- studies of the quality and the effects of the organisation of learning process from the beginning of institutionalised education—diagnosis, developmental prospects, children's achievements, their personal capital gained in the successive stages of development, support,

- teacher and pupil in the learning culture–culture of learning, organisational culture of teacher groups, the school environment of learning, language and its relationship with learning, personalised strategies for maintaining discipline, teacher's reflectivity.

The aim of the conducted studies is:

- creation of a conceptual framework for teacher training (particularly those in early education), teachers-professionals, teachers as persons involved in the process of change in education, aware of the change, participating in the change, reflective,
- integration of scientific know-how with a broadly understood educational practice–scientific research aimed at improving educational practices, searching for urgent and real problems, attempting to solve them, conducting research projects demonstrating the usefulness of studies of education,
- improvement of the quality of education in the region and promoting good, innovative educational solutions throughout the country; recommendations for improving educational practice and policy.

A subunit of the Chair of Didactics and Culture of Education Studies is the **Laboratory for Educational Change–Centre for Research on Learning and Development**. It is a unique research establishment meant to allow the participants of educational interactions (teachers and children) to experience potential new ways of working.

Researchers from Europe and rest of the world, as well as educationalists focused on innovations in education invited to cooperate, together with students and teaching practitioners search for and test new ways of working with children.

Laboratory for Educational Change–Centre for Research on Learning and Development is a unit functioning similarly to those already existing in Finland (Helsinki), Russia (Moscow), Lithuania (Vilnius), and acting under the auspices and in cooperation with researchers from the International Society for Cultural-historical Activity Research (ISCAR).

For several years, the research team of the Chair of Didactics and Culture of Education Studies has been conducting studies following this methodology and has been successfully leading projects with the participation of foreign partners, including:

- the Academic Centre for Creativity (ACK) project– a programme by the Ministry of Science and Higher Education,
- the Narrative Environments for Play and Learning (NEPL) project–KA2 Strategic Partnership Project.
- project NOTED/10021 IPTE (2-year) - International Perspectives in Teacher Education,
- project NOTED/10007 (4-year) - Multicultural Practicum Groups and Internationalisation of Teacher Education (MUPIT).

Under the projects ACK and NEPL, pilot activities in the Laboratory for Educational Change have been initiated, which has led to the establishment and implementation of developing teaching sessions, preparation of a package of tasks in development and didactics, as well as implementation of pilot "Learning Studio" sessions with the participation of teachers.

## SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	<p>PROFESSIONAL STUDIES, ANALYSES AND INTERPRETATIONS OF STUDY RESULTS, PREPARING RESEARCH TOOLS, REPORTS AS WELL AS COUNSELLING AND TRAINING ACTIVITIES IN THE SCIENTIFIC FIELDS STUDIED BY THE UNIT, WITH PARTICULAR REGARD TO THE IMPLEMENTATION OF EDUCATIONAL CHANGE FOR:</p> <ul style="list-style-type: none"> <li>• education establishments,</li> <li>• administration (e.g., School Inspectorate, Department of Education of the Voivodeship Marshall's Office, Department of Education of the City Council).</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• design and implementation of scientific studies using the CHAT approach,</li> <li>• conducting research based on the cultural-historical theory by Lew S. Wygotski and followers of this approach, taking into account the cultural context of learning and development,</li> <li>• testing the "theory-method" by Lew S. Wygotski, double stimulation methods, teaching experiment, procedures that allow revealing the developmental potential of an individual,</li> <li>• developing/establishing a system of developmental-didactic tasks,</li> <li>• designing, implementation and analysis of sessions of developing teaching,</li> <li>• formative interventions,</li> <li>• analysis of the processes of expansive learning in experimental situations created in the Laboratory; sessions in Learning Studio,</li> <li>• testing and introducing of innovative developmental models,</li> </ul>

<b>Research services</b>	<ul style="list-style-type: none"> <li>• developing sets of interventional instruments,</li> <li>• registering critical events, difficulties and problems–documentary analysis,</li> <li>• creating a triad study group and a network of social learning (work in interdisciplinary teams, work in teams with different “advancement” of knowledge of the problem).</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• guiding training involving the participation of educators (e.g., Summer School of Change),</li> <li>• dissemination of established solutions using a programme of specialised training, workshops, conferences, publications and consultations with external beneficiaries, as well as using a specialised modern internet-based platform,</li> <li>• conducting an open “School for parents and teachers” with a broad offer of lectures and workshops allowing a better preparation for “being a sufficiently good tutor for an individual” throughout life, improvement of skills in the support of development and education in innovative entrepreneurship,</li> <li>• improving the range of lifelong education in the region through the implementation of training courses, workshops, specialisation courses, post-graduate studies for teachers and entrepreneurs adequate for the labour market. Other teaching-counselling activities for adults, with particular regard to the development of soft skills (also for business purposes), methodical and substantive development for teachers and other people interested in the organisational culture of companies.</li> </ul>

## Organisational culture of teaching teams and head teachers

### Description of offer:

Specific activities:

1. Development of tool 1–Organisational culture of teaching teams.
2. Development of tool 2–Organisational culture of head teachers.
3. Report.
4. Conference on school culture. Problems–Dilemmas–Solutions.
5. Development of the report.

**Potential uses:** Presentation of results of studies regarding the two subcultures in the organisational culture of the school–teaching teams and head teachers from the kujawsko-pomorskie voivodeship, and demonstration of the role played by organisational culture in the situation of permanent change in education.

### Keywords:

- education
- organisational culture

### Action:

- ☒ research service
- ☒ training and consulting offer

## Training for teachers and head teachers

**Description of offer:** Preparation of a range of tailored training programmes resulting from the changing “CONTEXT”, challenges of the contemporary world, institutional requirements, disclosed needs of teachers and head teachers.

### Keywords:

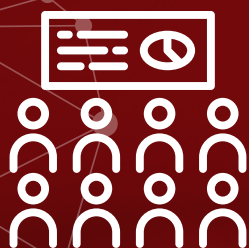
- education

### Action:

- ☒ research service
- ☒ training and consulting offer







# **INSTITUTE OF PSYCHOLOGY**

[www.psychologia.ukw.edu.pl](http://www.psychologia.ukw.edu.pl)





## The Authorities

Prof. Janusz Trempała, Ph. D., D. Sc.

## Contact Information



ul. Staffa 1,  
85-867 Bydgoszcz



52 37 08 403



psyche@ukw.edu.pl



www.psychologia.ukw.edu.pl

## Structure

- Academic Centre for Psychological Guidance
- Department of Clinical Psychology
- Chair of Human Development
- Department of Methodology in Social Sciences
- Department of General and Health Psychology
- Department of Organisational and Management Psychology
- Department of Social Psychology and Research on Adolescents
- Department of Psychopathology and Clinical Diagnosis

**Scientific and research issues:**

The most important topics of research conducted at the Institute of Psychology are:

- theories of personality and its measurement, theories of human mental development, cognitive and moral development, individual differences,
- psychopathology of child development and support of development,
- mental chronometry, perception of order of stimuli, mechanism of regulation and control of reaction to perceived stimuli,
- stereotypes and social prejudices, sense of satisfaction in life,
- functioning and rehabilitation of the mentally and physically disabled, methods of coping with cancer disease, psychological problems of organ transplantology.

In recent years, new directions of studies have emerged, related to:

- the effectiveness of cognitive interventions in human functioning and development,
- neural correlates of the effects of cognitive training,
- genetic correlations of chronotypes in cognitive functioning,
- diagnosis of cerebral damage, its rehabilitation and communication in reduced awareness states,
- cross-cultural differences in the shaping social ties and emotions,
- communication standards in the physician-patient interactions,
- nutrition in the development of children and adolescents,
- increasing the physical capacity of athletes,
- psychological counselling in artistic education.

## **Department of Human Development + Department of General and Health Psychology + Laboratory of Neuropsychology: research Team**

**Scientific and research issues:**

Department of General and Health Psychology conducts research in the following fields:

- psychology of health,
- clinical psychology,
- psychology of individual differences,
- psycho-oncology,
- psychology of addiction,
- gerontopsychology,
- neuropsychology,
- chronopsychology,
- molecular genetic aspects of cognitive functions in healthy people,
- cognitive functions in alcohol-dependent people,
- neuropsychological rehabilitation–new methods in computer-based training of cognitive functions.

Conducts studies of human development throughout life in the following fields:

- cognitive development,
- moral development,
- social and emotional development,
- psychosexual development,
- methodology of measuring developmental changes,
- support of development.

The Department staff conducts studies of, e.g., the effectiveness cognitive function training in different age groups, including:

- children,
- people in their young adulthood,
- people in their old age.

These studies have led to the creation of proprietary computer applications for the diagnosis and training of cognitive functions (including: operational memory, attention, executive functions, reasoning) in different age groups. Part of these studies employed EEG measurements.

The Department of Human Development conducts statutory studies of the impact of life events on the changes in human functioning.

<b>SCIENTIFIC RESEARCH PROSPECTS</b>	
<b>Business cooperation offer</b>	SCIENTIFIC RESEARCH FOR: <ul style="list-style-type: none"> <li>• schools,</li> <li>• healthcare and welfare units,</li> <li>• care institutions for the elderly, including people with dementia,</li> <li>• a wide variety of business customers.</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• design of cognitive function training tools,</li> <li>• development of scenarios for cognitive training tasks,</li> <li>• development of research plans regarding verification of the effectiveness of cognitive function training,</li> <li>• statistical analysis of data from studies of the effectiveness of cognitive function training,</li> <li>• neuropsychological assessment in all age groups,</li> <li>• development of scenarios for games in the psychology of health and rehabilitation.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• leading cognitive function training sessions,</li> <li>• design of tasks dedicated to individual cognitive functions,</li> <li>• care for people with cognitive dysfunctions.</li> </ul>

## Assessment and training of cognitive functions in sickness and in health: training

### Description of offer:

1. development of plan for the assessment and training of cognitive functions, scenarios for training sessions and individual tasks, both traditional and computerised,
2. training of people involved in the implementation of training by leading training sessions and gathering training data, current consultations,
3. development of the collected data and evaluation of the effectiveness of training.

**Potential uses:** The offer is aimed at institutions involved in the assessment, support and training of cognitive functions.

### Keywords:

- psychological test
- cognitive training
- neuropsychological assessment

### Action:

- ☒ training and consulting offer

## Development of scenarios for computer games for use in the psychology of health and rehabilitation

**Description of offer:** Development of scenarios for computer games for use in the psychology of health and rehabilitation may be useful in the cognitive training of elderly people and improvement of the mental functioning and quality of life of patients and healthy people. Scenarios adapted to the customer's needs.

**Potential uses:** The offer is aimed at institutions dealing with health and rehabilitation.

**Keywords:**

- computer games
- psychology of health
- rehabilitation
- gamification

**Action:**

- ☒ training and consulting offer

## Department of General and Health Psychology- Laboratory of Psychological Tests

### Scientific and research issues:

Laboratory of Psychological Tests provides the most recent tests useful in psychology. The Laboratory uses psychological tests that have been officially published in Poland.

Types of tests:

- tests for measuring intelligence (including WISC-R, WAIS-R, Raven's Matrices Test),
- tests useful in the psychology of health and labour,
- neuropsychological tests (e.g., Benton, DUM, Bender),
- tests designed to measure personality and temperament (EPQ-R, NEO-FFI, NEO-PI-R).

and

- projective tests (e.g., Rorschach test).

The Laboratory conducts proprietary studies of the development of tests. To date, actions have been taken to develop a Sense of Hope Questionnaire and Sense of Humour Questionnaire, Social Approval and Personality Inventory Questionnaire HEXACO-PI-R. In the future, proprietary tests useful in measuring talents and health psychology will be developed. The operating rules and the Laboratory rules are in accordance with the Code of Ethics of the Polish Psychological Association.

### SCIENTIFIC RESEARCH PROSPECTS

#### Business cooperation offer

SCIENTIFIC RESEARCH INVOLVING THE USE OF PSYCHOLOGICAL TESTS FOR:

- schools,
- healthcare units,
- a wide variety of business customers.

#### Research services

- adaptation, standardisation and creation of new psychological tests.

#### Training and consulting services

- use of psychological tests (mainly of categories A and B).

## Use of psychological tests in the promotion and psychology of health: training

**Description of offer:** Training in the use of psychological tests in the promotion and psychology of health.

Training in psychological tests of category A is dedicated to people with no degree in psychology (no entitlement to use category C tests), especially physicians, sociologists, educators, people involved in health promotion and psychotherapists.

**Potential uses:** Groups of employees of all sectors of the economy.

**Keywords:**

- psychological test
- category A
- tests for psychologists
- promotion and psychology of health

**Action:**

- ☒ training and consulting offer

## Department of Organisational and Management Psychology

### Scientific and research issues:

The Department of Organisational and Management Psychology conducts studies of the functioning of an employee on the labour market, and particularly:

- shaping work—changes in behaviour at work that are meant to increase effectiveness and job satisfaction
- psychological factors associated with employee's health and protecting employee from stress and burnout.

### SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	STUDIES AND TRAINING AND COUNSELLING FOR: <ul style="list-style-type: none"> <li>• counselling and training organisations,</li> <li>• business entities (services and production).</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• diagnostic programmes,</li> <li>• psychological support programmes for employees and managers.</li> </ul>
<b>Training and consulting services</b>	TRAINING SERVICES IN: <ul style="list-style-type: none"> <li>• shaping work,</li> <li>• motivating to work,</li> <li>• formal and informal communication,</li> <li>• coping with stress at work.</li> </ul>

## Creative employee

**Description of offer:** Teaching–training workshops for employees and/or managers, aimed to:

- induce the need for improving own work,
- carry out work more efficiently,
- increase employee satisfaction and gain benefits for the organisation.

At workshops, the staff will learn about the possible methods to improve and change work, and will implement these activities in their company. At the end of the training, a verification process of close and distant effects is conducted, along with feedback and motivating reminder sessions. The duration of workshops, reminder sessions and monitoring of the effects is approximately 1 year.

**Potential uses:** Groups of employees of all sectors of the economy.

**Keywords:**

- shaping work
- creativity at work
- autonomy at work

**Action:**

- ☒ training and consulting offer





# FACULTY OF PHYSICAL EDUCATION, HEALTH AND TOURISM

[www.wydzialkulturyfizycznej.ukw.edu.pl](http://www.wydzialkulturyfizycznej.ukw.edu.pl)



## The Authorities

### Dean

Prof. Zygmunt Babiński, Ph. D., D. Sc.

### Associate Dean for Scientific Research

Michał Habel, Ph. D.

### Associate Dean for Teaching

Mirosława Szark-Eckardt, Ph. D.

## Contact Information



ul. Ogińskiego 16,  
85-092 Bydgoszcz



52 32 36 753



magdao@ukw.edu.pl



[www.wydzialkulturyfizycznej.ukw.edu.pl](http://www.wydzialkulturyfizycznej.ukw.edu.pl)

## Faculty Structure

- Institute of Geography
- Institute of Physical Culture

## Brief Description of the Faculty

**The scientific and educational activity of the Faculty of Physical Culture, Health and Tourism is connected with the needs of contemporary tourism, water and pro-health economy.**



The Faculty educates students in five areas: geography, revitalisation of waterways, tourism and recreation, physical education and crisis management in the environment.

The Faculty's research and teaching activities cover a wide range of natural sciences, health sciences and technical sciences, as well as issues related to logistics and economics.

The interdisciplinary concept is reflected in the unique course of study i.e. revitalisation of waterways which educates specialists in the field of waterway management in the context of their operation, reconstruction, renewal and planning of cargo transport. The knowledge and skills of graduates in the area of natural and technical sciences, as well as in the fields of naviga-

tion, transport and logistics, water protection, landscape architecture and economics, make them desirable employees on the labour market.

The courses of study and research conducted at the Faculty are in line with the strategic objectives of the voivodeship's development, contemporary market trends and the concept of sustainable development at the environmental, social and economic levels.

The leading research topics of the Institute of Geography are: climate change, landscape changes, water management in the Vistula river valley and its tributaries, including the process of making rivers navigable and the study of tourism.

In the area of physical geography, issues are addressed such as the impact of human activities



on the natural environment, local and regional variations in climatic conditions, the climate of invested areas, including urban climate, research in the field of morphology, morphogenesis and landscape protection, physiographic and ecophysiographic studies.

As far as geography of tourism is concerned, research is conducted on spatial types and structure of tourist values, tourist traffic, multisensory perception of landscapes, tourism in areas of high natural value and methods of GIS research.

The Institute of Physical Culture conducts research in the following areas: multi-directional conditions of the long-term sports training process, optimisation of training loads and methods of their diagnosis depending on the specificity of the sport and health diagnosis (including problems with weight and posture, chronic

diseases, other diseases, dysfunctions and disorders) and physical fitness focused on the health of children and youth in the region, as well as diagnosis of their lifestyle, with particular emphasis on physical activity. The scientific staff of the Faculty consists of 6 full professors, 14 employees with a post-doctoral degree, 29 employees with a PhD degree and 10 masters.

One of the current strategic objectives of the Faculty is to broaden cooperation with the environment in the Kujawsko-Pomorskie Voivodeship, which is implemented through establishing and strengthening cooperation with regional and national institutions in the area of knowledge implementation, research results in the area of physical and socio-economic geography, promotion of health education and physical culture as well as tourism and sustainable development.





# INSTITUTE OF GEOGRAPHY

[www.geografia.ukw.edu.pl](http://www.geografia.ukw.edu.pl)





## The Authorities

Zbigniew Podgórski, Ph. D., D. Sc., Associate Professor

## Contact Information



Plac Kościeleckich 8,  
85-033 Bydgoszcz



52 34 96 250



[geografia@ukw.edu.pl](mailto:geografia@ukw.edu.pl)



[www.geografia.ukw.edu.pl](http://www.geografia.ukw.edu.pl)

## Structure

- Chair of Revitalisation of Waterways
- Department of Landscape History Research
- Department of Physical Geography and Landscape Design
- Department of Social and Economic Geography
- Department of Tourism Geography

### Scientific and research issues:

The Institute of Geography has developed in its activity a characteristic profile of research areas. Since the beginning of the operation of the unit, the main research topics have been problems related to the landscape perception and contemporary riverbed processes, taking into account the influence of the water level in Włocławek on the process of deep erosion below the dam. These topics have been the subject of numerous scientific studies, including books. Along with the Institute's human resources development, the research horizon was broadening, focusing on the interests of employees, in particular in the fields of physical geography, tourism, sustainable development and socio-economic geography.



In the area of physical geography, the dominating topics are those related to the water management in the Vistula valley and its tributaries, local and regional climatic diversity, the climates of the invested areas, including urban climate and research in the field of morphology, morphogenesis and landscape protection. In the area of tourism geography, research is conducted on spatial types and structures of tourism values, tourism traffic and management at the level of tourist destinations or administrative units, multisensory perception of landscapes, tourism in areas of high natural and rural value, methods of research using the GIS system. Employees dealing with the issues of sustainable development investigate the natural and economic foundations of sustainable development (e.g. the region of Tuchola Forest) and its regional problems as exemplified by selected cities and forms of use of natural resources. Moreover, the Institute deals with a complex subject of international importance: changes in the natural environment of Central and Western Mongolia, with particular emphasis on permafrost processes. The Institute of Geography cooperates with many economic operators and public entities, including: The complex of Chełmiński and Nadwiślański Landscape Parks, Tuchola Landscape Park, Krajeński Landscape Park, Municipal Office in Mrocza, Statistical Office in Bydgoszcz, Institute of Meteorology and Water Management in Bydgoszcz and Regional Board of Water Management in Gdańsk.

Research and teaching activities are supported by vessels belonging to the Kazimierz Wielki University in Bydgoszcz: river ship m/s KAZIMIERZ, motor boat and pontoons.

## Chair of Revitalisation of Waterways

### Scientific and research issues:

The research is carried out by a wide range of specialists from the fields of science related to the water environment, water management and inland navigation, in particular:

- hydrology,
- geomorphology,
- water ecology,
- spatial planning and cartography,
- GIS spatial information systems,
- inland waterway shipping.

Employees of the Chair actively participate in undertakings (seminars, conferences, as members of advisory bodies) concerning key problems of economic use of Polish rivers and their activation.

### SCIENTIFIC RESEARCH PROSPECTS

#### Business cooperation offer

RESEARCH AND TRAINING SERVICES FOR COMPANIES AND INSTITUTIONS OPERATING IN THE AREA OF:

- water management,
- inland waterway shipping.

#### Research services

COMPREHENSIVE FIELD STUDIES

- bathymetric measurements of water reservoirs with geodesic offset and GPS RTK positioning,
- hydrological measurements, including flow rates and velocities of water in rivers using ultrasonic and classical methods,
- sampling of water and bottom sediments,

<b>Research services</b>	<ul style="list-style-type: none"> <li>• measurements of basic physical and chemical parameters of water and bottom sediments;</li> </ul> <p>LABORATORY TESTING:</p> <ul style="list-style-type: none"> <li>• analyses of the basic physicochemical indicators of water,</li> <li>• sedimentological analyses (e.g. granulometric and organic matter fraction analyses);</li> </ul> <p>INDOOR ANALYSES, STUDIES, SPECIALIST CONSULTATIONS:</p> <ul style="list-style-type: none"> <li>• hydrological surveys needed for permits for special use of water,</li> <li>• reports on the impact of the investment on the environment,</li> <li>• programmes for protected areas,</li> <li>• flood risk assessments,</li> <li>• revitalisation projects for waterways and degraded areas,</li> <li>• maps, plans, databases in GIS systems,</li> <li>• creating digital models of the aquatic environment,</li> <li>• inventories of the abiotic environment (geology, geomorphology, hydrography, hydrology, pedology, tourist resources),</li> <li>• consulting and advising on the exploitation of natural resources.</li> </ul>
<b>Training and consulting services</b>	<p>IMPLEMENTATION OF THE RIVER INFORMATION SERVICES (RIS) DIRECTIVE,</p> <ul style="list-style-type: none"> <li>• individual rescue techniques,</li> <li>• operation of radio equipment in inland navigation, including operation of VHS radiotelephone,</li> <li>• vessel driving instruction - manoeuvring.</li> </ul>

**The Centre for Revitalisation of Waterways** is a university-wide unit of the Kazimierz Wielki University whose research facilities are largely staffed by employees of the Department of Revitalisation of Waterways.

The Centre's tasks shall include in particular:

1. conducting consulting, information and training activities in the field of revitalisation of waterways and application in that respect of technologies and innovative solutions developed in appropriate basic organizational units of the University,
2. cooperation with external entities and provision of services for them in the scope of finding solutions related to the revitalisation of waterways for the social and economic environment,
3. cooperation with basic organisational units of the University in the scope of development and implementation of national and international research programmes and support in obtaining funding,
4. supporting the University staff in commercialisation of their scientific achievements in the field of revitalisation of waterways.

## Evaluation of navigation conditions and socio-economic conditions on the Polish section of the International Waterway E70 - an example of implementation

**Description of offer:** Inland waterway transport is an important sector of EU economic activity. It is characterised by features which, in the conditions of well-developed waterways, allow it to compete with inland modes of transport in terms of operating costs.

In Poland, inland waterway transport is still of minor importance. The low share of inland waterway transport in the transport market is mainly due to poor technical condition of waterways and insufficient reservoir retention. The research services offered consist in analyses of the condition of the waterway taking into account factors which may stimulate or limit its role in the transport system, including:

1. Natural conditions – are a major constraint on the ability to flexibly adapt the waterway to changing transport needs. The density of waterways is much lower than in other modes of transport, and the possibilities of development of inland navigation are determined primarily by their quality and spatial layout.
2. Economic and ecological advantages – this transport is the cheapest and least emissive form of transport. However, it should be borne in mind that a significant feature of the profitability of the service is the transport capacity of the waterway. The higher the parameters of the waterway, the greater the transport capacity and thus the economic benefits.

**Potential uses:** Poland's adoption of the European Agreement on Main Inland Waterways of International Importance (AGN Convention) is the first step towards launching investment and construction processes to improve navigability on Polish rivers and related technical infrastructure.

**Keywords:**

- inland waterway shipping

**Action:**

- ☒ research service

## Department of Social and Economic Geography

### Scientific and research issues:

The Department of Social and Economic Geography conducts research in the field of socio-economic geography, regional development, spatial planning, cartography, and in particular:

- geography of population and settlement,
- geography of agriculture,
- socio-economic changes in rural areas, cities, administrative units,
- tourism and spatial planning,
- geography of services.

### SCIENTIFIC RESEARCH PROSPECTS

#### Business cooperation offer

ANALYTICAL SERVICES, EXPERTISE AND TECHNOLOGICAL CONSULTING FOR REPRESENTATIVES OF THE FOLLOWING INDUSTRIES:

- local government administration,
- central administration,
- organisational units at the local government level,
- organisational units at the central government level,
- economic stakeholders.

#### Research services

COMPREHENSIVE GEOGRAPHICAL STUDIES:

- assessment of the impact of the geographical environment on the development of the economy and its industries in the Kujawsko-Pomorskie Voivodeship at the local and regional level,
- vaporisation of natural and cultural space for the needs of tourism and recreation at the local and regional level,
- population surveys in the Kujawsko-Pomorskie Voivodeship, including population growth, population structure, migration trends, etc. at the local and regional level,
- analysis of the labour market in the Kujawsko-Pomorskie Voivodeship,
- research on housing preferences of residents of Bydgoszcz and its suburban area,
- research on transformations of spatial and social structures of cities in the Kujawsko-Pomorskie Voivodeship,
- research on rural development in the Kujawsko-Pomorskie Voivodeship,
- studies on changes in land use in Kujawsko-Pomorskie Voivodeship at local and regional level,
- research on the economy of the Kujawsko-Pomorskie Voivodeship,
- research on the market and tourist traffic in the Kujawsko-Pomorskie Voivodeship at the local and regional level,
- geographical and economic regionalisation and functional and spatial typology in the Kujawsko-Pomorskie Voivodeship (communes);

PREPARATION OF STRATEGIES AND OTHER DOCUMENTS IN COOPERATION WITH OTHER ORGANISATIONAL UNITS OF THE INSTITUTE OF GEOGRAPHY OR OTHER ORGANISATIONS IN THE AFOREMENTIONED AREAS.

<b>Training and consulting services</b>	<b>TRAINING SERVICES:</b> <ul style="list-style-type: none"> <li>• national spatial reference system according to the requirements of the Regulation of the Council of Ministers of 15 October 2012,</li> <li>• system of coordinates of contemporary Polish topographic maps,</li> <li>• measurements on the map,</li> <li>• field orientation without maps and according to the map,</li> <li>• preparation and realisation of a route march according to the azimuth,</li> <li>• Global Positioning Systems (GPS, GLONASS, GALILEO),</li> <li>• situational-height measurements,</li> <li>• modern remote sensing techniques and systems,</li> <li>• interpretation of aerial and satellite images.</li> </ul>
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## Department of Landscape History Research

### Scientific and research issues:

The Department of Landscape History Research conducts research on the reconstruction of the deposition mechanisms of the Polish Lowlands sediments in Pleistocene and Holocene. The works concern glacial, fluvioglacial and lime deposits, river and aeolic deposits as well as deposits accumulated in beaver and mill ponds. The research uses geological methods: field and laboratory, taking into account GIS techniques (preparing maps and digital models of the studied areas).

<b>SCIENTIFIC RESEARCH PROSPECTS</b>	
<b>Business cooperation offer</b>	<b>ANALYTICAL SERVICES, EXPERTISE AND TECHNOLOGICAL CONSULTING FOR REPRESENTATIVES OF THE FOLLOWING SECTORS:</b> <ul style="list-style-type: none"> <li>• local government administration,</li> <li>• organisational units at the local government level,</li> <li>• non-governmental organisations,</li> <li>• economic stakeholders.</li> </ul>
<b>Research services</b>	<b>COMPREHENSIVE FIELD STUDIES:</b> <ul style="list-style-type: none"> <li>• hydrological measurements, including: flow rates and velocities of water in rivers using ultrasonic and classical methods,</li> <li>• geological drilling with a manual auger and excavations,</li> <li>• sampling of mineral and organic sediments,</li> <li>• analysis of the geological structure in expositions and excavations;</li> </ul> <b>LABORATORY TESTING:</b> <ul style="list-style-type: none"> <li>• sedimentological analyses (granulometry, content of organic sediments);</li> </ul>
<b>Research services</b>	<b>INDOOR ANALYSES AND STUDIES IN THE FIELD OF:</b> <ul style="list-style-type: none"> <li>• maps, plans, databases in GIS systems,</li> <li>• creation of digital sculpture models,</li> <li>• inventory and analysis of geological and geomorphological resources for various types of projects taking into account such conditions,</li> <li>• consulting and advising on the exploitation of natural resources.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• training in the recognition and valorisation of the Earth's abiotic heritage.</li> </ul>



# Department of Physical Geography and Landscape Design

## Scientific and research issues:

In the Department, research is conducted by experts in physical geography, specializing in hydrology, including:

- water management,
- the impact of human activities on the state of the aquatic environment,
- water ecology,
- hydrochemistry.

A separate research subject is Geographic Information System, including the use of GIS techniques in spatial planning and cartography as well as network analyses. The staff of the Institute of Geography has been conducting research in the field of hydrology for 20 years, in the field of using GIS for scientific purposes and commercial implementations for 10 years, and in the field of hydrochemistry for 4 years (cooperation with the leading chemical department in Poland). The research is conducted both in Poland and abroad (including regions with difficult access, such as Mongolia, Russia, Antarctica, Spitsbergen). Employees with certificates of completion of international and national courses and training in the use of GIS software, as well as experience in managing hydrological and GIS business projects. They also provide ongoing research services in the field of hydrological research and GIS for small, medium and large enterprises.

## SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	<p>ANALYTICAL SERVICES, EXPERT OPINIONS AND TECHNOLOGICAL CONSULTING FOR THE FOLLOWING SECTORS:</p> <ul style="list-style-type: none"> <li>• telecommunications (services relating to the design of GIS solutions),</li> <li>• environmental protection,</li> <li>• hydrology,</li> <li>• water management,</li> <li>• other users of the Geographic Information System (GIS).</li> </ul>
<b>Research services</b>	<p>COMPREHENSIVE FIELD STUDIES:</p> <ul style="list-style-type: none"> <li>• hydrological measurements, including water levels in rivers and standing waters, flow rates and velocities in rivers using ultrasonic and conventional methods,</li> <li>• water sampling,</li> <li>• measurements of basic physical and chemical parameters of water,</li> <li>• field inventory of the impact of human activities on water relations,</li> <li>• inventory of water environment resources in protected areas.</li> </ul>
<b>Research services</b>	<p>PRACTICAL STUDIES AND INDOOR ANALYSES:</p> <ul style="list-style-type: none"> <li>• determination of the nature of the waters (standing waters and flowing waters),</li> <li>• surveys on the impact of the works carried out on the plot (on water relations on neighbouring land),</li> <li>• hydrological calculations,</li> <li>• hydrological surveys for protected areas,</li> <li>• design of hydrological measurement networks in protected areas,</li> <li>• analysis and assessments of the impact of the project on the landscape (landscape analyses),</li> <li>• GIS, satellite remote sensing and low altitude image (UAV) studies,</li> <li>• network analyses,</li> <li>• design and creation of GIS databases.</li> </ul>

## Training and consulting services

### TRAINING IN THE FIELD OF:

- GIS, Spatial Information Systems, Open Source applications and capabilities in GIS,
- applications of GIS in territorial self-government units, preparation and processing of spatial data for the needs of the Infrastructure for Spatial Information,
- hydrological monitoring.

## Opinion on whether Lake X is flowing water or not

**Description of offer:** Hydrological expertise to determine whether the lake in question should be classified as flowing or standing water. A lake classified as standing water may not be related directly with surface running waters in a natural way.

**Potential uses:** The lake classification is of fundamental importance for civil law transactions in the real estate market. Land covered by flowing waters is subject to restrictions on the possibility of acquiring private property rights.

### Keywords:

- bathymetry
- inland waterway shipping

### Action:

- ☒ research service





# INSTITUTE OF PHYSICAL CULTURE

[www.kulturafizyczna.ukw.edu.pl](http://www.kulturafizyczna.ukw.edu.pl)



## The Authorities

Mariusz Zasada, Ph. D., D. Sc., Associate Professor

## Contact Information



ul. Sportowa 2,  
85-091 Bydgoszcz



52 32 31 743



ikf@ukw.edu.pl



[www.kulturafizyczna.ukw.edu.pl](http://www.kulturafizyczna.ukw.edu.pl)

## Structure

- Department of Anatomy and Biomechanics
- Department of Biomedical Basis of Physical Culture
- Department of Individual Sports
- Department of Team Sports
- Department of Theory and Methodology of Physical Education and Sport
- Physical Activity Laboratory
- Prevention and Nutritional Education Laboratory



**Scientific and research issues:**

The research of the academic staff of the Institute of Physical Culture is conducted in the areas of medical sciences and physical culture. The main research issues raised in the employees' publications are as follows:

**DETERMINANTS OF ACHIEVEMENT IN CONTEMPORARY SPORT:**

- the impact of supplementation with substances of plant origin on the physical capacity of young men,
- personal predispositions in combat sports in the context of neuropsychological, neurobiological and genetic research,
- optimisation of sports training in cyclical disciplines at particular stages of an athlete's training,
- multi-directional determinants of the long-term process of sports training in coordinately complex disciplines;

**PHYSICAL ACTIVITY FOR HEALTH IN DIFFERENT AGE GROUPS AND PROMOTION OF HEALTHY BEHAVIOUR:**

- balance and posture control disturbances in athletes and non-trained persons – consequences of sports training and lifestyle,
- evaluation of dietary habits of selected persons belonging to specific social groups divided into age, sex, health condition and physical activity,
- evaluation of somatic structure, fitness, involvement in physical activity of children and youth from the Kujawsko-Pomorskie Voivodeship,
- evaluation of the relationship between pharmacotherapy, physical activity and other lifestyle elements with students' somatic structure and health,
- lifestyle, physical development of children, youth and adults of the Kujawsko-Pomorskie Voivodeship;

**ASPECTS OF PHYSICAL ACTIVITY OF HEALTHY PERSONS AND DISABLED ONES AND THE LEVEL OF THEIR PHYSICAL FITNESS:**

- kinanthropometric characteristics of disabled and chronically ill persons,
- muscle tension disorders in the pathogenesis of postural abnormalities in children and adolescents,
- attempt to determine the effects and impact of the weight load of transported school supplies on the pupil's body posture;

**PREVENTION AND EDUCATION OF HEALTHY NUTRITION.**

The Institute of Physical Culture uses the university educational and sports base of the newly built complex at Sportowa Street.



## Department of Anatomy and Biomechanics

**Scientific and research issues:**

Employees of the Department of Anatomy and Biomechanics perform diagnostic tests, such as:

- measurements of moments of muscle forces under static and dynamic conditions,
- measurements of the mechanical force of the lower limbs muscles developed during jumps on a dynamometer platform,
- measurements of the mechanical force of the lower limb muscles developed in cycloergometer tests,
- determination of force-speed and power-speed characteristics,
- evaluation of muscle bioelectrical activity by surface electromyography,
- evaluation of the change in the level of selected biochemical exponents related to the stress response of the athlete's organism under the influence of long-term training on the basis of the concentration of the following markers:
  - » CTX, PINP – bone rotation markers,
  - » Ceruloplasmin, FRAP,
  - » Milky marker, haptoglobin, haemoglobin, free haemoglobin, ferritin, LDH, CK,
  - » IL-6, TNF-alpha, IL-1, CRP protein, ox-LDL, α-amylase, DHEA, CRH, cortisol, adrenaline, noradrenaline,
- determination of genetic predisposition to sports achievements (SNP) and changes in the level of expression in genes related to inflammatory response, growth and metabolism of muscle fibres in highly qualified athletes on the basis of:
  - » analysis of mutations in among others, ACE, ACTN3, EPOR, HIF1A genes,



- » analysis of the level of gene expression associated with the inflammatory response (CCL5, CCR2, CCR3, CCR4, NOS-3, TNF),
- » analysis of the relationship between the adaptation expressed level of expression and the influence of many years of physical training with specific features (anaerobic, mixed) on their development,
- » analysis of the level of gene expression related to oxidative stress, increase of muscle fibres and their energy under the influence of many years of sports training in highly qualified athletes,
- assessment of personal predisposition in combat sports in the context of neuropsychological, neurobiological and genetic research,
- identification of health risk factors and assessment of the health status of different groups of the population, with a particular focus on people with physical disabilities,
- searching for the relationship between the state of health of different groups of the population and demographic, socio-economic and behavioural factors.

### SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	SERVICES FOR REPRESENTATIVES OF INDUSTRIES OPERATING IN THE AREA: <ul style="list-style-type: none"> <li>• health,</li> <li>• rehabilitation,</li> <li>• physiotherapy,</li> <li>• tourism and recreation.</li> </ul>
<b>Research services</b>	DIAGNOSTICS OF PHYSICAL CHARACTERISTICS: <ul style="list-style-type: none"> <li>• the power and height of the leap in jumping ability tests carried out on the dynamometer platform,</li> <li>• moments of knee joint forces under isometric and isokinetic conditions on the Biodex 4PRO.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• individual rescue techniques (IRT), i.e. pre-medical first aid.</li> </ul>

## Physical Activity Laboratory

### Scientific and research issues:

The aim of the Physical Activity Laboratory is to conduct research as part of research projects carried out by the employees of the Institute of Physical Culture. The Laboratory is also used by sportsmen – students of physical education during classes and research related to the written diploma theses.

The Laboratory's equipment allows to conduct research in the field of anthropometry, body composition analysis, muscle force of various muscle groups, power of lower limbs, hand force, locomotive speed, running endurance, cardiorespiratory fitness, spirometry and EMG testing – neuromuscular activity during posture examinations, functional movements, work, as well as treatment or training.

### SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	SERVICES FOR REPRESENTATIVES OF INDUSTRIES OPERATING IN THE AREA: <ul style="list-style-type: none"> <li>• health,</li> </ul> and <ul style="list-style-type: none"> <li>• rehabilitation, physiotherapy and sanatorium centres,</li> <li>• sports schools.</li> </ul>
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<b>Research services</b>	<p>THE APPLICATION OF PROBLEMATIC ASPECTS OF RESEARCH IN PRACTICE INCLUDES:</p> <ul style="list-style-type: none"> <li>comprehensive laboratory tests in the field of anthropometry and morphology of the body, force, cardiorespiratory fitness,</li> <li>comprehensive tests in the centres ordering the tests: anthropometric, body composition and structure, locomotion speed, muscle force, cardiorespiratory fitness,</li> <li>analysis on the basis of own research and scientific literature in the field of sports potential of athletes, physically active and inactive persons.</li> </ul>
<b>Training and consulting services</b>	<p>TRAINING SERVICES AND CONSULTANCY IN THE AREA OF:</p> <ul style="list-style-type: none"> <li>measurements and analyses related to the structure and composition of the body,</li> <li>muscle force,</li> <li>cardiorespiratory fitness.</li> </ul>

## Anthropometric measurements

**Description of offer:** Test method for body measurements with the Duometer Plus OP-1/DA anthropometric measurement kit. The duometer is designed for postural quality measurements and anthropometric and biomechanical measurements of:

- body height,
- the position of selected bone points,
- width and length,
- symmetry of the body (shoulders, shoulder blades, length of limbs),
- valgus and varus deformities of lower limbs,
- shoulder girdle mobility,
- mobility of blades,
- the position of selected bony points of the hip rim,
- head position,
- spinal mobility.

**Potential uses:** Anthropometric measurements are used in many fields of science, e.g. anthropology, medicine (growth disorders, obesity), sports, as well as ergonomics of common objects and clothing production (furniture, equipment, footwear, etc.). It is often not the values of measurements that are of fundamental importance, but the relationships between them and the proportions of the human body.

**Keywords:**

- anthropometry
- body measurements

**Action:**

- ☒ research service
- ☒ training and consulting offer

## Muscle evaluation and dynamic training

**Description of offer:** An isokinetic dynamometer allows the force of the muscles in individual joints to be assessed. The Biodex System 4 Pro kit for the evaluation and dynamic training of muscles on which measurements are made allows to take into account the following conditions:

- passive movement,
- isometric work,
- isotonic (concentric and eccentric) work,
- isokinetic (concentric and eccentric) work,
- reactive eccentric work.

The examination may involve muscles of:

- the knee joint,
- the ankle joint,
- the hip joint,
- the shoulder joint,
- the elbow joint,
- the wrist.

**Potential uses:** Dynamic muscle evaluation and training enable an objective assessment of the condition of the patient/athlete before, during and after the treatment/workout, including the tracking and verification of the rehabilitation progress or the risk of injury (muscle tears, strains).

**Keywords:**

- dynamometer
- dynamic muscle training
- muscles and joints

**Action:**

- ☒ research service
- ☒ training and consulting offer

## Exercise testing of the respiratory and circulatory systems

**Description of offer:** Compact exercise test for precise determination of cardiopulmonary parameters. Measurements are made with the Quark CPET/K4B2 stationary and portable system for respiratory and cardiac system exercise testing + Quark CPET peripherals: ECG measurement via 12-channel ECG, pulse oximetry, spirometry.

Basic features of the Quark CPET system:

- registration of respiratory parameters „breath-by-breath”,
- determination of anaerobic threshold,
- measurement of oxygen absorption,
- measurement of CO<sub>2</sub> expel,
- measurement of tidal volume,
- measurement of respiratory flow (ventilation).
- heart rate measurement,
- ergometer and track control.

**Potential uses:** The test allows you to register the heart and respiratory functions during each breath. The system can be used for tests of all groups, from children to adults, from people with disabilities to professional athletes. In addition, it is an essential tool for assessing the level of physical fitness of athletes. This assessment should be carried out at all stages of training/exercising. The ability to perform performance tests and thus determine the level of readiness for physical effort on the basis of strictly classified load values is an indispensable component of optimisation of the process of influencing the human body through physical exercises.

**Keywords:**

- cardiovascular system
- respiratory system
- physical fitness

**Action:**

- ☒ research service
- ☒ training and consulting offer

## Segmental body composition analysis

**Description of offer:** Segment analysis of body composition (Inbody 770, Tanita BC-418MA) includes the following parameters: TBW – total body water (litres and %), ECW – extracellular water (litres and %), ICW – intracellular water (litres and %), FM – fat mass (kg and %), FFM – fat-free mass, active (kg and %), BCM – body cell mass (kg and %), MM – muscle mass (kg and %), BMR – basal metabolic rate (kcal), BMI – body mass index, BCMI – body cell mass index, PA – phase angle between resistance and reactance, with the possibility of calculating muscle mass in particular body segments (right lower limb, left lower limb, right upper limb, left upper limb, right half body, left half body, upper body, lower body, torso).

**Potential uses:** This examination may be carried out for prophylactic purposes in order to check the general body condition and fitness. Segmental analysis of body composition is also recommended for people who are particularly physically active, especially athletes who systematically expand their muscle mass.

**Keywords:**

- body composition analysis
- adipose tissue

**Action:**

- ☒ research service
- ☒ training and consulting offer

## Assessment of balance in healthy persons and those with neurological or orthopaedic disorders

### Description of offer:

1. Balance and proprioceptive training on the Sigma balance platform, with the possibility to perform exercises in one plane and/or two planes, in a sitting or standing position, and on one or two legs. Tests performed: stability, dynamic, pendulum, path. Exercises are performed in four categories: very easy, easy, medium, difficult.
2. The testing on the stabilometric for Alfa coordination training allows to evaluate and train balance and stability under stable conditions for patients with neurological and orthopaedic disorders. Types of tests performed: dynamic, load distribution, Unterberger, pendulum, path, hunting, tracing.

### Potential uses:

- support in post-traumatic, postoperative, orthopaedic and neurological rehabilitation (balance control),
- support in sports rehabilitation (e.g. after fractures and twists of ankle, knee and hip joints).

### Keywords:

- sense of balance
- neurological disorders
- orthopaedic disorders

### Action:

- ☒ research service
- ☒ training and consulting offer

## Department of Theory and Methodology of Physical Education and Sport

### Scientific and research issues:

The Department conducts research on positive health determinants of children and youth as well as physical activity of elderly people. The interdisciplinary scientific problems in this field complement each other. They are included in research tasks, such as:

- physical activity in the optimisation of weight and body composition,
- health behaviours and social relations as well as their relationship with physical fitness and health on the example of school children and youth and students of the Kujawsko-Pomorskie region.

### SCIENTIFIC RESEARCH PROSPECTS

#### Business cooperation offer

DIAGNOSTIC TESTS, EXPERT OPINIONS, TRAINING AND CONSULTANCY FOR:

- medical services,
- care and rehabilitation centres,
- schools and sports centres.

#### Research services

DIAGNOSTICS OF PHYSICAL CHARACTERISTICS:

- body composition measurement,
- evaluation of posture using Moire's photogrammetric method,
- assessment of the shape of the feet using the computer CQ-ST feet assessment method,
- assessment of training and injury susceptibility with the use of the PRIMUS RS multifunctional dynamometer,
- recording of brain bioelectrical activity with apparatus to QEEG (detection of changes such as epileptic discharge, hemispheric asymmetries, slowing down or accelerating of brain functions),
- evaluation of neuropsychological and clinical parameters by means of the Vienna Test System,

<b>Research services</b>	<ul style="list-style-type: none"> <li>• assessment of physical fitness by means of physical fitness tests,</li> <li>• research on psychological and pedagogical aspects in the form of a survey.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• methodological consultancy in the field of physical education and health education,</li> <li>• leisure time entertainment officer,</li> <li>• handball instructor,</li> <li>• swimming instructor,</li> <li>• volleyball instructor,</li> <li>• summer camp carer,</li> <li>• corrective and compensatory gymnastics instructor,</li> <li>• physical recreation instructor.</li> </ul>

## Department of Team Sports

### Scientific and research issues:

The Department of Team Sports conducts research in the field of health in terms of lifestyle, physical development, physical fitness, body posture, health behaviour and education at various stages of human life, in particular:

- assessment of somatic structure and fitness,
- involvement in physical activity of children and youth from the Kujawsko-Pomorskie Voivodeship.

<b>SCIENTIFIC RESEARCH PROSPECTS</b>	
<b>Business cooperation offer</b>	<p>SERVICES FOR THE FOLLOWING SECTORS:</p> <ul style="list-style-type: none"> <li>• health,</li> <li>• rehabilitation,</li> <li>• physiotherapy,</li> <li>• education,</li> <li>• tourism and recreation.</li> </ul>
<b>Research services</b>	<p>THE PRACTICAL APPLICATION OF RESEARCH:</p> <ul style="list-style-type: none"> <li>• preparation of conditions for the comprehensive development of children and young people, prevention and health promotion. For example, an urban project called „Health Pathways” with an indication of the areas of implementation such as physical health, mental health, social health,</li> <li>• constructing teachers’ work plans and improving their physical fitness,</li> <li>• assessment of pro-health behaviours, body structure measurements and motor skills of children and adolescents.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• methodological consultancy in the field of physical education and health education,</li> <li>• corrective and compensatory gymnastics instructor,</li> <li>• physical recreation instructor.</li> </ul>





# **FACULTY OF ADMINISTRATION AND SOCIAL SCIENCES**

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## The Authorities

### Dean

Radosław Krajewski, Ph. D., D. Sc., Associate Professor

### Associate Dean for Scientific Research

Piotr Siuda, Ph. D.

### Associate Dean for Teaching

Joanna Gomoliszek, Ph. D.

## Contact Information



ul. Ogińskiego 16,  
85-092 Bydgoszcz



52 32 36 738



sekretariatwains@ukw.edu.pl



[www.wydzialnaukspolecznych.ukw.edu.pl](http://www.wydzialnaukspolecznych.ukw.edu.pl)

## Faculty Structure

- Institute of Philosophy
- Institute of Law, Administration and Management
- Chair of Scientific Information and Bibliology
- Chair of Sociology



## Brief Description of the Faculty

The Faculty of Administration and Social Sciences is an organisational unit of the University which educates students in six fields: administration, economics, philosophy, scientific information and librarianship, law in business and sociology.



Due to the heterogeneous structure of the Faculty, the scientific and research issues include both legal and economic sciences as well as humanistic sciences, and the scientific staff carries out a wide range of research and teaching tasks of an interdisciplinary nature.

The multifaceted approach allows Faculty students to acquire, apart from specialist knowledge, unique competences combining the skills of creative thinking, teamwork and rational argumentation, useful in various professional areas in today's demanding labour market. The modern approach to the research and didactic process of the Faculty translates into constant cooperation with the social and economic environment. In addition, research and teaching staff maintain regular contacts with foreign research centres (including Germany, France, Liechtenstein, Ukraine and Romania) by initiating and organising joint research projects, sitting on scientific boards of journals and conferences and being members of international scientific organisations.

Each unit within the Faculty boasts achievements in its own, distinctive scientific research field. The basic research areas of the Institute of Philosophy include the history of philosophy, philosophy of religion, philosophy of mind and artificial intelligence, ethics and aesthetics.

Extensive research conducted at the Institute of Law, Administration and Management currently covers issues such as document recognition and falsification of documents, protection of life and family in the criminal law, legal protection of monuments or ownership transformations of economies in transition.

In the study of the history of books and libraries, the Chair of Scientific Information and Bibliology pays special attention to church libraries and the history of books after World War II, the importance of quality in the activities of libraries and Internet services, women's and academic periodical press.

The research of the Chair of Sociology is carried out in the following areas: social consultations, contem-



porary mechanisms of participation in culture, social aspects of service of Polish soldiers abroad, consumer attitudes, innovation and creativity in communities and the functioning of the media. Currently, the staff of the Faculty consists of over 50 employees, including 3 full professors, 23 employees with a postdoctoral

degree and 23 with a doctoral degree. The further scientific development of the Faculty is planned through the acquisition of research grants, the organisation of numerous seminars and conferences, and intensive publishing activities.







# **INSTITUTE OF PHILOSOPHY**

[www.filozofia.ukw.edu.pl](http://www.filozofia.ukw.edu.pl)





## The Authorities

Prof. Dariusz Łukasiewicz, Ph. D., D. Sc.

## Contact Information



ul. Ogińskiego 16,  
85-092 Bydgoszcz



52 32 36 709



ifukw@ukw.edu.pl



[www.filozofia.ukw.edu.pl](http://www.filozofia.ukw.edu.pl)

## Structure

- Chair of Logic and Ontology
- Department of the History of Philosophy
- Department of Ethics and Social Philosophy

**Scientific and research issues:**

The research activities of the Institute of Philosophy include issues from all basic disciplines of philosophy, such as ethics, logic, ontology, history of philosophy, aesthetics, philosophy of politics, philosophy of religion, social philosophy, knowledge of contemporary multicultural society and research on the border of cognitive science, neuropsychology and neuropsychiatry. This is confirmed by the subject matter of the following research projects carried out in the Institute:

- the problem of existence, perception and time in contemporary philosophy and logic,
- Polish philosophy of the 20th century,
- selected issues of contemporary philosophy,
- the meaning of „practical philosophy“ in the philosophical tradition,
- philosophy, aesthetics, poetry, literature, art from the creator's perspective,
- history and metaphysics. In search of the identity of modern philosophy,
- synthesis of monistic thought in Western philosophy,
- naturalism in contemporary philosophical thought,
- objective markers of cognitive, emotional and psychomotor functions in people with nervous system disorders from the experimental perspective and the concept of cortico-subcortical loops,
- concepts of man, person and human nature in philosophical tradition.

## Chair of Logic and Ontology + Cognitive Studies Laboratory

**Scientific and research issues:**

Apart from logic and ontology, important fields of research include: epistemology, especially the theory of rational beliefs, as well as Brentanism, phenomenology and Polish analytical philosophy.

Other research areas are focused around:

- philosophy of politics,
- social philosophy,
- philosophy of religion,
- Polish analytical philosophy, especially the Lvov-Warsaw School.

The Chair also specializes in:

- philosophy of Newtonian physics,
  - metaphysics, especially the various aspects of world unity
- and
- empirical studies of cognitive processes of addicts.

**The Cognitive Studies Laboratory** has an interdisciplinary character – it conducts research on psychological functions at the intersection of neurobiology, medicine, neuropsychiatry, neuropsychology, clinical psychology, philosophy of mind, philosophy of nature, philosophy of psychiatry, linguistics and musicology.

As part of research projects, research is carried out in healthy people and with mental diseases and nervous system injuries who suffer from functional disorders of both the autonomic and central nervous systems.

### SCIENTIFIC RESEARCH PROSPECTS

#### Business cooperation offer

ANALYTICAL SERVICES, SPECIALIST CONSULTATIONS, SCIENTIFIC COOPERATION:

- with medical units and business entities manufacturing equipment or software for persons with mental disorders;
- RESEARCH SERVICES USING APPARATUS FOR THE ASSESSMENT OF PSYCHOMOTOR AND COGNITIVE FUNCTIONS.

#### Research services

- diagnostics in neuropsychology and neuropsychiatry.

### Training and consulting services

COLLECTIVE AND INDIVIDUAL TRAINING COURSES AS WELL AS CONFERENCES, SPECIALIST CONSULTATIONS IN THE FIELD:

- ethics,
- self-presentation,
- interpersonal communication,
- logics.

ANALYTICAL SERVICES IN THE FIELD OF LOGICAL CONGRUENCE OF DATA; TRAINING SERVICES ON ADDICTION IN PSYCHIATRY.

## Department of the History of Philosophy

### Scientific and research issues:

Research interests in the field of the history of philosophy are primarily focused on:

- the philosophy of ancient Greece, especially the thoughts of Socrates and Plato,
- medieval philosophy,
- modern German and French philosophies, with particular emphasis on the philosophy of religion, Immanuel Kant and the French Enlightenment (Encyclopaedists),
- Polish philosophy of the 20th century, especially neoscholastics and phenomenology,
- contemporary French postmodern philosophy.

Additional research fields include:

- aesthetics in which the notion of the creator and creativity are explored, as well as the philosophy of the nineteenth century, especially the philosophy of F. Nietzsche and the philosophy of culture that emerges from it,
- metaphysics of man and problems of the individuality of human nature.

### SCIENTIFIC RESEARCH PROSPECTS

#### Business cooperation offer

- cooperation in creation of joint scientific projects, specialist consultations on problems related to scientific and research issues of the unit,
- participation in the works of scientific councils, awards boards and jurors' bodies in competitions in the field of philosophy, organisational committees of various projects promoting philosophy.

## Department of Ethics and Social Philosophy

### Scientific and research issues:

The Department conducts research mainly in the area of:

- ethics,
- hermeneutics.

Great emphasis is also placed on the issues of:

- general ethics,
- social ethics,
- bioethics.

In addition, the scope of interest includes contemporary German philosophy (mainly hermeneutics).

### SCIENTIFIC RESEARCH PROSPECTS

#### Business cooperation offer

- scientific cooperation, specialist consultations on problems related to and research issues of the unit.



# **INSTITUTE OF LAW, ADMINISTRATION AND MANAGEMENT**

[www.prawoiadministracja.ukw.edu.pl](http://www.prawoiadministracja.ukw.edu.pl)



## The Authorities

Janusz Wiśniewski, Ph. D., D. Sc., Associate Professor

## Contact Information



ul. Ogińskiego 16,  
85-092 Bydgoszcz



52 32 36 743



sekr.ipaiz@ukw.edu.pl



[www.prawoiadministracja.ukw.edu.pl](http://www.prawoiadministracja.ukw.edu.pl)

## Structure

- Department of Economy, Public Finance and Management
- Department of Penal Sciences and Forensics
- Department of Administrative Law and Environmental Protection Law
- Department of Substantive and Procedural Civil Law
- Department of Constitutional Law and History of Law
- Department of Labour Law and Social Security
- Laboratory of Propedeutics of Computer Science



**Scientific and research issues:**

At present, the scientific activity of the Institute of Law, Administration and Management covers the following issues: selected aspects of the activity of public administration in Poland, document recognition and falsification of documents, protection of life and family in the criminal law, ownership transformations of economies in transition, rationality of regulations in the Polish environmental protection law, security and social issues from the perspective of regions, the impact of the crisis of public finance on the international investment position. The scope of research evaluates dynamically and in parallel to the teaching activity, which translates into adjusting the Institute's offer to the requirements of the labour market which expects creative specialists and high-class professionals.



## Department of Substantive and Procedural Civil Law

**Scientific and research issues:**

The Department of Substantive and Procedural Civil Law conducts research on issues in the field of:

- substantive and procedural civil law, in particular the judicial inquiry procedure in civil cases, and
- enforcement and bankruptcy proceedings.

### SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	TRAINING SERVICES, SPECIALIST CONSULTATIONS FOR: <ul style="list-style-type: none"> <li>• private entities,</li> <li>• public administration.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• training in civil proceedings, including bankruptcy proceedings.</li> </ul>

## Practical Problems of Bankruptcy Proceedings

**Description of offer:** Training in basic practical problems of bankruptcy proceedings.

**Potential uses:** Increasing the level of knowledge of entrepreneurs and administration employees in the field of bankruptcy and restructuring law.

**Keywords:**

- bankruptcy
- bankruptcy proceedings

**Action:**

- ☒ training and consulting offer

# Department of Labour Law and Social Security

## Scientific and research issues:

The Department of Labour Law and Social Security focuses on issues related to labour law and social security, such as:

Labour law:

- flexible forms of work (teleworking, temporary work, self-employment),
- rights related to parenthood,
- legal framework for creating relationships in employment,
- employment promotion and labour market institutions;

Social security:

- problems of accidents at work,
- employment of disabled persons.

The research results and scientific achievements are systematically presented by the employees to the wider academic community in the form of publications and lectures delivered at national and international conferences or during debates organised in cooperation with active scientific circles.

## SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	<ul style="list-style-type: none"> <li>• expert opinions and legal consulting for industry and representatives of various lines of business,</li> <li>• consultancy in the field of human resources management and business negotiations.</li> </ul>
<b>Research services</b>	<p>RESEARCH SERVICES:</p> <ul style="list-style-type: none"> <li>• analyses of the possibility of introducing flexible forms of work in business entities,</li> <li>• analysis of human resources management methods.</li> </ul>
<b>Training and consulting services</b>	<p>TRAINING SERVICES IN THE FIELD OF:</p> <ul style="list-style-type: none"> <li>• changes in labour law, in particular with regard to employment contracts and parental leaves,</li> <li>• human resources management and employee bargaining.</li> </ul>

## Human Resources Management

**Description of offer:** Training in human resources management and employee bargaining.

**Potential uses:** The offer is addressed to people who want to improve their efficiency and quality of work, as well as acquire skills in team management and interpersonal communication.

### Keywords:

- human resource management
- employee bargaining

### Action:

- ☒ research service
- ☒ training and consulting offer

## Department of Penal Sciences and Forensics

### Scientific and research issues:

The employees of the Department of Penal Sciences and Forensics deal with the following issues:

- criminal law (substantive and procedural law, executive criminal law, law of offenses),
- prison law,
- criminology and forensics.

The research conducted is particularly focused on forgery of documents, identification of persons on the basis of hand-written documents, authenticity of painting signatures, as well as protection of life and family in the criminal law.

### SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	<p>EXPERT SERVICES AND CONSULTANCY IN THE FIELD OF TESTING AUTHENTICITY OF DOCUMENTS FOR:</p> <ul style="list-style-type: none"> <li>• offices,</li> <li>• banks,</li> <li>• state and private enterprises of various industries.</li> </ul>
<b>Research services</b>	<p>EXPERT OPINIONS CONCERNING:</p> <ul style="list-style-type: none"> <li>• authenticity of documents,</li> <li>• identification of signatures and handwriting.</li> </ul>
<b>Training and consulting services</b>	<p>TRAINING SERVICES AND CONSULTANCY IN THE FIELD OF:</p> <ul style="list-style-type: none"> <li>• authenticity of documents,</li> <li>• protection of documents against counterfeiting and falsification,</li> <li>• identification of signatures and handwriting.</li> </ul>

## Checks on the Authenticity of Documents

**Description of offer:** The thematic offer includes:

1. preparation of expert opinions on the authenticity of official and private documents as well as the authenticity of signatures and handwritings
- and
2. training and consultancy on the possibility of protecting documents against counterfeiting and falsification, as well as on the methods and possibility of detecting forged documents.

**Potential uses:** Expert opinions may be used for meeting the internal needs of the contracting entity, as well as in preparatory proceedings or proceedings before a court (criminal or civil) and administrative authorities as so-called private opinions (i.e. issued on the order of an entity other than a court or law enforcement authorities).

#### Keywords:

- documents
- authenticity of documents
- handwriting identification
- identification of signatures

#### Action:

- ☒ research service
- ☒ training and consulting offer

# Department of Constitutional Law and History of Law

## Scientific and research issues:

The Department of Constitutional Law and History of Law conducts research and teaching devoted to issues related to constitutional law and the history of law.

Thematic blocks:

### CONSTITUTIONAL LAW:

- constitutional rights and freedoms in legal and comparative terms,
- constitutional principles, in particular constitutional regulations governing relations between the state and churches and religious associations,
- legal and political issues, especially constitutional regulations concerning the functioning of local government;

### HISTORY OF LAW:

- history of Polish parliamentarianism,
- self-government of the gentry in Poland,
- rural law and organisation of rural judiciary in the First Polish Republic,
- local government in Greater Poland (Wielkopolska) and Pomerania in the inter-war period and issues concerning the Bydgoszcz press,
- press studies and press history.

## SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	RESEARCH SERVICES AND SPECIALIST CONSULTATIONS IN THE FIELD OF SCIENTIFIC AND RESEARCH INTEREST OF THE UNIT FOR: <ul style="list-style-type: none"> <li>• private entities,</li> <li>• public administration.</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• analyses and opinions in the field of press law and copyright law.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• training for spokespersons and press institutions in the field of press law and copyright law.</li> </ul>



# **CHAIR OF SCIENTIFIC INFORMATION AND BIBLIOLOGY**

[www.kinib.ukw.edu.pl](http://www.kinib.ukw.edu.pl)





## The Authorities

Rev. Zdzisław Kropidłowski,  
Ph. D., D. Sc., Associate Professor

## Contact Information



ul. Szymanowskiego 3,  
85-074 Bydgoszcz



52 32 66 437



[kabib@ukw.edu.pl](mailto:kabib@ukw.edu.pl)



[www.kinib.ukw.edu.pl](http://www.kinib.ukw.edu.pl)

## Structure

- Department of Bibliology
- Department of Scientific Information

**Scientific and research issues:**

The research work carried out in the Chair covers two basic bibliological areas: the science of books and libraries and the science of information.

Individual research undertaken by employees focuses on the following issues:

- history of books in ancient times, modern times and libraries, especially Christian libraries, libraries in Pomerania, manuscript and printed books,
- history of bookbinding,
- church libraries,
- quality and access to information,
- periodical press,
- access to information sources and the Polish minority in Lithuania and the Czech Republic,
- research and forecasting of information processes, with particular emphasis on Bydgoszcz and Kujawsko-Pomorskie Voivodship.



## Department of Scientific Information

**Scientific and research issues:**

The Department of Scientific Information conducts research in the field of bibliography, in particular on:

- quality in the activities of libraries and websites,
- women's and academic periodicals,
- the Polish minority in Lithuania and the Czech Republic – libraries, books, information technologies,
- bibliography – theory, methodology, practice,
- organisation of information activities,
- educational (pedagogical) information systems,
- functioning of information services in the information space.

### SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	<p>RESEARCH SERVICES AND SPECIALIST CONSULTATIONS IN THE FIELD OF SCIENTIFIC AND RESEARCH INTEREST OF THE UNIT FOR:</p> <ul style="list-style-type: none"> <li>• libraries and scientific information points,</li> <li>• schools,</li> <li>• entities operating in the Internet space,</li> <li>• private entities,</li> <li>• public administration.</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• knowledge brokerage services in various fields,</li> <li>• research and forecasting of information processes, with particular emphasis on Bydgoszcz and Kujawsko-Pomorskie Voivodship.</li> </ul>
<b>Training and consulting services</b>	<p>SPECIALIST CONSULTATIONS WITH REPRESENTATIVES OF COMPANIES PRODUCING AND DISTRIBUTING SOFTWARE, DATABASES AND SERVICES FOR LIBRARIES AND INFORMATION INSTITUTIONS;</p> <p>TRAINING SERVICES:</p> <ul style="list-style-type: none"> <li>• editorial tools in the work of the librarian,</li> <li>• ethics in the activities of libraries and information institutions – practical workshops,</li> <li>• strategic management in the practice of libraries and information centres.</li> </ul>

# Department of Bibliology

## Scientific and research issues:

The research areas of the Department of Bibliology are as follows:

- history of books (in ancient times, modern times) and libraries (Christian libraries in Pomerania),
- manuscript and printed books, especially protection of collections after World War II,
- history of bookbinding,
- church libraries.

## SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	<p>SPECIALIST CONSULTATIONS, PARTICIPATION IN EXPERT AND JURORS' BODIES IN THE FIELD OF SCIENTIFIC AND RESEARCH INTEREST OF THE UNIT FOR:</p> <ul style="list-style-type: none"> <li>• libraries and scientific information points,</li> <li>• schools,</li> <li>• public entities, e.g. museums.</li> </ul>
<b>Research services</b>	<ul style="list-style-type: none"> <li>• library education programmes – e-learning courses for the library and scientific information: e-library training.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• training and educational offer, organization of competitions, tests in the field of book knowledge, library and new media for school students in various age groups.</li> </ul>



# **CHAIR OF SOCIOLOGY.**

[www.socjologia.ukw.edu.pl](http://www.socjologia.ukw.edu.pl)



## The Authorities

Andrzej Tarczyński, Ph. D., D. Sc., Associate Professor

## Contact Information



ul. Szymanowskiego 3,  
85-074 Bydgoszcz



52 32 66 437



socjologia@ukw.edu.pl



[www.socjologia.ukw.edu.pl](http://www.socjologia.ukw.edu.pl)



### Scientific and research issues:

Research of employees of the Chair of Sociology is focused on contemporary societies in terms of their dynamics and diversity.

The analyses cover the issues of social transformations in the economy; creation and implementation of public policy as an expression of cooperation between public administration, non-governmental organizations, urban movements and residents. In this context, issues are examined that are related, inter alia, with:

- social communication,
- public participation,
- public consultations,
- social aspects of collective management in Polish housing communities.

The scientific activity of the Chair is also related to the niche trend: the sociology of the army, with particular emphasis on research topics such as:

- military family as a greedy institution,
- social aspects of the service of Polish soldiers outside the country.

Research often combines social and economic aspects, particularly in the case of analyses of the social function of an enterprise and related topics:

- corporate social responsibility,
- consumer attitudes,
- innovation and creativity in communities,
- the functioning of the media,
- contemporary mechanisms of participation in culture - sociological analysis.



## SCIENTIFIC RESEARCH PROSPECTS

<b>Business cooperation offer</b>	RESEARCH AND TRAINING SERVICES FOR: <ul style="list-style-type: none"> <li>• offices and public administration,</li> <li>• private entities from various sectors.</li> </ul>
<b>Research services</b>	THE APPLICATION OF RESEARCH IN PRACTICE: <ul style="list-style-type: none"> <li>• consumer research,</li> <li>• marketing research,</li> <li>• studies on innovation and creativity,</li> <li>• preparation of development strategies,</li> <li>• preparation of communal revitalisation programmes,</li> <li>• preparation and implementation of public consultations.</li> </ul>
<b>Training and consulting services</b>	<ul style="list-style-type: none"> <li>• educational activities, workshops and training,</li> <li>• conferences and seminars</li> </ul>

## Marketing, Prototype Testing and Social Studies

**Description of offer:** The market success of any innovative product or service depends on the extent to which it meets the expectations of future customers. Even in the initial phase of designing innovations, it is worth defining in detail the needs of target consumers to ensure that the final product fully meets them.

The Chair of Sociology of the Kazimierz Wielki University offers services of designing and carrying out marketing research on new and existing products:

- research on the demand for a given product or service, research on consumer expectations,
- marketing testing of prototypes.

Test methods and techniques used:

- demonstration tests, usage tests,
- PAPI, CAPI, IDI, CAWI individual interviews, CATI telephone interviews,
- Focus group interviews,
- observations, mystery shopper,
- desk research, analysis of existing data.

Moreover, social studies are conducted, e.g. opinion polls, socio-demographic analyses for the needs of strategic documents, analyses of the functioning of organisations and institutions, image surveys.

### Keywords:

- social research
- marketing research
- consumer research
- prototyping
- survey
- PAPI focus studies
- CAPI
- IDI
- CAWI
- CATI

**Potential uses:** Introduction of a new design or product. Evaluation of product, brand and company perception. Diagnosis of the needs of residents and consumers. Customer satisfaction assessment.

### Action:

- ☒ research service



# FACULTY OF MUSIC EDUCATION

[www.muzyka.ukw.edu.pl](http://www.muzyka.ukw.edu.pl)



## The Authorities

### Dean

Prof. Bernard Mendlik, Ph. D., D. Sc.

### Associate Dean

Witold Kawalec, Ph. D.

## Contact Information



ul. Chodkiewicza 30,  
85-064 Bydgoszcz



52 34 19 275



dyrygent@ukw.edu.pl



[www.muzyka.ukw.edu.pl](http://www.muzyka.ukw.edu.pl)

## Structure

- Chair of Conducting
- Chair of Music Education, Theory and Promotion of Music
- Chair of Instrumental and Vocal Performance

## Brief Characteristics

**The Faculty of Music Education was formed on 1 January 2015, through a transformation of the Institute of Music Education. Currently, this thriving institution attracts students with both an interesting educational offer in the field of artistic education in music with many specialties, and its research and artistic achievements.**

The Faculty conducts teaching, artistic and research activities as well as development and innovation in the field of artistic disciplines, artistic education and promotion of musical culture. The task of the institution is to take care of the comprehensive development of its academic staff and students by shaping original creators of music and promoters of cultural events.

The Faculty of Music Education is staffed by high-class specialists, largely from music academies. They include instrumentalists, vocalists, conductors and music theorists, who, apart from teaching, are involved in a wide range of concert and research activities. The Faculty organises the National Festival of Academic Choirs under the name Academic Carol Singing and initiated the University Conductors' Forum – the Young Choirmasters' Competition. Research activities include the organisation of research sessions and conferences,

as well as the publication of research results, e.g. in the University's journal entitled 'Music. History. Theory. Education' and in research periodicals published at other academic centres in Poland and abroad. In addition, the Faculty is authorised to grant a PhD degree in music in the discipline of conducting.

The Faculty has a vibrant Academic Choir which performs at the most important events of the University and at numerous cultural events in the city and the region. The Academic Choir has received many awards and distinctions at national and international festivals and choir competitions. For many years, creative cooperation has also been continued with such important Polish music institutions as the Pomeranian Philharmonic in Bydgoszcz, the Baltic Philharmonic in Gdańsk, the Opera Nova in Bydgoszcz and the Baltic Opera in Gdańsk.

### Scientific and research issues:

The Faculty of Music Education is the only artistic faculty at the university which is a centre for research on various aspects of the musical culture. Individual research undertaken by academics focuses on:

- Polish and foreign choral, vocal and instrumental music,
- training of conductors of school ensembles – assumptions and facts,
- choral music of Eastern and Western cultures,
- music teacher – a model for the future,
- methods and theory of music education,
- modern systems for the teaching of music,
- the emotional and intellectual competences of the teacher,
- forms of integration of music during music lessons,
- the importance of listening to music in order to increase the sensitivity of listeners,
- the idea of the teaching of music and teachers' education in music and methods of teaching music,
- teachers' professional ranks,
- promotion of culture: goals, tasks and functions,
- management and marketing at cultural institutions,
- promotion of cultural goods,
- cultural heritage: protection, promotion and marketing.

### SCIENTIFIC RESEARCH PROSPECTS

#### Business cooperation offer

COOPERATION IN THE CREATION OF JOINT ACADEMIC, ARTISTIC OR EDUCATIONAL PROJECTS, AS WELL AS CONCERTS AND MUSICAL EVENTS FOR:

- schools,
- cultural institutions,
- church institutions,
- integration and rehabilitation centres,
- other local government units,
- business institutions,
- representatives of the media (the press, radio, television and the Internet).



<b>Research services</b>	<ul style="list-style-type: none"> <li>• participation in the work of scientific councils, award committees and music competition juries, organising committees of various culture and music promotion projects,</li> <li>• music programmes for children of preschool and school age,</li> <li>• possibility of recording your own demo material at WEM Recording Studio,</li> <li>• musical setting of events (meetings with the authors, vernissages, exhibitions, etc.),</li> <li>• hire of the Collegium Copernicanum Concert Hall with the option to use professional sound-amplifying equipment.</li> </ul>
<b>Training and consulting services</b>	<p>EXPERT CONSULTATIONS ON:</p> <ul style="list-style-type: none"> <li>• conducting instrumental / vocal and instrumental ensembles of various compositions (chamber music),</li> <li>• choralism,</li> <li>• light music,</li> <li>• rhythmic and music therapy in music education,</li> <li>• teaching people to play musical instruments,</li> </ul> <p>WORKSHOPS FOR TEACHERS: 'INTERPRETATION OF SONGS AND VOCAL PEDAGOGY'</p>

## Hire of the Collegium Copernicanum Concert Hall

**Description of offer:** We offer the hire of a hall in the representative building of Collegium Copernicanum, aspiring to be the artistic showcase of the University of Kazimierz Wielki. The building, located at ul. Kopernika 1 in the centre of Bydgoszcz, was built in the Art Nouveau style between 1905 and 1906, designed by Berlin architects Carl Zaar and Rudolf Vahl, and was entered in the provincial register of historical buildings in 1992. Today, after a thorough renovation, it meets the requirements for modern educational buildings. The elegant Aula Copernicanum, with its unique architectural layout and climate, has a capacity of about 200 guests, allowing for the organization of both intimate concerts, meetings and presentations, and larger conferences and training sessions. In the case of music projects, excellent acoustics is an additional advantage of the interior. Upon request, it is possible to provide:

- audiovisual equipment: projector + presentation screen,
- concert sound system,
- catering space,
- performance / concert by musicians or the choir of the Faculty of Music Education,
- parking spaces.

**Potential uses:** Place for organizing concerts, conferences, training sessions or business meetings for public and private entities.

**Keywords:**

- hire of rooms

**Action:**

- ☒ other

## Performance/concert by musicians or the choir of the Faculty of Music Education

**Description of offer:** The offer includes:

- the musical setting of cultural events, meetings with the authors, vernissages, exhibitions, celebrations of national holidays, etc., with the possibility to select the repertoire depending on the nature of the event or
- co-creation of artistic/educational and artistic/cultural projects.

Repertoire possibilities:

- solo concerts: classical or light music,
- chamber concerts: classical, light, instrumental, or vocal and instrumental music,
- choir concerts, including performance of the Choir of the Kazimierz Wielki University; the repertoire of the mixed choir includes works of composers of all eras, a cappella music and great vocal and instrumental music.

**Potential uses:** Artistic and musical activities for public and private entities.

**Keywords:**

- concert
- choir

**Action:**

- ☒ other

## Publication financed from the project



Ministerstwo Nauki  
i Szkolnictwa Wyższego



Unia Europejska  
Europejski Fundusz  
Rozwoju Regionalnego



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### Uniwersytet Kazimierza Wielkiego

ul. Chodkiewicza 30,  
85-064 Bydgoszcz

Prorektor ds. Rozwoju i Współpracy  
e-mail: [wspolpraca@ukw.edu.pl](mailto:wspolpraca@ukw.edu.pl)

Centrum Transferu Technologii i Innowacji  
e-mail: [innowacje@ukw.edu.pl](mailto:innowacje@ukw.edu.pl)

free information material

[WWW.UKW.EDU.PL](http://WWW.UKW.EDU.PL)

