LLP ERASMUS

at

West Pomeranian University of Technology

Szczecin
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I. About West Pomeranian University of Technology, Szczecin

1. General introduction

The West Pomeranian University of Technology, Szczecin is a university linking the long-term tradition of the University of Agriculture in Szczecin and Szczecin University of Technology. Its educational offer and location make it an attractive place of study for ambitious young people ready to invest into their career and willing to build innovative, knowledge-based society in future.

**ORIGINS**

*University of Agriculture in Szczecin*
- established July 17th, 1954 as a School of Agriculture in Szczecin,
- 1972 – University of Agriculture in Szczecin
- 4 faculties: Faculty of Biotechnology and Animal Husbandry, Faculty of Economics and Organization of Food Economy, Faculty of Environmental Management and Agriculture, Faculty of Food Sciences and Fisheries

*Szczecin University of Technology*
- December 1st, 1946 – the School of Engineering comes into being on the basis of a decree from Minister of Education of January 1947,
- September 1st, 1955 – the School of Engineering is elevated to the rank of University of Technology, by virtue of a decree of the Council of Minister of September 3rd, 1955
- 6 faculties: Faculty of Civil Engineering and Architecture, Faculty of Electrical Engineering, Faculty of Mechanical Engineering and Mechatronics, Faculty of Computer Science and Information Technology, Faculty of Maritime Technology, Faculty of Chemical Engineering

As a result of merging two universities, the West Pomeranian University of Technology holds 10 faculties, 35 fields of study, over 15,000 students on full-time and nonstationary studies. The University has a huge and valuable potential which guarantees proper professional life preparation for its students. Moreover, the University has the right to grant the title of habilitated scientific doctor in 17 disciplines and habilitated doctor in 9 disciplines.

Recognizing the benefits resulting from international cooperation, the West Pomeranian University of Technology is an institution open to all kind of projects enhancing internationalization processes and introducing an international dimension to its educational and research activities. A special invitation is open to foreign students willing to complete both full degrees and part time programs during exchange periods (e.g. one or two semesters in the framework of Erasmus program).
2. **Faculties**

**Faculty of Biotechnology and Animal Husbandry**

History of the Faculty of Biotechnology and Animal Husbandry began in September 1955. For years it has been educating engineers and masters in natural sciences. The Faculty structure consists of 15 departments. From 1969 the Faculty has had the right to grant doctor degrees and from 1976 it has had the full academic rights.

At present the Faculty employs 83 academic teachers.

**The Faculty offers three courses of study:**
- **Biology** – specializations: agro-biology, biology of waters, biology of animals;
- **Biotechnology** – specializations: biotechnology in plant production, and environment
- **Animal Husbandry** – specializations: ecology and prophylaxis of animals, animal raising, agrotourism

The Faculty holds lecture halls equipped with modern audiovisual appliances and laboratories in a new generation equipment for cell cultures, chromatography and spectrophotometers, hematological and biochemical analyzers, microscopes and sets for the micromanipulation.

**Faculty of Civil Engineering and Architecture**

The Faculty of Civil Engineering and Architecture began the first academic year in 1946 under the name of Engineering Faculty. The Faculty educates over 2500 students in full time and nonstationary studies. Students are educated in two main courses: civil engineering and architecture. Both students and teachers are involved in international relations with foreign universities and ready to receive their students. The studies are run in the European Credit Transfer System (ECTS) which allows students to recognize their learning achievements.
Proposed courses of study:

- **Architecture and urban planning**
- **Pattern designing**
- **Civil engineering** – specializations: European civil engineering management, water resources and environmental engineering, construction engineering, hydro engineering;
- **Environmental engineering** – specializations: heating and ventilation, water supply systems and the sewage system, security techniques of land objects, alternative sources of energy in the construction.

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The Faculty of Electrical Engineering

The Faculty was established in 1946 as one of three Faculties of High School of Engineering. From 1971 the Faculty has the right to title doctor's degree of technical theories in discipline of electrotechnology. In June 2002 the Faculty of Electrical Engineering got full academic laws in this discipline, i.e. of authorizing to title of habilitated doctor. From 2004 the Faculty has also the right to grant the doctor’s degree of technical theories in the discipline automation and robotics.

Courses of study:

- **Automatic control and robotics** – specializations: computer control system, automation of industrial processes, information technology of the production automation;
- **Electronics and telecommunication** – specializations: electronic systems, telematic radio communication system, telematic optoelectronic systems;
- **Electrical engineering** – specializations: electrical power engineering, information technology in electrotechnology, utilization of electrical energy.

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The Faculty of Economics and Organization of Food Economy

The Faculty of Economics and Food Organization was established upon a Decree no 16 of the Minister of Science and Higher Education dated September 1st, 1987, due to the scientific achievements, development of the academic staff and the demand of the practice for classified staff and the economic knowledge.
The Faculty offers the following courses of study:

- **Management** – specializations: manager’s econometrics, economics of tourism, managerial accountancy, e-business, HR management, economics of trade and service, economics and social insurance, non-profit organization management, logistics within a company, management and real estate trade agency;
- **Economics** – specializations: accountancy and finance, economics and management enterprise, strategies of economic development, employment of mathematical method and in economy computer scientist (informatics), economy estate, insurances, economics of tourism, electronic business.

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**Faculty of Computer Science and Information Technology**

The history of the Faculty goes back to the year 1971 when the Factory of the Theory of Mechanisms and Bases of the Automatic Regulating comes into being. May, 28 1999 on the basis of the regulation of the Minister for National Education the Faculty of Computer Science and Information Technology is formed.

Courses of study:

- **Informatics** – specializations: computer system and software, software engineering, internet in managing, designing and managing IT projects, computer graphics and multimedia systems, computer systems and mobile, intelligent technologies computer applications,
- **Management and engineering of production** – specializations: e-technologies in the production and managing, financial engineering, management quality of software production, quality management of software production, managing projects and innovations, engineering of the quality, business administration.

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**Faculty of Mechanical Engineering and Mechatronics**

The Faculty of Mechanical Engineering and Mechatronics was established in 1946. The Faculty educates over 2000 students in full time and nonstationary studies. The Faculty has the authority to grant both doctors degrees: DSc and PhD in the field of Construction and Operation of Machinery.
Courses of study:

- **Mechanics and mechanical engineering** – specializations: computer aided machine design and manufacturing, welding engineering, automation of manufacturing processes, machine technology, power engineering equipment, maintenance of road vehicles;
- **Materials engineering**
- **Management and engineering of production** – specializations: quality engineering, enterprise management;
- **Transport** – specializations: transport organisation, road traffic engineering;
- **Mechatronics**

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The Faculty of Environmental Management and Agriculture was established in 1954 and includes 32 organization units. The Faculty holds the right to grant the degrees of scientific doctor and habilitated doctor of agricultural science in agronomy, doctor of agricultural science in environmental management, agricultural engineering and horticulture.

The Faculty employs 163 academic teachers, including 27 professors, 31 habilitated doctors, 104 doctors and 61 engineering and technical workers and 14 administrative officers.

**Proposed courses of study:**

- **Landscape architecture**
- **Environmental protection** – specializations: environmental protection, rehabilitation and developing lands, evaluation of the state and threats of the environment, preservation of soils, conservation of nature, environmental protection agricultural, protection of waters;
- **Horticulture** – specializations: production of fruit, vegetables and herbs, developing insides and areas of green, shaping areas of green, ornamentals, herbal plants, fruit farming, market gardening;
- **Agriculture** – specializations: agro-business, agro-tourism, agricultural chemistry, agronomy, protection of plants, organic farming;
- **Agricultural and forestry technology** – specializations: infrastructure and eco-technics, agro-power engineering and computer systems; technology and services in forestry, computer science and consulting in agricultural and forest technology; technology in agriculture, forestry and the environmental protection, managing and organization in agricultural and forest technology.
Faculty of Food Sciences and Fisheries

The Faculty of Food Science and Fisheries was established in 58 years ago as Faculty of Fishery by the virtue of Enactment of the Minister of Higher Education dated September 1st, 1951. The Faculty has full academic rights.

Proposed courses of study:

- **Fisheries** – specializations: fishing biotechnology, aquaculture and the ecotourism managing, management of resources of the aquatic environment;
- **Food technology and human nutrition** – specializations: food technology and biotechnology, analysis and managing the food quality, technology of fish products, human nutrition;
- **Commodity science** – specializations: Commodity science of the food and substances, commodity science of fish, commodity science of plant products, commodity science of animal products.

Faculty of Maritime Technology

The first students of the Faculty began their studies in 1960. In 2005 the Faculty educated over 1000 students in full time and part time studies. The Faculty employs about 50 academic teachers - Doctors, Ph. D, professors and professors.

Laboratories are equipped with modern research and teaching posts and with computer stances for students.

Courses of study:

- **Ocean technology** – specialisations: naval architecture, construction and operation of ship power plants, safety engineering in ocean technology, refrigeration and air-conditioning, computer methods in maritime technology, design of power engineering systems;
- **Transport** – specializations: integrated water and land transport, refrigeration and fuel transport, harbour and industrial transport;
- **Safety engineering** – specializations: fire safety engineering.
The Faculty of Chemical Engineering was founded in 1947. The Faculty is the significant teaching and research centre of the West Pomeranian University of Technology. Educational and research activities of the Faculty are focused on i.e. chemistry of solids, catalytic processes and catalysts in chemical engineering, chemical and process engineering.

Courses of study:

- **Chemical technology** – specializations: inorganic chemical technology, organic chemical technology, technology of plastics, biotechnology;
- **Environmental protection** – specializations: trial computer science, processes and devices in the environmental protection, managing and the exploitation in production systems, processes and apparatuses of the chemical industry, bioprocess engineering, process engineering;
- **Chemical engineering** – specializations: processes and apparatuses in the environmental protection, technologies of environmental protection and eco-friendly materials, analyst in the environmental protection.
- **Commodity science** – specializations: commodity science of large-tonnage articles, commodity science of small-tonnage articles
II. About Lifelong Learning Programme ERASMUS

1. General information

The Erasmus programme is based on a educational and training cooperation between colleges and universities in EU and it is aimed to support co-operation actions among higher education institutions across Europe. It caters not only for students, but also for professors and other academic staff who want to teach abroad and for university staff who want to be trained abroad. The Erasmus programme pays great attention to mobility and furthering career possibilities through learning.

The Program is named after Dutch philosopher, humanist and theologian Erasmus of Rotterdam (1465-1536). Erasmus, as other outstanding Renaissance men, studied in many centers of higher education in various European cities, such as Paris, Leuven and Cambridge. His views on the education were permeated with great humanism.

From academic year 2007/2008 Erasmus is a part of the Lifelong Learning Programme – a new program of the European Union in the education area and of vocational training, predicted for years 2007-2013.

Erasmus countries participating in the program:

- **27** countries of the European Union,
- **3** countries of the European Economic Area – *Iceland, Lichtenstein, Norway*,
- **Turkey**, as a candidate country.

The Erasmus programme enables students:

- realization of a part of study at foreign university,
- undergoing the practice in the foreign enterprise,
- improving the knowledge of foreign languages,
- establishing new acquaintances,
- getting to know other cultures,
- get acquainted to the system of the education and teaching methods in other country.

The Erasmus programme also enables universities developing international cooperation, extending teaching offer, it helps internationalizing the education.
2. Erasmus at West Pomeranian University of Technology, Szczecin

West Pomeranian University of Technology participates in the Erasmus programme since 1999.

Currently the West Pomeranian University of Technology cooperates in the academic exchange of students and teachers with over 90 partner universities in Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Holland, Hungary, Italy, Ireland, Latvia, Portugal, Romania, Sweden, Spain, Turkey.

The main strategic goals and priorities of the West Pomeranian University of Technology in the accomplishment of Erasmus programme for the years 2007-2013 are as fallowed:

- reliable informative action about Erasmus program among students and teachers
- promotion of the University among foreign partners
- establishing new contacts with foreign institutions at which students and teachers will have opportunity to practice and study
- improvement of university attractiveness for foreign partner institutions as well as on extension of the out-going offer
- enable students and academic teachers to improve the qualifications and benefit from international experiences, cultural recognition and various educational methodologies at universities and companies participating in the program
- initiation of the offer of course units lectured in foreign languages

Erasmus Institutional Coordinator
Ms Agata Bruska

Erasmus Officers
Ms Kamila Milewska
Ms Katarzyna Stawna
3. **Becoming an Erasmus student at West Pomeranian University of Technology, Szczecin**

If you would like to spend a semester or whole academic year at West Pomeranian University of Technology, Szczecin (Poland) in the framework of the Erasmus Program, please make sure that your home university has signed an Erasmus bilateral agreement with us. This information is usually provided by the Erasmus Coordinator at your home university. Please check also the areas of study for which the agreement is valid – generally student flows are realized within the areas specified in the agreement. However, if you are interested in courses in a study area not mentioned or included in the agreement, please send your inquiry to the Department of Educational Matters, e-mail: international@zut.edu.pl. We will try to do our best to make your stay possible.

Before you submit your application, please check the availability of courses taught in English at the faculty at West Pomeranian University of Technology. Should you have any doubts or questions, please contact our faculty coordinators.

**Candidate Erasmus students are obligated to send the following documents:**

- Application Form
- Accommodation Form
- Transcript of Records - list of courses completed at your home university prior to you departure,
- Learning Agreement - agreed upon with home and host coordinator.

**The application deadlines are as followed:**

- **30 June** – winter semester or whole academic year
- **30 November** – summer semester

**Complete applications should be sent to:**

West Pomeranian University of Technology, Szczecin  
Department of Educational Matters  
International Cooperation  
“Erasmus Program”  
al. Piastów 17, 70-310 Szczecin, POLAND

About two weeks before your arrival you will be notified about being accepted at the West Pomeranian University of Technology as an Erasmus exchange student. Also you will be informed about the address of your dormitory and contact details of your student buddy.
III. Courses

1. List of all available courses

Faculty of Biotechnology and Animal Husbandry

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Faculty of Civil Engineering and Architecture

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Civil Engineering Courses:

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#### Faculty of Computer Science and Information Technology Courses:

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#### Faculty of Chemical Engineering Courses:

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<td>4- WKSiR-09/10</td>
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<tr>
<td>5-WKSiR-09/10</td>
<td>TYPENBESCHREIBUNG UND KARTIERUNG VON WALDSTANDORTEN</td>
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<td>ANBAUTECHNOLOGIE VON GETREIDE UND SCHMETTERLINGSGSBÜTLER</td>
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<tr>
<td>7- WKSiR-09/10</td>
<td>BIOTECHNOLOGY IN AGRICULTURE</td>
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<tr>
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<td>CHARACTERIZATION OF SELECTED HORTICULTURAL CROPS</td>
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<tr>
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<td>BIOLOGICAL PROTECTION OF PATHOGENS</td>
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<tr>
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<tr>
<td>12-WKSiR-09/10</td>
<td>THE BIOMASS PRODUCTION ON ARABLE LANDS</td>
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<tr>
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**Faculty of Food Science and Fisheries**

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<td>NUTRITION IN DIFFERENT PHYSIOLOGICAL STATES</td>
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<tr>
<td>2WNoŻiR-09/10</td>
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<td>5WNoŻiR-09/10</td>
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<td>FOOD TOXICOLOGY AND ITEMS OF COMMON USE</td>
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<tr>
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<tr>
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<tr>
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<td>14WNoŻiR-09/10</td>
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### Faculty of Mechanical Engineering and Mechatronics Courses: Material Science Courses:

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<td>18-WIMIM-09/10</td>
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<td>19-WIMIM-09/10</td>
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<td>22-WIMIM-09/10</td>
<td>FUELS AND COMBUSTION TECHNOLOGIES</td>
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<td>STEAM AND GAS TURBINE</td>
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## Detailed description of courses

### 1. Course title: FUNDAMENTALS OF LABORATORY DIAGNOSTIC
2. Code: 1E-WBiHZ-09/10
3. ECTS points: 6
4. Semester: winter
5. Hours per week
6. Language: English
7. Teaching method:
8. Name of the lecturer: dr inż. Agnieszka Tomza-Marciniak
9. Course contents:
   - Complete Blood Count (CBC) test. **Automated and semi-automated blood analysis.** Method of the preparation of blood samples for analysis. Components of the complete blood count (CBC) and references values for human and animals. Interpretation of results. [2 hours]
   - The urine analysis (Reader Urine Analyser). The physico-chemical and microscopic properties of the urine. Urine sample collection and analysis. Urine sediment analysis. References values for human and animals. Interpretation of results of physico-chemical and microscopic analysis. [2 hours]
   - The qualitative and quantitative methods in parasitology. Coproscopic techniques for detection and quantitative estimation of endoparasites. Microscopic Examination. Collection and storage of stool samples. [2 hours]
   - The post-mortem parasitological examination: dissection, parasites isolation, preservation and examination of collected samples. [4 hours]
   - Trichinella detection: trichinoscopy and pooled-sample digestion method. [3 hours]
10. Assessment methods:
11. Recommended reading:

### 1. Course title: ELEMENTS OF PARASITOLOGY
2. Code: 2E-WBiHZ-09/10
3. ECTS points: 5
4. Semester: winter
5. Hours per week
6. Language: English
7. Teaching method:
8. Name of the lecturer: dr inż. Agnieszka Tomza-Marciniak
9. Course contents:
   - Parasitism as biological phenomena. Terminology. Parasites occurrence. Morphological adaptation to parasitism. [2 hour]
   - Immunological aspects of host parasite relationship. Type of immune response. Host immunity against parasites. Evasion of host immunity by parasites. [2 hours]
   - Biological properties of host-parasites relationship. Reproduction, development and life cycles. Adaptation to closing of the life cycle. [2 hours]
   - Physiology of host-parasite relationship. The course of parasite penetration. The pathological changes caused by endoparasites in host. [2 hour]
10. Assessment methods:
11. Recommended reading:

### 1. Course title: BIOLOGY OF THE HONEYBEE COLONY
2. Code: 3E-WBiHZ-09/10
3. ECTS points: 4
### HUMAN NUTRITION AND NATURAL FOOD INGREDIENTS

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### PROTEOMICS

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<td>Introduction to proteomics</td>
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<td>Genome, transcriptome, proteome. Biological significance of post-transcriptional and post-translational protein modifications. Proteome organization.</td>
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<tr>
<td><strong>Proteome analysis and proteins identification. Sample preparation</strong></td>
</tr>
<tr>
<td>The purpose of proteome analysis and proteins identification, sample preparation, cellular lysis, lysis buffers (chaotropic agents, detergents, reducing agents, amfolites), methods of sample purification, protein precipitation methods.</td>
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<tr>
<td><strong>Protein separation techniques</strong></td>
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<tr>
<td>The general principles of proteomic analysis. Basic components of polyacrylamide gels, proteins detection, methods of staining proteins.</td>
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<tr>
<td><strong>Electrophoresis – 1D</strong></td>
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<tr>
<td>One-dimensional gel electrophoresis, stacking gels, resolving gels, SDS-PAGE electrophoresis, native PAGE electrophoresis, technique of preparation and usage of mini gels.</td>
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<tr>
<td><strong>Electrophoresis – 2D</strong></td>
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<td>Rehydration significance, principles of isoelectric focusing, isoelectric point, rehydration buffers, IPG balancing strips, migration buffers, second-dimensional of 2D-SDS PAGE electrophoresis.</td>
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<td><strong>Western blotting</strong></td>
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<td>Transfer of proteins from gel to membrane. Wet transfer, semi-dry transfer. Immunodetection.</td>
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<td><strong>Mass Spectrometry (MS) application in proteomics</strong></td>
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<tr>
<td>Maldi -ToF mass spectrometry -Matrix-Assisted Laser Desorption/Ionization (MALDI), Time-of-Flight (TOF) mass spectrometry, proteolytic enzymes usage in sample preparation.</td>
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<tr>
<td><strong>Bioinformatic tools</strong></td>
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<tr>
<td><strong>Proteomics in Poland and in the World</strong></td>
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<tr>
<td>Current progress in proteomic studies in the world and their practical application. The purpose of proteomics. HUPO – Human Proteome Organization.</td>
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1. Course title: Основные исследования в области лабораторной диагностики

2. Code: 6R-WBiHZ-09/10
3. ECTS points: 4
4. Semester: winter
5. Hours per week
6. Language: Russian
7. Teaching method: 
8. Name of the lecturer: prof. dr hab. Aleksandra Balicka-Ramisz
9. Course contents:
   Цели и профиль лабораторных исследований. Виды биологического материала. Принципы правильного получения проб. Достоверность результатов. Формулировка результатов исследований.
   Использование теста ELISA (Enzyme Linked Immunosorbent Assay) в ветеринарной диагностике. Виды теста ELISA, качественные методы, количественные методы.
   Методы наблюдения выживаемости оценки паразитарного вторжения. Методы диагностики, используемые в паразитологии. Обзор методов исследования кала.
   Диагностика простейших – паразитов. Систематический анализ кокцидий из ряда Eimeria и Isospora. Ключ для обозначения простейших.
   Диагностика лейкоза и бешенства. Подведение итогов лекций.

10. Assessment methods:
11. Recommended reading:

1. Course title: ВЕТЕРНАРНАЯ ПАРАЗИТОЛОГИЯ И ПРОФИЛАКТИКА

2. Code: 7R-WBiHZ-09/10
3. ECTS points: 4
4. Semester: winter
5. Hours per week
6. Language: Russian
7. Teaching method: 
8. Name of the lecturer: prof. dr hab. Aleksandra Balicka-Ramisz
9. Course contents:
10. Assessment methods:
11. Recommended reading:

1. Course title: Рациональное питание животных

2. Code: 8R-WBiHZ-09/10
3. ECTS points: 4
4. Semester: winter
5. Hours per week
6. Language: Russian
7. Teaching method: 
8. Name of the lecturer: dr inż. Kazimierz Bobko
9. Course contents:
   Питая как основной фактор среды и его влияние на производственность животных. Деление кормов и факторы влияющие на их пищевую ценность. Характеристика компонентов пищевых кормов. Характеристика отдельных групп кормов содержательных и объёмных и их часть в пищевых дозах. Специфика питания свиней.
   Укладывание норм и кормовых рационов для свиней по NZŚ. Укладывание норм и кормовых рационов для коров по немецкой системе DLG. Укладывание норм и кормовых рационов для коров по французком системе INRA.

10. Assessment methods:
11. Recommended reading:

1. Course title: BIOTECHNIK DER FORTPFLANZUNG DER TIERE

2. Code: 9G-WBiHZ-09/10
3. ECTS points: 6
4. Semester: winter
5. Hours per week
6. Language: German
7. Teaching method: 
8. Name of the lecturer: dr hab. Bogdan Lasota, prof. nadzw. ZUT
9. Course contents:
   Der Gegenstand des Kurses ist die Anwendung von biotechnischen Methoden bei der Reproduktion

10. Assessment methods:
11. Recommended reading:

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<td>6. Language: German</td>
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<td>7. Teaching method:</td>
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<td>8. Name of the lecturer: mgr. inż. Jerzy Samborki</td>
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<tbody>
<tr>
<td>2. Code: 11G-W- WBiHZ-09/10</td>
</tr>
<tr>
<td>3. ECTS points: 6</td>
</tr>
<tr>
<td>4. Semester: winter</td>
</tr>
<tr>
<td>5. Hours: 10 T</td>
</tr>
<tr>
<td>6. Language: German</td>
</tr>
<tr>
<td>7. Teaching method: Teil</td>
</tr>
<tr>
<td>8. Name of the lecturer: prof. dr hab. Wiesław Skrzypczak</td>
</tr>
<tr>
<td>9. Course contents:</td>
</tr>
<tr>
<td>I. Humorale und nervöse Regulation</td>
</tr>
<tr>
<td>Regulation der Hormonsekretion, die Hypophyse, die Schilddrüse, die Nebenschilddrüsen, das Inselorganen des Pankreas, die Nebennieren, die Keimdrüsen, die Gewebshormone. Funktion des Nervensystems. Membranpotential. Synapsen. Reflexe.</td>
</tr>
<tr>
<td>Teil II. Die Physiologie der Verdauungstrakt</td>
</tr>
<tr>
<td>Teil III. Die Physiologie der Ernährung: Mineralstoffe, Spurenelemente und Vitamine</td>
</tr>
<tr>
<td>Natrium, Kalium, Chlorid, Kalzium, Magnesium, Eisen, Jod,</td>
</tr>
<tr>
<td>Teil IV. Das Blut</td>
</tr>
<tr>
<td>Die allgemeine Bedeutung des Blutes, die Blutzellen, die Blutgerinnung.</td>
</tr>
<tr>
<td>Teil V. Das Herz</td>
</tr>
<tr>
<td>Allgemeine Eigenschaften des Herz Muskels, die phasen der Herztätigkeit, der Blutdruck im Herz, die nervale Beeinflussung der Herzfunktion.</td>
</tr>
<tr>
<td>Teil VI. Der Blutkreislauf</td>
</tr>
<tr>
<td>Die funktion: der Arterien, der Kapillaren und der Venen, die regulation der Kreislaufs, das lymphatishe System.</td>
</tr>
<tr>
<td>Teil VII. Physiologie der Atmung</td>
</tr>
<tr>
<td>Funktion der Lungen, die mechanik der Lungenatmung, der Transprot des Sauerstoffs und der Kohlensaure im Blut, die Steuerung der Atmung.</td>
</tr>
<tr>
<td>Teil VIII. Die Physiologie der Niere (I)</td>
</tr>
<tr>
<td>Bau der Niere, allgemeine Aufgaben der Niere, die Durchblutung der Niere, die Funktion des Nephrons, die Ausscheidung des Wassers, der Elektrolyte und Nichtelektrolyte.</td>
</tr>
<tr>
<td>Teil IX. Die Physiologie der Niere (II)</td>
</tr>
<tr>
<td>Der Wasserhaushalt, Saure-Basen-Haushalt und Niere, die nervalen und hormonalen Einflüsse auf die Nierenfunktion.</td>
</tr>
<tr>
<td>Teil X. Die Physiologie der Thermoregulation</td>
</tr>
<tr>
<td>Die regulation der Warmbildung und Warmabgabe, Temperaturregulationszentrum, die Hypothermie, die Hyperthermie und das Fiber.</td>
</tr>
<tr>
<td>10. Assessment methods:</td>
</tr>
<tr>
<td>11. Recommended reading:</td>
</tr>
</tbody>
</table>
**SUMMER SEMESTER**

### Protomika
- **Course title:** PROTOMIKA
- **Code:** 12F-W- WBiHZ-09/10
- **ECTS points:** 6
- **Semester:** winter
- **Language:** French
- **Teaching method:**
- **Name of the lecturer:** dr inż. Małgorzata Ożgo
- **Course contents:**
- **Assessment methods:**
- **Recommended reading:**

### Beekeeping in the Past and Presents
- **Course title:** BEEKEEPING IN THE PAST AND PRESENTS
- **Code:** 1E-S- WBiHZ-09/10
- **ECTS points:** 4
- **Semester:** summer
- **Language:** English
- **Teaching method:**
- **Name of the lecturer:** mgr. inż. Piotr Rostecki
- **Course contents:**
- **Assessment methods:**
- **Recommended reading:**

### Biotechnology and Genetic Engineering
- **Course title:** BIOTECHNOLOGY AND GENETIC ENGINEERING
- **Code:** 2E-S- WBiHZ-09/10
- **ECTS points:** 6
- **Semester:** summer
- **Hours:** 30
- **Language:** English
- **Teaching method:**
- **Name of the lecturer:** dr inż. Arkadiusz Terman
- **Course contents:**
  - The course discusses current knowledge about the generic engineering in biotechnology and molecular mechanisms. The course include: genomic DNA isolation, RNA isolation, primers digestion, PCR analysis, use of RFLP, AFLP, RAPD and RT-PCR methods, restriction enzymes analysis, agarose gel electrophoresis, gene expression analysis, practical use of different software for genomes analysis.
- **Assessment methods:**
- **Recommended reading:**

### Genetic and Genomic
- **Course title:** GENETIC AND GENOMIC
- **Code:** 3E-S- WBiHZ-09/10
- **ECTS points:** 6
- **Semester:** summer
- **Language:** English
- **Teaching method:**
- **Name of the lecturer:** dr inż. Arkadiusz Terman
- **Course contents:**
- **Assessment methods:**
- **Recommended reading:**

### Körung der Biene
- **Course title:** KORUNG DER BIENEN
- **Code:** 4G-S- WBiHZ-09/10
- **ECTS points:** 4
- **Semester:** summer
- **Language:** German
- **Teaching method:**
- **Name of the lecturer:** mgr. inż. Jerzy Samborki
- **Course contents:**
- **Assessment methods:**
- **Recommended reading:**
# Architecture and Urban Courses:

## WINTER SEMESTER

<table>
<thead>
<tr>
<th>Course title: ARCHITECTURAL DESIGN 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Code: AIU/MGR/B2</td>
</tr>
<tr>
<td>3. ECTS points: 3</td>
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<td>4. Semester: winter</td>
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<tr>
<td>5. Hours: 60 DS</td>
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<tr>
<td>6. Language: English</td>
</tr>
<tr>
<td>7. Teaching method:</td>
</tr>
<tr>
<td>9. Course contents:</td>
</tr>
<tr>
<td>Gaining knowledge about design mechanisms and processes, mastering a skill of variant modeling of processes and simulation in the created architectural space.</td>
</tr>
<tr>
<td>Design studio programme:</td>
</tr>
<tr>
<td>Choice of the subject of small scale and range of description, an analysis of potential possibilities of design solution, an analysis of critical points, research on function variability and mobility, material solutions, an analysis of building structures in the context of the life cycle and ecological profile for the accepted solutions.</td>
</tr>
<tr>
<td>10. Assessment methods:</td>
</tr>
<tr>
<td>Completing of term project (A3 format, min. 4 large -scale illustrations and digital version on CD, saved in PDF extension) and a project book, containing drafts regarding project, inspirations and resources, presenting development of the work during the project exercises.</td>
</tr>
<tr>
<td>11. Recommended reading:</td>
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</table>

<table>
<thead>
<tr>
<th>Course title: ARCHITECTURAL DESIGN 2</th>
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<tbody>
<tr>
<td>2. Code: AIU/MGR/B3</td>
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<tr>
<td>3. ECTS points: 4</td>
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<tr>
<td>4. Semester: winter</td>
</tr>
<tr>
<td>5. Hours: 45 DS</td>
</tr>
<tr>
<td>6. Language: English</td>
</tr>
<tr>
<td>7. Teaching method:</td>
</tr>
<tr>
<td>9. Course contents:</td>
</tr>
<tr>
<td>The aim of the subject is to introduce the environmentally responsible design, in particular the energy conservation of the public use and domestic architecture that complies with the Energy Performance of Buildings Directive.</td>
</tr>
<tr>
<td>Design studio programme:</td>
</tr>
<tr>
<td>- presentation of the rules that apply to the preparation of a building energy rating that complies with the Energy Performance of Buildings Directive and its derivations;</td>
</tr>
<tr>
<td>- design project of a public use building with a simple programme;</td>
</tr>
<tr>
<td>- optional spatial solutions performed as simulations in order to expose the differences in energy consumption;</td>
</tr>
<tr>
<td>- seeking for an optimal solution compromising the aesthetics, function and energy performance of a building;</td>
</tr>
<tr>
<td>- preparation of a simplified version of the building energy rating.</td>
</tr>
<tr>
<td>10. Assessment methods:</td>
</tr>
<tr>
<td>A pass result for the design studio is based on the submission of a completed project meeting the below given requirements (material for submission).</td>
</tr>
<tr>
<td>After passing the subject a pass result is written down into the student’s matriculate.</td>
</tr>
<tr>
<td>11. Recommended reading:</td>
</tr>
</tbody>
</table>
### 1. Course title: **ARCHITECTONIC AND URBAN MODELING**

<table>
<thead>
<tr>
<th>2. Code: WBiA/ AiU/MGR/A5</th>
<th>3. ECTS points: 1</th>
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</thead>
<tbody>
<tr>
<td>6. Language: English</td>
<td>7. Teaching method:</td>
</tr>
</tbody>
</table>

9. **Course contents:**
   - Discussion of individual computer program used at modeling
     - ArchiCAD
     - Revit Architecture
     - Autodesk 3ds max
   - Analysis of difference in schemes of creation of three-dimensional individual models of programs.
   - Execution of three-dimensional (spatial) model on chosen program

10. **Assessment methods:**
    - Laboratory studies in groups at use of computer, 8 personal max, multimedia presentations, exercises at use of chosen unit for modeling individual program.
    - Form of crediting a subject (scope of elaboration): Preparation chosen three-dimensional model at use one of acquainted program in the form of multimedia presentation include renderings and animations.

11. **Results of study-knowledge and competences:**
    - Basic abilities in use at architectonic and urban modeling software

### 1. Course title: **COMPUTER DESIGN CAD**

<table>
<thead>
<tr>
<th>2. Code: AiU/MGR/A4</th>
<th>3. ECTS points: 1</th>
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</thead>
<tbody>
<tr>
<td>6. Language: English</td>
<td>7. Teaching method:</td>
</tr>
</tbody>
</table>

9. **Course contents:**
   - Analysis of basic scheme of operation in CAD programs
   - Discussion of main common unit program for CAD programs
   - Discussion of individual CAD programs
     - ArchiCAD
     - AutoCAD
     - Revit Architecture
     - Allplan Nemetschek
     - ArCon
     - Arkadia-Architektura
   - Execution of analysis of capability of learned comparative programs in the course of individual phases of project designs

10. **Assessment methods:**
    - Laboratory studies in groups at use of computer, 8 personal max, multimedia presentations, exercises at use of chosen tools of learning programs, preparation by students shorts presentations of CAD programs not included by main program studies.
    - Form of crediting a subject (scope of elaboration): Preparation a multimedia presentation of CAD programs not included by main program studies, preparation an analysis of capability of presented comparative CAD programs included main studies, systematizing of defect and above-mentioned advantages.

11. **Results of study-knowledge and competences:**
    - Familiarization with leading computer program helps CAD.

### 1. Course title: **HISTORY OF THE CONTEMPORARY ARCHITECTURE AND URBAN PLANNING**

<table>
<thead>
<tr>
<th>2. Code: AiU/MGR/B7</th>
<th>3. ECTS points: 1</th>
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</thead>
<tbody>
<tr>
<td>6. Language: English</td>
<td>7. Teaching method:</td>
</tr>
<tr>
<td>8. Name of the lecturer: Olga Sietnicka, Ph.D. Eng. Arch</td>
<td></td>
</tr>
</tbody>
</table>

24
9. Course contents:
The history of the development of the theory and critics of the contemporary architecture based on the selected examples from the field of the architecture and urban planning of the 20\textsuperscript{th} and 21\textsuperscript{st} century, especially the avant-garde architecture, starting with the Modern Movement through the Post-Modernism and the Poststructuralism to the Architecture of the Information; the culture context of the contemporary architectural thought, with a special impact on contemporary philosophy and the recent aesthetic environmental theories.

10. Assessment methods:
The detailed analysis of the selected principal writings on theory and critics of the contemporary architecture and urban planning; the comparative analysis of writings wrote by designers, critics and art historians; the analysis of fundamental writings on culture wrote by the key philosophers and cultural theorists; case studies; the debate (presentation and critique of the selected architectural objects or of the results of exercises in design) with the practical use of the selected languages of the contemporary architectural theory (applying the distinctive terminology).

Form of crediting a subject (scope of elaboration): The written thesis on the given subject (from the field of the theory and critics of the contemporary architecture and urban planning).

11. Results of study-knowledge and competences:
The purpose is to complete the knowledge from the field of the history of the contemporary architecture and urban planning by appending the basic facts from the domain of the architectural theory and critics, to link the history of the contemporary architecture and urban planning to the keynotes of present philosophy, sociology etc.; to enrich the professional language, to improve the skill of architectural discourse.

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1. Course title: **SPECIALISTIC ARCHITECTURAL DESIGN**

2. Code: AiU/MGR/B8.2
3. ECTS points: 10
4. Semester: winter
5. Hours: DS-45
6. Language: English
7. Teaching method:

9. Course contents:
Gaining knowledge about design buildings on a middle scale (maximum 5 000 m\textsuperscript{2}) and complex function contained formal and functional aspects of designing process, including problems of context, structure, building materials and technologies. Mastering skills of modelling and 3D simulation.

Subject matter concerns buildings dedicated to specialist function: education (nursery school, primary school, university), penitence (penal institute, borstal), healthcare (health centres: hospital, community health centre, health resort, rehabilitation centre, spa), sport and recreation.

Design studio programme:
Choice of the subject and location, formulating of the functional programme, an analysis of location requirements, an analysis of functional solution, an analysis of form and structure, research on function variability and mobility, material solutions, an analysis of solutions in the context ecological profile.

10. Assessment methods:
Completing of term project (A2 format for presentation board, A3/A4 format for drawings (situation, floor views, sections, elevations) and illustrations. Digital version on CD, saved in PDF extension. Project book, containing drafts regarding project, inspirations and resources, presenting development of the work during the project exercises.

11. Recommended reading:

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1. Course title: **PUBLIC ARCHITECTURAL DESIGN**

2. Code: AiU/MGR/B8.2
3. ECTS points: 10
4. Semester: winter
5. Hours: DS-45
6. Language: English
7. Teaching method:

9. Course contents:
Analyses of needs and ambitions of design participants, defining design principles, site valorization, methodological and typological questions, defining of site program, distribution of program on site,
11. Assessment methods:
Workshops, brainstorming, discourse; one to one conversations, desk studies, students presentations, 3D modeling, CAD.

Form of crediting a subject (scope of elaboration): Obligatory participation in workshops, one to one conversations, student’s presentations. Execution of final design with diagrams, plans, sections, visualizations - preliminary (concept) design with elements of construction (building permit) and detailed design.

11. Results of study-knowledge and competences:
Study and practical application of methodologies and design basics of public utility architecture, passing through phases of design, introduction to complexity and interrelationships of different issues contributed to design of public architecture.

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### SUMMER SEMESTER

1. Course title: ARCHITECTURAL DESIGN 1 (SUSTAINABLE DESIGN)

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>4. Semester: summer</td>
<td>5. Hours per week: 45 DS</td>
</tr>
<tr>
<td>6. Language: English</td>
<td>7. Teaching method:</td>
</tr>
</tbody>
</table>

9. Course contents:
The aim of the subject is to create an architectural space with consideration of the important ecological factors, in particular the energy conservation, and to introduce the sustainable design, where environmental sensitivity is the key paradigm for design strategies.

The main topic of the design studio is the design of public buildings utilising pro-environmental strategies that inform the architectural form.

Students are to design architectural spaces on the given sites where the pro-environmental solutions are integral with the formal and technical elements.

10. Assessment methods:
A pass result for the design studio is based on 2 components: a mark for the design assignments (35%) and a mark for the general semester project (65%). The finished semester project should present both a solution for the design problem and the student’s technical and artistic skills.

11. Recommended reading:

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1. Course title: LANDSCAPE DESIGNING

<table>
<thead>
<tr>
<th>2. Code: AiU/MGR/B6</th>
<th>3. ECTS points: 2</th>
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</thead>
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<tr>
<td>4. Semester: summer</td>
<td>5. Hours per week:</td>
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<tr>
<td>6. Language: English</td>
<td>7. Teaching method:</td>
</tr>
<tr>
<td>8. Name of the lecturer: Magdalena Rzeszotarska – Palka, Ph.D. Eng. Arch</td>
<td></td>
</tr>
</tbody>
</table>

9. Course contents:

10. Assessment methods:
- theory of architectural and landscape interiors in practice (recognition and evaluation of main elements of existing public spaces in the city) – field work
- an analysis of cultural values of a landscape and evaluation of the chosen set of landscape interiors
- working on overall design of site plan of the set of landscape interiors
- working on detailed design of the chosen landscape interior
- designs of small architecture
- detailed plant selection
Form of crediting a subject (scope of elaboration): Credit for a course on the basis of realized design of the set of architectural – landscape interiors with attached description of used materials and plants as well as landscape analysis.

11. Results of study-knowledge and competences:
The main aim of the subject is to acquaint students with basic skills in the field of landscape evaluation and designing of natural and artificial elements as elements of preserving and bringing up aesthetical values of open spaces and public spaces in the city and in the village. Recognition with creating of spatial disposition plans with focus on landscape forming and preserving criteria.

1. Course title: **SPECIALISTIC ARCHITECTURAL DESIGN**

<table>
<thead>
<tr>
<th>2. Code: AiU/MGR/B8.2</th>
<th>3. ECTS points: 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Language: English</td>
<td>7. Teaching method:</td>
</tr>
</tbody>
</table>

9. Course contents:
Gaining knowledge about design buildings on a middle scale (maximum 5 000 m²) and complex function contained formal and functional aspects of designing process, including problems of context, structure, building materials and technologies. Mastering skills of modelling and 3D simulation.
Subject matter concerns buildings dedicated to specialist function: education (nursery school, primary school, university), penitence (penal institute, borstal), healthcare (health centres: hospital, community health centre, health resort, rehabilitation centre, spa), sport and recreation.
Design studio programme:
Choice of the subject and location, formulating of the functional programme, an analysis of location requirements, an analysis of functional solution, an analysis of form and structure, research on function variability and mobility, material solutions, an analysis of solutions in the context ecological profile.

10. Assessment methods:
Completing of term project (A2 format for presentation board, A3/A4 format for drawings (situation, floor views, sections, elevations) and illustrations. Digital version on CD, saved in PDF extension. Project book, containing drafts regarding project, inspirations and resources, presenting development of the work during the project exercises.

11. Recommended reading:

1. Course title: **PUBLIC ARCHITECTURAL DESIGN**

<table>
<thead>
<tr>
<th>2. Code: AiU/MGR/B8.3</th>
<th>3. ECTS points: 10</th>
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</thead>
<tbody>
<tr>
<td>6. Language: English</td>
<td>7. Teaching method:</td>
</tr>
</tbody>
</table>

9. Course contents:
Gaining knowledge about design a public buildings on a large scale (over 10 000 m²) and complex function contained formal and functional aspects of designing process, including problems of context, structure, building materials and technologies. Mastering skills of modelling and 3D simulation.
Subject matter concerns public buildings dedicated to function: culture (theatre, cinema, concert hall, museum, library, and art centre), religion (temple, church, monastery, religious and culture centre), commerce (shopping centre, shopping arcade), residence (hotel, boarding house).

10. Assessment methods:
Completing of term project (A2 format for presentation board, A3/A4 format for drawings (situation, floor views, sections, elevations) and illustrations. Digital version on CD, saved in PDF extension. Project book, containing drafts regarding project, inspirations and resources, presenting development of the work during the project exercises.

11. Recommended reading:

1. Course title: **PRE-DIPLOMA DESIGN**

| 2. Code: AiU/MGR/C1 | 3. ECTS points: 2 |
4. Semester: summer  
5. Hours: 15:  
6. Language: English  
7. Teaching method:  
8. Name of the lecturer: Miłosz Raczyński, Ph.D. Eng. Arch  
9. Course contents: 
Introduction of necessary materials, carrying out analyses and determining initial design principles necessary for the execution of diploma design. Site inspection and collection of necessary materials (base maps, photo documentation). Analysis of the place context and determination of spatial relations in particular surrounding, computer and mock-up modeling. Seeking inspirations and determining initial design principles.

10. Assessment methods: 
Form of crediting a subject (scope of elaboration): Submission of the design in A4 folders together with a mock-up or 3D model of analyzed location in digital format.

11. Results of study-knowledge and competences: 
Preparation of necessary materials, carrying out analyses and determining initial design principles necessary for the execution of diploma design.

Civil Engineering Courses:

**WINTER SEMESTER**

<table>
<thead>
<tr>
<th>1. Course title</th>
<th>CONSTRUCTION ECONOMICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Code: B/S1/OiZ/-/37</td>
<td>3. ECTS points: 3</td>
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<tr>
<td>4. Semester: winter</td>
<td>5. Hours: L-15, Cl.-15</td>
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<tr>
<td>6. Language: English</td>
<td>7. Teaching method:</td>
</tr>
<tr>
<td>8. Name of the lecturer: mgr A. Siewiera</td>
<td></td>
</tr>
</tbody>
</table>

9. Course contents: 

10. Assessment methods: 
Tutorial cases of costs and profit calculation- BEP analysis, Marketing results in respect to competitiveness researches. Market analysis of similar projects due to comparison of fixed costs. Prices analysis of sales or rent of Project.

11. Recommended reading:

<table>
<thead>
<tr>
<th>1. Course title: PROJECT MANAGEMENT 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Code: B/S1/OiZ/-/39-1</td>
</tr>
<tr>
<td>4. Semester: winter</td>
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<tr>
<td>6. Language: English</td>
</tr>
<tr>
<td>8. Name of the lecturer: mgr inż. Krzysztof Tracz</td>
</tr>
</tbody>
</table>

9. Course contents: 
Project definition, Project life cycle, Project management elements, Project selection model, Project management methodologies (classic, PMBOK, PRINCE 2), SWOT analysis, Basic elements of strategy planning, portfolio management, process integration, Basic duties of Project manager, work breakdown structure (WBS)

10. Assessment methods: 
Case study:
- SWOT analysis
- selection of the model
- strategy of project

11. Recommended reading:
- Project Management Institute "A guide to the Project Management Body of Knowledge", 2000
### Course title: CONSTRUCTION SITE MANAGEMENT I

<table>
<thead>
<tr>
<th>2. Code: B/S1/OiZ/-/45</th>
<th>3. ECTS points: 5</th>
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<tr>
<td>4. Semester: winter</td>
<td>5. Hours: L-30, Cl.-30</td>
</tr>
<tr>
<td>6. Language: English</td>
<td>7. Teaching method:</td>
</tr>
</tbody>
</table>

8. Name of the lecturer: mgr inż. Krzysztof Tracz

9. Course contents:
   - Basic models of construction company organization, scope of duties and responsibilities of key staff in construction company, basic standards of leadership, requirements to the site/project manager position,
   - Human resources planning, procedures of site mobilization, Planning of site infrastructure, plan BiOZ, planning of optimal technology of the works, legal aspects of works commencement.

10. Assessment methods:
    - organizational chart of construction company,
    - post description of project supervising staff,
    - preliminary manpower histogram of contract works,
    - handing-over protocol of site place,
    - planning of temporary site facilities,
    - method statements for different projects,

11. Recommended reading:
    - Rory Burke „ Project management – planning and control” - John Wiley &Sons, 1993
    - A guide to the Project Management body of knowledge – PMI standards committee 2000,
    - National competence baseline (NCB) Version 1.2 – International Project management association

### Course title: CONTRACT PROCEDURES

<table>
<thead>
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<th>2. Code: B/S1/OiZ/-/46</th>
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<tbody>
<tr>
<td>6. Language: English</td>
<td>7. Teaching method:</td>
</tr>
</tbody>
</table>

8. Name of the lecturer: mgr inż. Krzysztof Tracz

9. Course contents:
   - Basic definitions of the contract, specifics of construction contracting in respect to private and public sector, types of construction contracts by private employers, optimization of contract risks in selection of contract type, the principles of contract negotiations, basics of tender specification for private contracts – SIWZ elements, selection procedure of the best tender.

10. Assessment methods:
    - analysis of optimal type of the contract for indicated project of private sector,
    - tender specification of the project as above,
    - basic principles of general condition of contract,
    - description of scope of works and the bill of quantities,

11. Recommended reading:
    - Seeley Ivor, Quantity surveying practice, MacMillan Education Ltd. 1991,
    - Jenkins Robert, Construction contracts, 1998
    - JCT works-1998

### Course title: QUALITY MANAGEMENT SYSTEMS

<table>
<thead>
<tr>
<th>2. Code: B/S1/OiZ/-/47</th>
<th>3. ECTS points: 4</th>
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<tbody>
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<td>4. Semester: winter</td>
<td>5. Hours: L-30, Cl.-30</td>
</tr>
<tr>
<td>6. Language: English</td>
<td>7. Teaching method:</td>
</tr>
</tbody>
</table>

8. Name of the lecturer: mgr inż. Krzysztof Tracz

9. Course contents:
   - History and evolution of quality idea, the scope and basics of description of quality norms, the basic meanings and structure of norms series ISO 9000, process approach and its interpretation for construction companies, basic tools of quality management – Fishbone diagram, Pareto Analysis, TQM, quality costs, documentation structure of QMS, the requirements of norm ISO 9001: 2000 in respect to construction activities,

10. Assessment methods:
- working out of *Quality Policy* for construction company,
- working out of *Quality Plane* for indicated construction work
- working out of *Quality Procedure* for indicated of the norm ISO 9001,

11. Recommended reading:
- Flood Robert L., Beyond TQM, John Wiley & Sons, 1994

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### FINANCE AND ACCOUNTANCY I

1. Course title: **FINANCE AND ACCOUNTANCY I**
2. Code: B/S1/OiZ/-/48
3. ECTS points: 5
4. Semester: winter
5. Hours: L-15, P-15
6. Language: English
7. Teaching method:
8. Name of the lecturer: dr Małgorzata Góralczyńska – Koczkodaj
9. Course contents:
   - Basic financial concepts, definitions and functions of financing, scope of financing, central bank influence on money supply on the market, National bank supervision, services and products of commercial banks, types and classifying of bank loans, legal protection of the loans, costs and structure of company capital, costs of capital.
10. Assessment methods:
    - Equity and liability management, calculation of money value in time, management of amount due-cash- liabilities, flow analysis, operational and financial lever, calculation of taxes.
11. Recommended reading:

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### ANALYSIS OF PROJECT EFFICIENCY

1. Course title: **ANALYSIS OF PROJECT EFFICIENCY**
2. Code: B/S1/OiZ/-/49
3. ECTS points: 5
4. Semester: winter
5. Hours: L-30, Cl.-30
6. Language: English
7. Teaching method:
8. Name of the lecturer: mgr A. Siewiera
9. Course contents:
10. Assessment methods:
    - Analysis of internal and external sources of financing. Loan costs and repayment – financial schedule. SWOT analysis, identification of the risk - matrix, project CASH FLOW. Efficiency analysis – static and dynamic methods, K/K analysis.
11. Recommended reading:

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### ENVIRONMENTAL GEOTECHNOLOGY

1. Course title: **ENVIRONMENTAL GEOTECHNOLOGY**
2. Code: B/S1/OiZ/-/50
3. ECTS points: 3
4. Semester: winter
5. Hours: L-15, P-15
6. Language: English
7. Teaching method:
8. Name of the lecturer: dr inż. Andrzej Pozlewicz
9. Course contents:
   - Geotechnics and the environment, Environmental basics, Soil investigation for environmental purposes, Landfill sitting and site investigation, Seepage and groundwater control, waste disposal by landfill, clay liners, Geomembranes and composite liners, Contaminated land, Waste materials in geotechnical construction, Soil-waste interactions, Groundwater lowering in construction, Land subsidence caused by human activities, Slurry walls.
10. Assignment:
    - Basic design of a landfill for given geological data with respect to soil-waste interaction.
11. Recommended reading:

### Course title: HYDROGEOLOGY

<table>
<thead>
<tr>
<th>2. Code: B/S1/OiZ/-/51</th>
<th>3. ECTS points: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Language: English</td>
<td>7. Teaching method:</td>
</tr>
</tbody>
</table>

8. Name of the lecturer: dr Leszek Kaszubowski

9. Course contents:

10. Assignment:

11. Recommended reading:

### Course title: POLISH LANGUAGE AND CULTURE

<table>
<thead>
<tr>
<th>2. Code: B/S1/OiZ/-/67</th>
<th>3. ECTS points: 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Semester: winter or summer</td>
<td>5. Hours: Lab. 60</td>
</tr>
<tr>
<td>6. Language: English/ Polish</td>
<td>7. Teaching method:</td>
</tr>
</tbody>
</table>

8. Name of the lecturer: Krzysztof Potyrała (MA); Diana Paciorek (MA)

9. Course contents:
   - Simple orders, requests, offers.
   - Personal data.
   - Simple messages (e.g. SMS, e-mail).
   - Introducing people.
   - Free time, interests.
   - At the station, in a shop, etc.
   - Describing people and places.
   - Greetings.
   - Asking directions.
   - Phone calls.
   - Describing pictures.
   - Taking notes.
   - Retelling events.
   - TV and radio news.
   - Polish customs and traditions.
**SUMMER SEMESTER**

<table>
<thead>
<tr>
<th>Course title: NEW GENERATION OF CONCRETE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code: B/S1/OiZ/-/52</td>
</tr>
<tr>
<td>ECTS points: 3</td>
</tr>
<tr>
<td>Semester: summer</td>
</tr>
<tr>
<td>Hours: L-15, Lab-15</td>
</tr>
<tr>
<td>Language: English</td>
</tr>
<tr>
<td>Teaching method:</td>
</tr>
</tbody>
</table>

8. Name of the lecturer: dr inż. Maria Kaszyńska

9. Course contents:
   - High-performance concrete principles
   - Properties of high-performance concrete
   - Effect of mineral additions and chemical admixtures on concrete properties
   - Self-compacting concrete
   - Lightweight high-performance concrete
   - Fibre-reinforced-high-performance concrete
   - Ultra high-strength cement-based materials

10. Assignment:
    - Mix design of HPC and SCC concrete. Investigation of workability properties of SCC: slump-flow test, V-funnel test, L-box test, J-ring test

11. Recommended reading:
    - Nevill A.N. Properties of concrete, 2002

<table>
<thead>
<tr>
<th>Course title: DURABILITY OF CONCRETE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code: B/S1/OiZ/-/53</td>
</tr>
<tr>
<td>ECTS points: 3</td>
</tr>
<tr>
<td>Semester: summer</td>
</tr>
<tr>
<td>Hours: L-15, Lab.-15</td>
</tr>
<tr>
<td>Language: English</td>
</tr>
<tr>
<td>Teaching method:</td>
</tr>
</tbody>
</table>

8. Name of the lecturer: dr inż. Maria Kaszyńska

9. Course contents:
   - Durability of concrete according to the code EN-PN 206-1.2003 Concrete.
   - Permeability of concrete.
   - Resistance to various forms of chemical attack.
   - Cracking in Concrete.
   - Repair and Maintenance of Concrete.
   - Freezing and thawing resistance.
   - Resistance to carbonation.
   - Resistance to sea water.
   - Alkali-aggregate reaction.
   - Abrasion resistance.
   - Corrosion of reinforcing steel.
   - Resistance to fire.

10. Assignment:
    - Mix design of concrete. Investigation of permeability, workability and mechanical properties of concrete.

11. Recommended reading:
    - Nevill A.N. Properties of concrete, 2002
### TECHNOLOGY OF STEEL STRUCTURES

<table>
<thead>
<tr>
<th>1. Course title: TECHNOLOGY OF STEEL STRUCTURES</th>
</tr>
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<tbody>
<tr>
<td>2. Code: B/S1/OiZ/-/54</td>
</tr>
<tr>
<td>6. Language: English</td>
</tr>
<tr>
<td>8. Name of the lecturer: dr inż. Wiesław Paczkowski</td>
</tr>
<tr>
<td>9. Course contents:</td>
</tr>
<tr>
<td>Introduction to steel’s role in construction industry: mild steel as a backbone of the industry, the world steel production, costs of construction works and steelwork costs, European system of steel grades notation. Steel storage tanks: classification, roofs, basic rules of shell design, bottom design, technology of execution. Welding of structural steelwork: welding process and consumables, typical weld details, weld defects and quality control. Fabrication: form of contract and organization. Erection: design for erection.</td>
</tr>
<tr>
<td>10. Assignment:</td>
</tr>
<tr>
<td>1. Contents of the design:</td>
</tr>
<tr>
<td>2. Concise description of the tank itself and its corrosion and fire protection.</td>
</tr>
<tr>
<td>3. General description of building site and erection of the tank with emphasis on technological aspects of fabrication and erection</td>
</tr>
<tr>
<td>4. Structural analysis: shell, bottom, truss girder and purloins, overall tank stability</td>
</tr>
<tr>
<td>5. Drawings:</td>
</tr>
<tr>
<td>- Vertical cross-section/outer view of the tank- 1:100;</td>
</tr>
<tr>
<td>- Plan of the bottom/roof –1:100;</td>
</tr>
<tr>
<td>- Truss girder with purlins-1:20.</td>
</tr>
<tr>
<td>6. Bill of materials</td>
</tr>
<tr>
<td>11. Recommended reading:</td>
</tr>
</tbody>
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### INDUSTRIAL STEEL STRUCTURES

<table>
<thead>
<tr>
<th>1. Course title: INDUSTRIAL STEEL STRUCTURES</th>
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<tbody>
<tr>
<td>2. Code: B/S1/OiZ/-/55</td>
</tr>
<tr>
<td>6. Language: English</td>
</tr>
<tr>
<td>8. Name of the lecturer: dr inż. Wiesław Paczkowski</td>
</tr>
<tr>
<td>9. Course contents:</td>
</tr>
<tr>
<td>10. Assignment:</td>
</tr>
<tr>
<td>Contents of the design:</td>
</tr>
<tr>
<td>1) Concise description of the tank itself and its corrosion and fire protection.</td>
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<tr>
<td>2) General description of building site and erection of the tank with emphasis on technological aspects of fabrication and erection</td>
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<tr>
<td>3) Structural analysis: shell, bottom, truss girder and purloins, overall tank stability</td>
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<tr>
<td>4) Drawings:</td>
</tr>
<tr>
<td>- Vertical cross-section/outer view of the tank- 1:100;</td>
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<tr>
<td>- Plan of the bottom/roof –1:100;</td>
</tr>
<tr>
<td>- Truss girder with purlins-1:20.</td>
</tr>
<tr>
<td>5) Bill of materials</td>
</tr>
<tr>
<td>11. Recommended reading:</td>
</tr>
</tbody>
</table>
### TECHNOLOGY OF FOUNDATION WORKS

1. **Course title:** TECHNOLOGY OF FOUNDATION WORKS
2. **Code:** B/S1/OiZ/-/56
3. **ECTS points:** 3
4. **Semester:** summer
5. **Hours:** L-15, P-15
6. **Language:** English
7. **Teaching method:**
8. **Name of the lecturer:** dr inż. Andrzej Pozlewicz
9. **Course contents:**
   - Spread foundation technology, Raft foundations, Deep shaft foundations, Foundations construction, site preparation, Excavation methods, trench excavation, support of excavations, anchoring systems technology, Sheet piling technology, Grouting technology, Groundwater lowering in construction, Slurry walls technology.
10. **Assignment:**
    - Basic design of an excavation pit with design of support with sheet walls technology.
11. **Recommended reading:**
    - Venkatramaiah C.: Geotechnical Engineering, Jon Wiley & Sons, 1993
    - Eurocode 7

### GEOENGINEERING

1. **Course title:** GEOENGINEERING
2. **Code:** B/S1/OiZ/-/57
3. **ECTS points:** 3
4. **Semester:** summer
5. **Hours:** L-15, P-15
6. **Language:** English
7. **Teaching method:**
8. **Name of the lecturer:** dr inż. Andrzej Pozlewicz
9. **Course contents:**
   - Soil improvement technologies, purpose and methods for different soil and water conditions, Methods of modification of subsoil, Soil densification, Shallow and deep soil exchange, Soils consolidation methods, Major problems in compacted fill technology, Fills and Fill Compaction, Soil reinforcement technologies, Anchoring systems technology, Sheet piling Technology, Grounding technology, Groundwater lowering in construction, Slurry walls technology, Slope stability improvement methods.
10. **Assignment:**
    - Basic design of subsoil modification with slope stability analysis.
11. **Recommended reading:**
    - Venkatramaiah C.: Geotechnical Engineering, Jon Wiley & Sons, 1993
    - Eurocode 7
**Course title:** TECHNOLOGY OF REGULATION WORKS

- **Code:** B/S1/OiZ/-/58
- **ECTS points:** 3
- **Semester:** summer
- **Hours:** L-15, P-15
- **Language:** English
- **Teaching method:**
- **Name of the lecturer:** dr inż. Jacek Kurnatowski
- **Course contents:**
- **Assignment:**
  - Design of a lowland river regulation system at 2 km long river stretch – routing, choice of the regulation system, structures arrangement, construction and performance.
- **Recommended reading:**

**Course title:** SPECIAL CONSTRUCTIONS TECHNOLOGY IN HYDROENGINEERING

- **Code:** B/S1/OiZ/-/59
- **ECTS points:** 3
- **Semester:** summer
- **Hours:** L-15, P-15
- **Language:** English
- **Teaching method:**
- **Name of the lecturer:** dr inż. Jacek Kurnatowski
- **Course contents:**
- **Assignment:**
  - Design of a I0 class flood protection dike along a lowland river.
- **Recommended reading:**

**Course title:** SITE MANAGEMENT II

- **Code:** B/S1/OiZ/-/60
- **ECTS points:** 3
- **Semester:** summer
- **Hours:** L-15, P-15
- **Language:** English
- **Teaching method:**
- **Name of the lecturer:** mgr inż. Krzysztof Tracz
- **Course contents:**
  - Basics of site cost management, type of costs and their registration in construction company, calculation of labor costs, the principles of Works process estimation, methodology of extra/alternation Works, claiming, planning and monitoring of site budget by Contractor.
  - The basics of time management on site, types of schedules and their implementation, Critical Path Method – network schedules, methods of project schedule up-dating - MS Project using for planning and monitoring of construction works, basic principles of delays avoiding within contract execution.
- **Assignment:**
  - estimation of labor rate for established contract conditions,
  - estimation of the value of alternative Works
  - working out of time Schedule and the Project budget by means of MS Project
- **Recommended reading:**
  - Rory Burke „ Project management – planning and control" - John Wiley &Sons, 1993
  - A guide to the Project Management body of knowledge – PMI standards committee 2000
1. **Course title:** **ORGANIZATION OF CONSTRUCTION ENTERPRISES II**

2. Code: B/S1/OiZ/-/61
3. ECTS points: 3
4. Semester: summer
5. Hours: L-15, P-15
6. Language: English
7. Teaching method:
8. Name of the lecturer: mgr A. Siewiera
9. Course contents:
   Legal aspects of stock joint ventures action (Poland and UE) – registration procedure, act of law, share holders rights- stock exchange, joint venture bodies; yearly turnover balance – financial reporting and activity assessment, sharing of the profit; liquidated procedure, civil law responsibility; employment regulations, the cards of employment posts, assessment forms of employees
10. Assignment:
   Case study of construction company (~360 yearly employment) : company policy, organization chart, working codes, assessment forms (operatives and staff), marketing plan, PR and advertising strategy.
11. Recommended reading:

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1. **Course title:** **FINANCES AND ACCOUNTANCY II**

2. Code: B/S1/OiZ/-/62
3. ECTS points: 3
4. Semester: summer
5. Hours: L-15, P-15
6. Language: English
7. Teaching method:
8. Name of the lecturer: dr Małgorzata Gorzańska – Koczkodaj
9. Course contents:
   Definition and principles of accountancy, its goals in company actions, balance sheet and profit and loss estimation, the way of registration of trade occurrences, definition of management accountancy, costs and incomes classifying, the useful information from management accountancy for making short-term decisions, the meaning and types of company budgets, case study of public financing.
10. Assignment:
   The types of accountancy documents, the principles of balance accounts, basics of accounts organization chart (synthetic and analytic), Depreciation methods and its calculation, costs and incomes measurement – costs registration, operational budgets, financial budgets, activity budgets, calculation of net profit of different kind of contracts.
11. Recommended reading:

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1. **Course title:** **BUILDING PHYSICS II**

2. Code: B/S1/OiZ/-/63
3. ECTS points: 3
4. Semester: summer
5. Hours: L-15, P-30
6. Language: English
7. Teaching method:
8. Name of the lecturer: dr inż. arch. Karolina Kurtz, dr inż. Agata Siwińska
9. Course contents:
   - **Heat – the thermal environment:** Nature of heat flow, Thermal behaviour of buildings, Thermal designs: passive controls (passive control of heat flow, control functions of design variables, climatic design archetypes, condensation and moisture control, microclimatic controls), Active controls: HVAC (heat, ventilation, air conditioning, cooling systems);
   - **Light – the luminous environment:** Physics of light (attributes of light, photometry, transmission of light), Vision, Daylight and sunlight (sky conditions, daylight illuminance, luminance distribution, overshadowing, control of sunlight), Electric lighting;
   - **Sound – the sonic environment:** Physics of sound (attributes and propagation of sound, acoustic quantities), Hearing (noise – definition and rating, spectra and climate of noise), Noise control (sound transition, control of environmental noise, barriers and sound insulation), Room acoustics;
   - **Resources:** Energy: forms of energy, energy sources and conservation, renewable energy (wind, solar, geothermal, biomass energy, ground source heat pumps GSHP), Energy use: energy use in buildings, energy conservation, Water and wastes, Sustainability issues: energy, materials, wastes
10. Assignment:
   Integrated environmental design – energy conservation redesign project of buildings with
determined energy characteristics: heat (energy) demand factor or energy class.

11. Recommended reading:
- The European Directive for the Energy Performance of Buildings (EPBD)

<table>
<thead>
<tr>
<th>1. Course title: COMPOSITE CONSTRUCTIONS</th>
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<tbody>
<tr>
<td>2. Code: B/S1/OiZ/64</td>
</tr>
<tr>
<td>6. Language: English</td>
</tr>
<tr>
<td>8. Name of the lecturer: dr inż. Tomasz Wróblewski</td>
</tr>
<tr>
<td>9. Course contents:</td>
</tr>
<tr>
<td>10. Assignment:</td>
</tr>
<tr>
<td>Contents of the design:</td>
</tr>
<tr>
<td>1) Concise description of the floor.</td>
</tr>
<tr>
<td>2) Structural analysis: slab, floor beam, binding joist, connectors.</td>
</tr>
<tr>
<td>3) Drawings.</td>
</tr>
</tbody>
</table>

| 11. Recommended reading: |

<table>
<thead>
<tr>
<th>1. Course title: PROJECT MANAGEMENT 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Semester: summer</td>
</tr>
<tr>
<td>6. Language: English</td>
</tr>
<tr>
<td>8. Name of the lecturer: mgr inż. Krzysztof Tracz</td>
</tr>
<tr>
<td>9. Course contents:</td>
</tr>
<tr>
<td>Life cycle of investment process – efficiency analysis and planning of Project, preliminary project frames, monitoring and control of construction project, scope management, Cost management and reporting, analysis of scope changes in respect to Project outcomes, progress reports, Earned Value method of monitoring, implementation and control of communication system in investment process, basic tools of quality management during construction process– Method Statement, Quality Plan, Non conformance report.</td>
</tr>
<tr>
<td>10. Assessment methods:</td>
</tr>
<tr>
<td>Case studies</td>
</tr>
<tr>
<td>– preliminary budget and efficiency calculation,</td>
</tr>
<tr>
<td>– cash-flow of the construction project,</td>
</tr>
<tr>
<td>– calculation of earned value of project,</td>
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<tr>
<td>– correction methods to budget and project delays,</td>
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<tr>
<td>– examples of reports and MOMs</td>
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</table>

11. Recommended reading:
1. Course title: **CONSTRUCTION LAW**

2. Code: B/S1/OiZ/-/-2
3. ECTS points: 3
4. Semester: summer
5. Hours: L-15, C.-15
6. Language: English
7. Teaching method:
8. Name of the lecturer: mgr inż. Krzysztof Tracz

**Course contents:**
1. Construction law, scope of law act (construction-administrative organizations, organization of construction supervision), investment process (participants of investment process, duties and responsibilities of construction process members).
2. Regulations of administrative procedure (summons, procedure notice, provision, decision, property of organization, deadlines of deliveries),
3. Local government acts (municipality, district, county – marshal, voivode),
4. Independent functions in construction process, scope and form of construction design,
5. Claims and renewal of the procedure in respect to issued decisions.

10. Assessment methods:
Exercises in writing of applications to administrative departments of construction. Necessary permissions in construction process.

**Recommended reading:**
- Rory Burke „Project management – planning and control” - John Wiley & Sons, 1993
### DIGITAL IMAGE PROCESSING

1. Course title: DIGITAL IMAGE PROCESSING  
2. Code: 1-WI-09/10  
3. ECTS points: 4  
4. Semester: winter  
5. Hours per week:  
6. Language: English  
7. Teaching method:  
8. Name of the lecturer: dr inż. Paweł Forczmański  
9. Course contents: Digital Image Processing on various image representations, image acquisition, techniques and basic processing such as elementary image features and characteristics, histogram manipulations, spatial filtering and transformations. During laboratories selected algorithms will be realized as computer programs in MATLAB environment.  
10. Assessment methods:  
11. Recommended reading:  

### TELEINFORMATION NETWORK

1. Course title: TELEINFORMATION NETWORK  
2. Code: 2-WI-09/10  
3. ECTS points: 5  
4. Semester: winter  
5. Hours per week:  
6. Language: English  
7. Teaching method:  
8. Name of the lecturer: prof. dr hab. inż. Oleg Zikin  
9. Course contents: The proposed to students lecture tends to give conception and formal mathematical body in new domain area- distributed intelligent production and supply chain. It is oriented on specialists and students of specialities “management and Engineering of production”, “computer networks and Telecommunication”  
10. Assessment methods:  
11. Recommended reading:
### Material Science Courses: WINTER SEMESTER

<table>
<thead>
<tr>
<th>Course title: <strong>FUNDAMENTAL OF MATERIALS SCIENCE</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Code: 1W-WIMiM-09/10</td>
<td>ECTS points: 4</td>
</tr>
<tr>
<td>Semester: winter</td>
<td>Hours per week: L-2, T-1</td>
</tr>
<tr>
<td>Language: English</td>
<td>Teaching method:</td>
</tr>
<tr>
<td>Name of the lecturer: dr W. Jasiński, dr M. Ustasiak, prof. B. Piekarski</td>
<td></td>
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<tr>
<td>Assessment methods:</td>
<td></td>
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<tr>
<td>Recommended reading:</td>
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<table>
<thead>
<tr>
<th>Course title: <strong>METALLIC MATERIALS</strong></th>
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<tbody>
<tr>
<td>Code: 2W-WIMiM-09/10</td>
<td>ECTS points: 4</td>
</tr>
<tr>
<td>Semester: winter</td>
<td>Hours per week: L-2, T-2</td>
</tr>
<tr>
<td>Language: English</td>
<td>Teaching method:</td>
</tr>
<tr>
<td>Name of the lecturer: prof. J. Nowak</td>
<td></td>
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<tr>
<td>Assessment methods:</td>
<td></td>
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<tr>
<td>Recommended reading:</td>
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<thead>
<tr>
<th>Course title: <strong>CERAMICS</strong></th>
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<tbody>
<tr>
<td>Code: 3W-WIMiM-09/10</td>
<td>ECTS points: 4</td>
</tr>
<tr>
<td>Semester: winter</td>
<td>Hours per week: L-2, T-1</td>
</tr>
<tr>
<td>Language: English</td>
<td>Teaching method:</td>
</tr>
<tr>
<td>Name of the lecturer: prof. J. Nowacki</td>
<td></td>
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<tr>
<td>Assessment methods:</td>
<td></td>
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<tr>
<td>Recommended reading:</td>
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<table>
<thead>
<tr>
<th>Course title: <strong>POLYMER MATERIALS II</strong></th>
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<tbody>
<tr>
<td>Code: 4W-WIMiM-09/10</td>
<td>ECTS points: 4</td>
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<td>Course title</td>
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<tr>
<td>SURFACE ENGINEERING</td>
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<tr>
<td>Course title: POLYMER MATERIALS III</td>
<td>2. Code: 9S-WiMiM-09/10</td>
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<tr>
<td>4. Semester: summer</td>
<td>5. Hours per week: L-2, T-2</td>
</tr>
<tr>
<td>6. Language: English</td>
<td>7. Teaching method:</td>
</tr>
<tr>
<td>8. Name of the lecturer: prof. Z. Rosłaniec, dr A. Szymczyk</td>
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<tr>
<td>10. Assessment methods:</td>
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<td>11. Recommended reading:</td>
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<table>
<thead>
<tr>
<th>Course title: POLYMER PROCESSING II</th>
<th>2. Code: 10S-WiMiM-09/10</th>
<th>3. ECTS points: 5</th>
</tr>
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<tbody>
<tr>
<td>4. Semester: summer</td>
<td>5. Hours per week: L-2, T-2</td>
<td></td>
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<tr>
<td>6. Language: English</td>
<td>7. Teaching method:</td>
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</tr>
<tr>
<td>8. Name of the lecturer: dr M. Urbaniak, dr M. Kacperski</td>
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<tr>
<td>10. Assessment methods:</td>
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<tr>
<td>11. Recommended reading:</td>
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<tr>
<th>Course title: COMPOSITES II</th>
<th>2. Code: 11S-WiMiM-09/10</th>
<th>3. ECTS points: 4</th>
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<tr>
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<td>6. Language: English</td>
<td>7. Teaching method:</td>
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</tr>
<tr>
<td>8. Name of the lecturer: dr M. Królikowski, prof. W. Biedunkiewicz</td>
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<tr>
<td>10. Assessment methods:</td>
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<td>11. Recommended reading:</td>
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<th>Course title: RECYCLING I</th>
<th>2. Code: 12S-WiMiM-09/10</th>
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<td>6. Language: English</td>
<td>7. Teaching method:</td>
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<td>8. Name of the lecturer:</td>
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<tr>
<td>9. Course contents:</td>
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<td>10. Assessment methods:</td>
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<td>11. Recommended reading:</td>
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<tr>
<td>1. Course title: <strong>PACKAGING I</strong></td>
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<td>4. Semester: summer</td>
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<td>5. Hours per week: L-1</td>
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<tr>
<td>8. Name of the lecturer: prof. A. Błędzki</td>
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<tr>
<th>1. Course title: <strong>FUNDAMENTAL MATERIALS</strong></th>
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<td>2. Code: 14S-WIMiM-09/10</td>
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<td>3. ECTS points: 4</td>
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<td>6. Language: English</td>
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<td>7. Teaching method:</td>
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<td>8. Name of the lecturer: dr J. Typek</td>
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<td>10. Assessment methods:</td>
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<td>11. Recommended reading:</td>
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<tr>
<th>1. Course title: <strong>NANOMATERIALS</strong></th>
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<td>2. Code: 15S-WIMiM-09/10</td>
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<td>5. Hours per week: L-2</td>
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<td>6. Language: English</td>
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<tr>
<td>7. Teaching method:</td>
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<tr>
<td>8. Name of the lecturer: dr M. Kwiatkowska, dr A. Biedunkiewicz</td>
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<tr>
<td>10. Assessment methods:</td>
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<tr>
<td>11. Recommended reading:</td>
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<table>
<thead>
<tr>
<th>1. Course title: <strong>BIOMATERIALS</strong></th>
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<tbody>
<tr>
<td>2. Code: 16S-WIMiM-09/10</td>
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<tr>
<td>3. ECTS points: 3</td>
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<td>4. Semester: summer</td>
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<td>5. Hours per week: L-2, T-2</td>
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<td>6. Language: English</td>
</tr>
<tr>
<td>7. Teaching method:</td>
</tr>
<tr>
<td>8. Name of the lecturer: prof. A. Błędzki</td>
</tr>
<tr>
<td>9. Course contents:</td>
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</tbody>
</table>
Polymeric biomaterials: basic concepts of biocompatibility; synthetic polymers and composites as implants; biodegradable polymers for tissue engineering; stimuli responsive polymers for drug delivery; metals and ceramic in biomedical applications; environmental management of biodegradable polymers.

10. Assessment methods:

11. Recommended reading:

### Course title: CORROSION PROTECTION

2. Code: 17S-WIMIM-09/10  
3. ECTS points: 3  
4. Semester: summer  
5. Hours per week: L-1, T-1  
6. Language: English  
7. Teaching method:  
8. Name of the lecturer: dr A. Biedunkiewicz  
9. Course contents:  

10. Assessment methods:

11. Recommended reading:

### Department of Thermal Technology Courses:

#### Course title: ENERGY MANAGEMENT

2. Code: 18-WIMIM-09/10  
3. ECTS points: 4  
4. Semester:  
5. Hours per week: L-2, T-1  
6. Language: English  
7. Teaching method:  
8. Name of the lecturer: prof. nadzw. dr hab. inż. J. Eliasz  
9. Course contents:  
10. Assessment methods:

11. Recommended reading:

#### Course title: MODERN POWER SYSTEMS

2. Code: 19-WIMIM-09/10  
3. ECTS points: 4  
4. Semester:  
5. Hours per week: L-2, T-1  
6. Language: English  
7. Teaching method:  
8. Name of the lecturer: prof. nadzw. dr hab. inż. J. Eliasz  
9. Course contents:  
10. Assessment methods:

11. Recommended reading:

#### Course title: ENVIRONMENTAL MANAGEMENT IN ENERGY SECTOR

2. Code: 20-WIMIM-09/10  
3. ECTS points: 4  
4. Semester:  
5. Hours per week: L-2, T-1  
6. Language: English  
7. Teaching method:  
8. Name of the lecturer: prof. nadzw. dr hab. inż. J. Eliasz  
9. Course contents:  
10. Assessment methods:

11. Recommended reading:

#### Course title: RENEWABLE ENERGY SOURCES

2. Code: 21-WIMIM-09/10  
3. ECTS points: 4  
4. Semester:  
5. Hours per week: L-2, P-1
6. Language: English  
7. Teaching method:  
8. Name of the lecturer: dr A. Borsukiewicz- Gozdur  
9. Course contents:  
   Introduction to sources of renewable energy.  
   - Biomass (material, biomass end-products, conversion).  
   - Solar energy (thermal systems, PV-technology, PV-systems).  
   - Wind energy.  
   - Hydroenergy (small hydropower, marine currents, wave energy).  
   - Geothermal energy.  
   - Possibilities of renewable energy utilisation: heat production, electricity production.  
   - Power plant with ORC.  
   - Fuel cells.  
   - Project of power plant with Organic Rankine Cycle supplied by geothermal energy.  
10. Assessment methods:  
11. Recommended reading:  

1. Course title: **FUELS AND COMBUSTION TECHNOLOGIES**  
2. Code: 22-WIMIM-09/10  
3. ECTS points: 3  
4. Semester:  
5. Hours per week: L-2,  
6. Language: English  
7. Teaching method:  
8. Name of the lecturer: dr A. Majchrzycka  
9. Course contents:  
   Basic properties and concepts.  
   - Resources of fossil fuels.  
   - Hard and brown coal and other solid fuels (properties, solid fuel combustion technologies, boiler energy balance, rational use).  
   - Gaseous fuels: natural gas, coal-derived gaseous fuels, biomass and synthetic gas, hydrogen (production, properties, combustion technologies, rational use).  
   - Crude oil and distillate fuels, synthetic liquids fuels, unconventional liquid fuels and lubricants (production, properties, combustion technologies, rational use).  
   - Purification of flue gases.  
10. Assessment methods:  
11. Recommended reading:  

1. Course title: **HEAT TRANSFER**  
2. Code: 23-WIMIM-09/10  
3. ECTS points: 4  
4. Semester:  
5. Hours per week: L-2, T-1  
6. Language: English  
7. Teaching method:  
8. Name of the lecturer: dr A. Majchrzycka  
9. Course contents:  
   Basics of heat transfer: introduction, definitions, modes of heat transfer.  
   Heat transfer at solid fluid boundaries of uniform heat transfer coefficients at the surfaces. Heat transfer between fluids inside and outside pipes overall heat transfer coefficient, critical and economical thickness of pipe insulation.  
   - Dimensional analysis, Pi-theorem, application to heat transfer. Reynolds, Prandtl, Nusselt, Stanton, Grashof and Rayleigh numbers.  
   - Flow in pipes with uniform surface heat transfer coefficient.  
   - Boiling. Nucleation, boiling regimes, pool-boiling curve, heat transfer coefficients.  
   - Condensation: film condensation and dropwise condensation. Effects of non-condensing gases and vapour velocity on heat transfer coefficient during condensation.  
   - Fins, fins’ efficiency.
- Heat exchangers of constant heat transfer coefficients and fluid properties. Logarithmic mean temperature difference. NTU-method.

10. Assessment methods:

11. Recommended reading:

1. Course title: **TERMODYNAMICS**

2. Code: 24-WIMIM-09/10
3. ECTS points: 4
4. Semester:
5. Hours per week: L-2, T-1
6. Language: English
7. Teaching method:
8. Name of the lecturer: dr A. Majchrzycka
9. Course contents:
   - Basic properties and concepts: thermodynamic definitions, thermodynamic processes, irreversible and reversible processes, energy, pressure, temperature.
   - The First Law of Thermodynamics: energy of a system, work, heat, state functions (internal energy, enthalpy), conservation of mass, conservation of energy, adiabatic and cyclic processes.
   - Ideal gas law. Mixtures of ideal gases.
   - Thermodynamic properties of pure substances and equations of state: liquid and vapor phases, quality of liquid vapor mixture, steam tables, equations of state.
   - Gas processes.
   - The combustion process: fuels, chemical reactions, stoichiometric calculations, mass and energy balance.
   - Properties of moist air, psychrometric charts.
10. Assessment methods:
11. Recommended reading:

1. Course title: **STEAM AND GAS TURBINE**

2. Code: 25-WIMIM-09/10
3. ECTS points: 3
4. Semester:
5. Hours per week: L-2, T-2
6. Language: English
7. Teaching method:
8. Name of the lecturer: dr hab. inż. Zbigniew Zapałowicz
9. Course contents:
   - Introduction (main information about turbines; axial and radial turbines; steam, gas and water turbines; etc.),
   - Steam flow in guide ring,
   - Steam flow in guide vanes,
   - Impulse stage of steam turbine,
   - Reaction stage of steam turbine,
   - Curtis stage of steam turbine,
   - Multistage steam turbines,
   - Construction of steam turbine and its main parts,
   - Energy balance of steam turbine; energy losses,
   - Power regulation of steam turbine,
   - Operating of steam turbines,
   - Gas turbines in power station,
   - Gas flow in turbine,
   - Constructions of gas turbine,
   - Operating of gas turbines.
10. Assessment methods:
11. Recommended reading:
### NUTZPLANZEN DER TROPEN UND SUBTROPEN

1. **Course title:** NUTZPLANZEN DER TROPEN UND SUBTROPEN  
2. **Code:** 1-WKSiR-09/10  
3. **ECTS points:** 6  
4. **Semester:** winter  
5. **Hours per week:**  
6. **Language:** German  
7. **Teaching method:**  
8. **Name of the lecturer:** Dr. Ing. Marek Bury  
9. **Course contents:**  
10. **Assessment methods:**  
11. **Recommended reading:**

### PROÖKOLOGISCHE ANBAUVERFAHREN IN PFLANZENBAU

1. **Course title:** PROÖKOLOGISCHE ANBAUVERFAHREN IN PFLANZENBAU  
2. **Code:** 2-WKSiR-09/10  
3. **ECTS points:** 6  
4. **Semester:** winter  
5. **Hours per week:**  
6. **Language:** German  
7. **Teaching method:**  
8. **Name of the lecturer:** Dr. Ing. Marek Bury  
9. **Course contents:**  
   Es werden Anbautechnologien von landwirtschaftlichen Kulturpflanzen (Getreide und Schmetterlingsblütler, öl- und eiweißliefernden Pflanzen, Hackfrüchte) in ökologischen Betrieben (biodynamische Methode im Ökobau) mit aufwandintensiven Landwirtschaft verglichen und auf die Unterschiede hinsichtlich der Bedeutung, Fruchtfolgeeinordnung und Anbauverfahren hingedeutet.  
10. **Assessment methods:**  
11. **Recommended reading:**

### ANBAUTECHNOLOGY VON INDUSTRIEPFLANZEN

1. **Course title:** ANBAUTECHNOLOGY VON INDUSTRIEPFLANZEN  
2. **Code:** 3-WKSiR-09/10  
3. **ECTS points:** 6  
4. **Semester:** winter  
5. **Hours per week:**  
6. **Language:** German  
7. **Teaching method:**  
8. **Name of the lecturer:** Dr. Ing. Marek Bury  
9. **Course contents:**  
   Anbautechnologie von Industriepflanzen und Hackfrüchte umfasst wirtschaftliche Bedeutung, Botanik (kurze Charakteristik), Standortbedingungen (Boden- und Klimaverhältnisse) und die detaillierten Anbauverfahren von öl- und faserliefernden Pflanzen (Raps, Leindotter, Ölsenf, Lein und Flachs, Hanf) und wichtigen Hackfrüchten (Kartoffeln, Zuckerrüben), die in Polen angebaut sind.  
10. **Assessment methods:**  
11. **Recommended reading:**
### Course Title: ANBAU VON ALTERNATIVPFLANZEN

2. Code: 4-WKSIR-09/10  
4. Semester: summer  
6. Language: German  
8. Name of the lecturer: Dr. Ing. Marek Bury

9. Course contents:  
Anbau von Alternativpflanzen ist den Anbautechnologien von Pflanzen gedacht, die nicht für die Nahrungsproduktion dienen, nur als nachwachsende Rohstoffe für Industrie oder als Energiequelle angebaut werden können, z.B. in Form von Biogas (Sudangras, Zuckerhirse, Malve), Wärme (schnellwachsende Baumarten: Weide, Pappeln) oder Wärme / Elektroenergie (Topinambur, Miscanthus, Sida hermaphroditica), aber auch in Form von Bioethanol / Biodiesel (Roggen, Triticale, Raps). Es wird über die wirtschaftliche Bedeutung, Botanik (kurze Charakteristik), Standortbedingungen (Boden- und Klimaverhältnisse) und gewählte Anbauverfahren berichtet.

10. Assessment methods:

11. Recommended reading:

### Course Title: TYPENBESCHREIBUNG UND KARTIERUNG VON WALDSTANDORTEN

2. Code: 5-WKSIR-09/10  
4. Semester: summer  
6. Language: German  
8. Name of the lecturer: Dr. Ing. Tadeusz Leśnik

9. Course contents:  

10. Assessment methods:

11. Recommended reading:

### Course Title: ANBAUTECHNOLOGIE VON GETREIDE UND SCHMETTERLINGSGSBÜTLER

2. Code: 6-WKSIR-09/10  
4. Semester: summer  
6. Language: English  
8. Name of the lecturer: Dr. Ing. Marek Bury

9. Course contents:  
Anbautechnologie von Getreide und Schmetterlingsblütler umfasst wirtschaftliche Bedeutung, Botanik (kurze Charakteristik), Standortbedingungen (Boden- und Klimaverhältnisse) und die detaillierten Anbauverfahren von allen Getreidearten einschließlich von Mais, Hirse und Buchweizen sowie Anbauverfahren von Hülsenfrüchte und mehrjährige Leguminosen, die in Polen angebaut sind.

10. Assessment methods:

11. Recommended reading:
<table>
<thead>
<tr>
<th>Course title: <strong>BIOTECHNOLOGY IN AGRICULTURE</strong></th>
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<tr>
<td>8. Name of the lecturer: prof. dr hab. Piotr Masojć</td>
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<thead>
<tr>
<th>Course title: <strong>CHARACTERIZATION OF SELECTED HORTICULTURAL CROPS</strong></th>
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<tr>
<td>2. Code: 8-WKSIR-09/10</td>
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<td>4. Semester: summer</td>
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<td>6. Language: English</td>
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<td>7. Teaching method:</td>
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<tr>
<td>9. Course contents: The course consists of 15 hours of lectures on classification (botanical and horticultural) origin, structure, and quality standards of main horticultural crops. Also, the lectures cover quality features (appearance, texture, flavor, nutritive value, and safety) of fruits of temperate and tropical zone, vegetables, spice herbs, and edible flowers.</td>
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<td>10. Assessment methods:</td>
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<td>11. Recommended reading:</td>
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<tr>
<th>Course title: <strong>BIOLOGICAL PROTECTION OF PATHOGENS</strong></th>
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<td>2. Code: 9-WKSIR-09/10</td>
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<td>4. Semester: summer</td>
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<td>5. Hours per week</td>
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<td>6. Language: English</td>
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<td>7. Teaching method:</td>
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<tr>
<td>8. Name of the lecturer: prof. dr hab. Janusz Blaszkowski</td>
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<td>10. Assessment methods:</td>
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<td>11. Recommended reading:</td>
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<thead>
<tr>
<th>Course title: <strong>SOIL TILLAGE IN SUSTAINABLE AGRICULTURE</strong></th>
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<tr>
<td>2. Code: 10-WKSIR-09/10</td>
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<td>3. ECTS points: 5</td>
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<td>4. Semester:</td>
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<td>6. Language: English</td>
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<td>7. Teaching method:</td>
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<tr>
<td>8. Name of the lecturer: dr inż. Jacek Wereszczaka</td>
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10. Assessment methods:

11. Recommended reading:

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1. Course title: THE PRINCIPALS OF GOLF COURSES CONSTRUCTION

2. Code: 11- WKSIR-09/10

3. ECTS points: 5

4. Semester: summer

5. Hours per week

6. Language: English

7. Teaching method:

8. Name of the lecturer: dr inż. Jacek Wereszczaka

9. Course contents:
The course matter activities are oriented to student of golf course architects and golf course turfgrass culture in adult short courses, novice golf course workers, golf course superintendents, golf club officials, course owners, green committee chairs. Lectures: The overview of golf, its history, golf course measurement, course operations and architecture, side selection, construction. Soil properties and soil fertility, turfgrass selection, establishment and culture of putting greens, tees, fairways, roughs and bunkers will be presented. The irrigation systems, nutrient, turfgrass and pest management will be describe. Additionally, the environmental stress including their diagnosis, identification and control will be discussed. Activities: a capture of practical methods of golf course construction, soil properties on an examples of chosen golf courses will be presented during the practice field activities (two excursions).

10. Assessment methods:

11. Recommended reading:

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1. Course title: THE BIOMASS PRODUCTION ON ARABLE LANDS

2. Code: 12-WKSIR-09/10

3. ECTS points: 5

4. Semester: summer

5. Hours per week

6. Language: English

7. Teaching method:

8. Name of the lecturer: dr inż. Jacek Wereszczaka

9. Course contents:
The course presents some of the facts and fundamental principles sensational to an understanding of field biomass production in Poland. The major crops are grouped into chapters in accordance with their botanical relationship to better understanding their development and grooving stages. It also should serve as a reference to those concerned with biomass production, and should help raise the level of field crop instruction. The course offers a choice of subject meet different industrial and local requirements. Lectures: Agronomy is the branch of agriculture that treats of the principles and practice of crop production and field management. Crop culture will always be an important industry because biomass production are essential for world existence of man. The problem of sufficient food for a population that continues to increase in a word of limited land area is growing referring to European Union directives and Kioto protocol. Now, we have to find the compromise between food and nonfood production in arable lands. The introduction to crop plants in relation to environment compared to principals of tillage, using fertilizers, green manuring, and rotation practices, additionally theory of seeds and seeding, pests control and biomass - yields and its quantity and quality should help to understand environment friendly agriculture. Activities: a capture of practical methods of biomass production, soil properties, plants growing stages on chosen fields will be presented during the practice field activities (two excursions).

10. Assessment methods:

11. Recommended reading:
<table>
<thead>
<tr>
<th>Course title: FLORICULTURE PRODUCTION – CUT FLOWERS</th>
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<tbody>
<tr>
<td><strong>1. Course title:</strong> FLORICULTURE PRODUCTION – CUT FLOWERS</td>
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<tr>
<td><strong>2. Code:</strong> 13-KSIR-09/10</td>
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<td><strong>4. Semester:</strong> summer</td>
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<td><strong>6. Language:</strong> English</td>
</tr>
<tr>
<td><strong>8. Name of the lecturer:</strong> prof. dr hab. Joanna Nowak</td>
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<td><strong>10. Assessment methods:</strong></td>
</tr>
<tr>
<td><strong>11. Recommended reading:</strong></td>
</tr>
</tbody>
</table>
### NUTRITION IN DIFFERENT PHYSIOLOGICAL STATES

**1. Course title:** NUTRITION IN DIFFERENT PHYSIOLOGICAL STATES

<table>
<thead>
<tr>
<th>2. Code: 1WNoZiR-09/10</th>
<th>3. ECTS points: 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Semester: winter</td>
<td>5. Hours per week:</td>
</tr>
<tr>
<td>6. Language: English</td>
<td>7. Type of studies: second degree</td>
</tr>
<tr>
<td>8. Name of the lecturer: dr inż. Joanna Sadowska</td>
<td></td>
</tr>
</tbody>
</table>

#### Course contents:

The subject matter of course:

1. Rules and purpose of nutrition of women before the conception.
2. Changes in the metabolism in pregnancy and connected with them nutritional recommendations.
3. Nutrition in lactation (requirement on basic components of the diet, the influence of components of the diet on milk composition and the volume of lactation).
5. Nutrition of infants to 12 months of life.
6. The adaptation of nutrition to developmental changes of children and youth with the special consideration of the time of adolescence. Disturbances of nutrition.
7. Physiological and metabolic changes in the time of menopause and andropause. The nutritional prevention of diseases of the elderly.
8. Nutrition of elder (specific nutritional problems in elderly and connected with them requirement on nutrition components).

#### Assessment methods:

10. Recommended reading:

#### ERNÄHRUNGSSYSTEME UND DIÄTEN - PHYSIOLOGISCHE ASPEKTE

**1. Course title:** ERNÄHRUNGSSYSTEME UND DIÄTEN - PHYSIOLOGISCHE ASPEKTE

<table>
<thead>
<tr>
<th>2. Code: 2WNoZiR-09/10</th>
<th>3. ECTS points: 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Semester: winter</td>
<td>5. Hours per week:</td>
</tr>
<tr>
<td>6. Language: German</td>
<td>7. Type of studies: second degree</td>
</tr>
<tr>
<td>8. Name of the lecturer: dr inż. Magdalena Radziszewska</td>
<td></td>
</tr>
</tbody>
</table>

#### Course contents:

Die Thematik:

- Das Essen und die Gesundheit in primitiven Kulturen.
- Die Bedürfnisse des Organismus in der psychosomatischen Entwicklung.
- Die Physiologie des Geschmackssinnes und des Geruchssinnes und ihr Einfluss auf das Aufnehmen der Nahrung.
- Anopsologie - die Art der Ernährung nach dem Instinkt.
- Hay'sche Trennkost - alles roh und was das für uns bedeutet?
- Die Lehren der Essener und die Diät nach Edmond Szekely.
- „Das Leben eines Menschen wird durch seine Ernährung bestimmt" - Makrobiotik.
- Das Leben ohne Fleisch - vegetarische Ernährung als die Begründung von anatomischen und physiologischen Eigenschaften des Verdauungskanals.
- Chronobiologische Diät - die Art der Ernährung nach dem biologischem Rhythmus.
- Diamond's Diät - stimmt sie wirklich mit dem biologischem Rhythmus überein?
- Die Trennkost und ihre Begründung in der Physiologie.
- Glyx-Diät nach Prof. David Jenkins und Glykämischer Index.
- Der Einfluss der Ernährung auf die geistige Leistungsfähigkeiten und Stimmung.
- Blutgruppen-Diät - Essen nach dem Bluttyp.
- Ist Steinzeit-Diät die artgerechte Ernährung? Schlank und gesund durch reichlich
### HYGIENE IN FOOD INDUSTRY

<table>
<thead>
<tr>
<th>1. Course title:</th>
<th>HYGIENE IN FOOD INDUSTRY</th>
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</thead>
<tbody>
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<td>2. Code:</td>
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<td>3. ECTS points:</td>
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<tr>
<td>6. Language:</td>
<td>English</td>
</tr>
<tr>
<td>7. Type of studies:</td>
<td>second degree</td>
</tr>
<tr>
<td>8. Name of the lecturer:</td>
<td></td>
</tr>
<tr>
<td>9. Course contents:</td>
<td>Providing the students with the knowledge of: the sanitary-hygienic requirements applicable in the food production, regulations concerning work safety and methods to ensure the task fulfillment according to these requirements.</td>
</tr>
<tr>
<td>10. Assessment methods:</td>
<td>Credit for classes and final examination</td>
</tr>
<tr>
<td>11. Recommended reading:</td>
<td></td>
</tr>
</tbody>
</table>

### PESTS IN FOOD INDUSTRY AND THEIR CONTROL

<table>
<thead>
<tr>
<th>1. Course title:</th>
<th>PESTS IN FOOD INDUSTRY AND THEIR CONTROL</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Code:</td>
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</tr>
<tr>
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<td>4. Semester:</td>
<td>winter</td>
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<td>5. Hours per week:</td>
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<tr>
<td>6. Language:</td>
<td>English</td>
</tr>
<tr>
<td>7. Type of studies:</td>
<td>second degree</td>
</tr>
<tr>
<td>8. Name of the lecturer:</td>
<td></td>
</tr>
<tr>
<td>9. Course contents:</td>
<td>Theoretical and practical introduction of the students to the problems related with the presence of pests, preventive methods and methods of control.</td>
</tr>
<tr>
<td>10. Assessment methods:</td>
<td>Credit for classes and final examination</td>
</tr>
<tr>
<td>11. Recommended reading:</td>
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### SELECTED TOXICOLOGY PARTS

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<thead>
<tr>
<th>1. Course title:</th>
<th>SELECTED TOXICOLOGY PARTS</th>
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<tbody>
<tr>
<td>2. Code:</td>
<td>5WNoZiR-09/10</td>
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<tr>
<td>3. ECTS points:</td>
<td>4</td>
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</tbody>
</table>
4. Semester: summer  
5. Hours per week:  
6. Language: English  
7. Type of studies: second degree  
8. Name of the lecturer:  
9. Course contents:  
Acquiring the knowledge of the recent toxicological research and the applied modern methods of instrumental analysis 
Initial requirements: 
Knowledge of the rudiments of Biology, Biochemistry, Food Toxicology, Food Technology, Nutrition Physiology 
The significance of the analysis quality control in the toxicological research. Methods of the instrumental analysis and their significance in the modern toxicology. Tap water as a source of toxins and deleterious substances. Toxins of plants and animals. Toxicology of medicines and drugs. Toxicological assessment of packaging materials and other materials in contact with food. The transformations of the level of toxic compounds contents during the food processing and warehousing and the possibilities of deleterious substances occurrence.  
10. Assessment methods:  
Credit for classes and final examination  
11. Recommended reading:  

<table>
<thead>
<tr>
<th>Course title: <strong>DAIRY TECHNOLOGY</strong></th>
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<tbody>
<tr>
<td>2. Code: 6WNoŻiR-09/10</td>
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<tr>
<td>3. ECTS points: 8</td>
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<tr>
<td>4. Semester: summer</td>
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<tr>
<td>5. Hours per week:</td>
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<tr>
<td>6. Language: English</td>
</tr>
<tr>
<td>7. Type of studies: second degree</td>
</tr>
<tr>
<td>8. Name of the lecturer:</td>
</tr>
</tbody>
</table>
| 9. Course contents:  
Subject Dairy Technology is realized on the 2"1 year on the Food Technology and Human Nutrition studies. It consists 15 lectures and 9 laboratories. By participating in lectures students will be familiarized with physiology and biochemistry of lactation, chemical composition of milk, production technology of milk, fermented milk, butter, spreads, tvarogs and hard cheeses. Moreover, they will be familiarized with production of milk concentrates, use of whey and buttermilk. Also, membrane processes used in dairy industry will be presented. During laboratories, students will achieve skills of estimation of quality and technological suitability of raw milk, production and assessment of different kind of milk (for example pasteurized, sterilized, homogenized and ESL milk), production and assessment of fermented milk, production of milk concentrates, butter and melted cheeses.  
10. Assessment methods:  
11. Recommended reading: |

<table>
<thead>
<tr>
<th>Course title: <strong>FOOD TOXICOLOGY AND ITEMS OF COMMON USE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Code: 7WNoŻiR-09/10</td>
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<tr>
<td>3. ECTS points: 6</td>
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<tr>
<td>4. Semester: summer</td>
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<td>5. Hours per week:</td>
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<tr>
<td>6. Language: English</td>
</tr>
<tr>
<td>7. Type of studies: first degree</td>
</tr>
<tr>
<td>8. Name of the lecturer:</td>
</tr>
</tbody>
</table>
| 9. Course contents:  
Acquiring the knowledge of the problems of human health hazard resulting from natural and synthetic origin chemical compounds. 
Initial requirements: Rudiments of chemistry, physics and biochemistry 
Subject contents: 
Definition of poison/contaminant. Types of poisons and their toxicity. Toxic effect on the entire organism and individual organs and tissues. Poison/contaminant absorption and excretion ways. Accumulation of toxic compounds in selected organs and tissues. Metabolism of poisons/contaminants in human body with the breakdown into age, gender and health condition groups. Basic toxicological examinations on laboratory animals, determination of acute, subacute, chronic, carcinogenic toxicity, toxicity affecting reproduction ability, teratogenicity and mutagenicity. Metals and metalloids. Necessary and redundant elements (mercury, lead, cadmium and arsenium). Macro and microelements. Microelements shortages and excess content values: iodine, fluorine, cobalt, manganese, nickel, copper, selenium, zinc and others. Their presence in foodstuff and daily |

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necessities. Toxicity of the organic solvents. Natural poisoning/contaminating and deleterious compounds. Toxicology of the daily necessities (kitchenware, disinfectants and cleaning agents). Food packages. Construction materials: plasters, flooring, asbestos, furniture etc.

Methods of assessment:
Credit for classes and final examination

10. Assessment methods:
11. Recommended reading:

Fisheries Courses:

WINTER SEMESTER

1. Course title: CHEMICAL MONITORING IN THE ENVIRONMENTAL
2. Code: 8WNoZIPR-09/10
3. ECTS points: 3
4. Semester: winter
5. Hours per week:
6. Language: English
7. Teaching method:
8. Name of the lecturer:
9. Course contents:
Initial requirements: Hydrozoology, Protection of Water, Biology of fish, Fisheries Toxicology, Marine environment Toxicology
Subject contents: An object of the training is the introduction of students with monitoring and obligatory regulations in this range. Kinds of monitoring, tasks and role in the environmental protection. Hitherto existing results of systematical, long-term research. Indicatory organisms in monitoring research. Chosen methods of the modern instrumental analysis. The supervision over the quality of analyses and the part of interlaboratory-research in programs of chemical monitoring of the environment

10. Assessment methods:
11. Recommended reading:

1. Course title: TOXICOLOGICAL METHODS OF ENVIRONMENT QUALITY CONTROL
2. Code: 9WNoZIPR-09/10
3. ECTS points: 3
4. Semester: winter
5. Hours per week:
6. Language: English
7. Teaching method:
8. Name of the lecturer:
9. Course contents:
Acquiring the knowledge of testing and assessment methods of the water ecosystem hazard
Initial requirements:
Ecology, Biology of fish, Physiology of fish, Hydrozoology, Hydrobotany, Ecotoxicology or Fisheries Toxicology

10. Assessment methods:
11. Recommended reading:

SUMMER SEMESTER

1. Course title: TOXICOLOGY AND FODDERS HIGIENE IN PISCICULTURE
2. Code: 10WNoZIPR-09/10
3. ECTS points: 3
4. Semester: summer
5. Hours per week:
6. Language: English (Russian)  
8. Name of the lecturer: 
9. Course contents:  
   Initial requirements: Mariculture, Ecology, Hydrozoology, Hydrobotany, Hydrochemistry, Fish Biology, Fish Systematics, Fish Physiology  
   Subject contents: Recognition of typical warehouse-vermin, methods of their detection and fighting in fodders. Natural noxious substances and toxic (mycotoxins, antinutritional matters, vegetable poisons, animal) poisons in fodders. The denotation of basic undesirable chemical matters in fodders. The legislation and the official supervision over the production of fodders in Poland and in the world. 
   Methods of assessment: The credit of the part practical and theoretical (orally or in writing) 
10. Assessment methods: 
11. Recommended reading: 

<table>
<thead>
<tr>
<th>Course title: CELL BIOLOGY</th>
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<tbody>
<tr>
<td>2. Code: 11WNoZiR-09/10</td>
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<tr>
<td>4. Semester: summer</td>
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<tr>
<td>6. Language: English</td>
</tr>
<tr>
<td>8. Name of the lecturer:</td>
</tr>
<tr>
<td>9. Course contents:</td>
</tr>
<tr>
<td>- Subject contents: Prokaryotic and eucaryotic cells.</td>
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<tr>
<td>- The construction of cells.</td>
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<tr>
<td>- The molecules of life.</td>
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<tr>
<td>- Viruses: structure and function.</td>
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<tr>
<td>- Membrane structure.</td>
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<tr>
<td>- Organelle biogenesis.</td>
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<tr>
<td>- Cell motility and control of cell shape.</td>
</tr>
<tr>
<td>- Cell cycle.</td>
</tr>
<tr>
<td>- Research methods in cell biology.</td>
</tr>
<tr>
<td>- Golgi apparatus and plasmalemma: SER, RER, endosomes, lysosomes.</td>
</tr>
<tr>
<td>- Cell aging and death, apoptosis.</td>
</tr>
<tr>
<td>- Structure and functional relationships of endoplasmic reticulum.</td>
</tr>
<tr>
<td>- Chromosomal DNA: distribution, replication. RNA synthesis and role.</td>
</tr>
<tr>
<td>- Other organelles.</td>
</tr>
<tr>
<td>- Cancer and different types of cells</td>
</tr>
<tr>
<td>10. Assessment methods:</td>
</tr>
<tr>
<td>11. Recommended reading:</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Course title: MODEL RESEARCHES OF FISHING GEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Code: 12WNoZiR-09/10</td>
</tr>
<tr>
<td>4. Semester: summer</td>
</tr>
<tr>
<td>6. Language: English</td>
</tr>
<tr>
<td>8. Name of the lecturer:</td>
</tr>
<tr>
<td>9. Course contents:</td>
</tr>
<tr>
<td>Aim of the subject: The objective is to present applications of the fishing gears model researches to students. Model surveys enable, at reduced costs, to put technological progress into practice, making both, the competition on the fishing grounds and implementation of sustainable fishing principles, possible.</td>
</tr>
<tr>
<td>Initial requirements: mathematics, physics, fishing techniques (basic information)</td>
</tr>
<tr>
<td>Subject contents: Except for theoretical knowledge and review of the methods applied worldwide, the subject is focused on model surveys, conducted at the Model Research Station (MRS) in the Ińsko Lake. Detailed presentation of technical equipment including fishing vessel – catamaran and measurement devices, called: TRAWL system (automatic measurement of velocity, force and distance from the water surface linked with remote control and logging) and devices for underwater observations, photography, screening. The field studies at the MRS Ińsko, let students to gain practical experience on taking measures</td>
</tr>
<tr>
<td>10. Assessment methods:</td>
</tr>
<tr>
<td>11. Recommended reading:</td>
</tr>
</tbody>
</table>
with the above mentioned devices.
Besides students gain experience in:
• setting of hydrodynamic performance;
• construction improvement (trawling sets, trawl bellies, codends, devices for fish selection/ separation;
• verification of theoretical calculations;
• comparative surveys;
model scale effects (comparison of the model scale results to those at the sea with real fishing equipment).

10. Assessment methods:
11. Recommended reading:

1. Course title: **EMBRYOPHYSIOLOGY AND COMPARATIVE ANATOMY OF FISHES**

2. Code: 13WNoZR-09/10
3. ECTS points: 3
4. Semester: summer
5. Hours per week:
6. Language: English
7. Teaching method:
8. Name of the lecturer:
9. Course contents:
The subject include knowledge from ichthyology field in synthetic form, based on about some elements basic knowledge to enable practical use in future work graduate student-specialist employee in all fish section production and in scientist fish department
Initial requirements: Anatomy and embryiology of fishes, Biology of fishes, Systematics of fishes, Physiology of fishes
Subject contents: The embryophysiology refers to the most recent advances in studies on interactions and causal relationships between highly diverse environmental conditions in ecological niches selected by individual fish species as reproduction sites and morphophysiological peculiarities of early ontogenesis (embryogenesis) that ensure that the young forms obtain the best conditions for survival and preparation to independent living outside of egg membranes. That knowledge is indispensable for selection of the most appropriate reproduction methods and stocking material production with respect to most commercially valuable species and for providing those species with the best possible breeding conditions.
Methods of assessment: Estimation of work and presentation (50% estimation), estimation activity on classes (30%), estimation discipline – present on the classes and individual consultation (20% estimation concluding).

10. Assessment methods:
11. Recommended reading:

1. Course title: **ALLOCHTONOUS SPECIES OF WATER ANIMALS – INTRODUCTIONS, CURRENT STATUS, POPULATIONS DYNAMICS AND ECOLOGICAL CONSEQUENCES**

2. Code: 14WNoZR-09/10
3. ECTS points: 3
4. Semester: summer
5. Hours per week:
6. Language: English
7. Teaching method:
8. Name of the lecturer:
9. Course contents:
Aim of the subject: Students can distinguish allochthonous species, know ways of introductions, biogeography, biology of alien water animals and and ecological consequences of the introductions.
Initial requirements: Animal systematics, description, and classification of organism groups, natural distribution of water animals, biotic and abiotic factors of water
Subject contents: Module: Systematics and biology of allochthonous species in Poland. The biogeography, history and ecological consequences of the introduction of alien species in Poland, with extensive reference to other European countries. Importance of different human-mediated vectors for nonindigenous species. Population dynamics of alien species and consequences on fish and fisheries management. Native and alien water animals along the Polish Baltic sea coast, history and current status. Proportion of species with salinity and temperature preferences.

10. Assessment methods:
Test
### Recommended reading:

1. **Course title:** HYDROCHEMICAL TERMINOLOGY  
2. Code: 15WNoZIR-09/10  
3. ECTS points: 3  
4. Semester: summer  
5. Hours per week:  
6. Language: English  
7. Teaching method:  
8. Name of the lecturer:  
9. Course contents:  
   - Initial requirements: Hydrochemistry, Water protection  
10. Assessment methods:  
11. Recommended reading:  

#### GAME FISHES OF THE WORLD. ANGELSPORTLICHE FISCHARTEN IN DER WELT

1. **Course title:** GAME FISHES OF THE WORLD. ANGELSPORTLICHE FISCHARTEN IN DER WELT  
2. Code: 16WNoZIR-09/10  
3. ECTS points: 3  
4. Semester: summer  
5. Hours per week:  
6. Language: English  
7. Teaching method:  
8. Name of the lecturer:  
9. Course contents:  
   - Aim of the subject: Knowledge of game fishes of the world, arranged due to their taxonomic position and fishing-grounds, against the background of legal regulations in different countries. Initial requirements: Anatomy and embryology of fishes, Biology of fishes, Systematics of fishes  
   - Game fishes of the world will be presented, arranged due to their taxonomic position and fishing-grounds. Their latin nomenclature, English and German names, local names are provided. Main fishing-grounds and methods of angling of particular fish species are given as well. Legal regulations of angling in different countries. Rules of safe fishing  
10. Assessment methods:  
11. Recommended reading:  

#### ECO-PRODUCT DESIGN

1. **Course title:** ECO-PRODUCT DESIGN  
2. Code: 17WNoZIR-09/10  
3. ECTS points: 3  
4. Semester: winter  
5. Hours per week:  
6. Language: English  
7. Teaching method:  
8. Name of the lecturer:  
9. Course contents:  
   - Provide students with knowledge and practical skills in the scope of interdisciplinary process of product design  
   - Initial requirements: Basic knowledge in the field of economics, management, chemistry, technology and process engineering  
   - Subject contents: Lectures:  
     1. an introduction to product design (interdisciplinary process, design team, steps in design procedure, relation between product and process design)  
     2. main steps of product design procedure  
        a. identification and assessment of customer needs, converting needs to specification,
specification revision
b. development, sorting and screening the ideas for needs realization
c. selection of best ideas and risk assessment
3. technical aspects of product manufacture (reaction chemistry, product structure, specification for process design)
4. technology of product manufacture (reaction engineering, separation methods of pure product, scale-up)
5. economic concerns (evaluation of capital costs, cash flow, time to market and economic viability)
6. Tutorials:
7. converting needs to specifications and specification revising for design of: anticorrosion muffler and agent for deicing of winter roads
8. identification of concepts for high-level radioactive waste management using brainstorming method
9. development of concept-screening matrix for high-level radioactive waste management
10. risk assessment for product selection (wind power for homes, removal of water from milk at the farm)
11. development of specification for process design on the example of freon-free foam manufacture
12. investigation of economic viability of chosen project

10. Assessment methods:
11. Recommended reading:
1. Course title: **CONSTRUCTION OF SHIPS**

2. Code: 1-W-WTM-09/10  
3. ECTS points: 4  
4. Semester: winter  
5. Hours per week  
6. Language: English  
7. Teaching method:  
8. Name of the lecturer: dr Zbigniew Sekulski  
9. Course contents:
10. Assessment methods:  
11. Recommended reading:  

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1. Course title: **SHIP STRUCTURAL OPTIMIZATION**

2. Code: 2-W-WTM-09/10  
3. ECTS points: 4  
4. Semester: winter  
5. Hours per week  
6. Language: English  
7. Teaching method:  
8. Name of the lecturer: dr Zbigniew Sekulski  
9. Course contents:
10. Assessment methods:  
11. Recommended reading:  

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1. Course title: **STRENGTH OF MATERIALS**

2. Code: 3-W-WTM-09/10  
3. ECTS points: 6  
4. Semester: winter  
5. Hours per week  
6. Language: English  
7. Teaching method:  
8. Name of the lecturer: dr Maciej Taczała  
9. Course contents:
   Basic concepts of strength of materials. Experimental determination of mechanical properties of materials. Axial tension and compression, Hooke law, principle of superposition. Statically

10. Assessment methods:

11. Recommended reading:

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### Course title: **GENERAL FLUID MECHANICS**

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<thead>
<tr>
<th>2. Code: 4-W-WTM-09/10</th>
<th>3. ECTS points: 3</th>
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<tbody>
<tr>
<td>4. Semester: winter</td>
<td>5. Hours per week</td>
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<tr>
<td>6. Language: English</td>
<td>7. Teaching method:</td>
</tr>
<tr>
<td>8. Name of the lecturer: dr Tomasz Abramowski</td>
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<table>
<thead>
<tr>
<th>9. Course contents:</th>
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</table>

10. Assessment methods:

11. Recommended reading:

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### Course title: **ECONOMICS OF SHIPBUILDING**

<table>
<thead>
<tr>
<th>2. Code: 5-W-WTM-09/10</th>
<th>3. ECTS points: 3</th>
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<tbody>
<tr>
<td>4. Semester: winter</td>
<td>5. Hours per week</td>
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<tr>
<td>6. Language: English</td>
<td>7. Teaching method:</td>
</tr>
<tr>
<td>8. Name of the lecturer: dr Remigiusz Iwańkowicz</td>
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</table>

<table>
<thead>
<tr>
<th>9. Course contents:</th>
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10. Assessment methods:

11. Recommended reading:

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### Course title: **UNDERWATER TECHNOLOGY**

<table>
<thead>
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<th>2. Code: 6-W-WTM-09/10</th>
<th>3. ECTS points: 3</th>
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<tbody>
<tr>
<td>4. Semester: winter or summer</td>
<td>5. Hours per week</td>
</tr>
<tr>
<td>6. Language: English</td>
<td>7. Teaching method:</td>
</tr>
<tr>
<td>8. Name of the lecturer: dr Tadeusz Graczyk</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>9. Course contents:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classification of deep-water objects: flying, submersed, flooded and grounded structures, stationary</td>
</tr>
</tbody>
</table>

10. Assessment methods:
11. Recommended reading:

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1. Course title: **UNDERWATER TRANSPORT**

2. Code: 7-W-WTM-09/10
3. ECTS points: 3
4. Semester: **winter** or **summer**
5. Hours per week
6. Language: English
7. Teaching method:
8. Name of the lecturer: dr Tadeusz Graczyk
9. Course contents:
10. Assessment methods:
11. Recommended reading:

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**SUMMER SEMESTER**

1. Course title: **OPERATIONS RESEARCH IN PRODUCTION AND TRANSPORTATION**

2. Code: 8-W-WTM-09/10
3. ECTS points: 3
4. Semester: **summer**
5. Hours per week
6. Language: English
7. Teaching method:
8. Name of the lecturer: dr Remigiusz Iwańkowicz
9. Course contents:
10. Assessment methods:
11. Recommended reading:

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1. Course title: **CONTROL OF SHIP BUILDING PROCESS**

2. Code: 9-W-WTM-09/10
3. ECTS points: 3
4. Semester: **summer**
5. Hours per week
6. Language: English
7. Teaching method:
8. Name of the lecturer: dr Remigiusz Iwańkowicz
9. Course contents:
10. Assessment methods:
1. Course title: **SHIP HYDRODYNAMICS**

2. Code: 10-W-WTM-09/10  
3. ECTS points: 3  
4. Semester: summer  
5. Hours per week  
6. Language: English  
7. Teaching method:  
8. Name of the lecturer: dr Tomasz Abramowski  
9. Course contents:  

10. Assessment methods:  
11. Recommended reading:

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1. Course title: **COMPUTATIONAL FLUID DYNAMICS**

2. Code: 11-W-WTM-09/10  
3. ECTS points: 3  
4. Semester: summer  
5. Hours per week  
6. Language: English  
7. Teaching method:  
8. Name of the lecturer: dr Tomasz Abramowski  
9. Course contents:  

10. Assessment methods:  
11. Recommended reading:

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1. Course title: **STRUCTURAL MECHANICS**

2. Code: 12-W-WTM-09/10  
3. ECTS points: 3  
4. Semester: summer  
5. Hours per week  
6. Language: English  
7. Teaching method:  
8. Name of the lecturer: dr Maciej Taczala  
9. Course contents:  

10. Assessment methods:  
11. Recommended reading:

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1. Course title: **SHIP STRUCTURAL MECHANICS**
<table>
<thead>
<tr>
<th>Course title: <strong>SHIP HYDRODYNAMICS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Code: 14-W-WTM-09/10</td>
</tr>
<tr>
<td>4. Semester: summer</td>
</tr>
<tr>
<td>6. Language: English</td>
</tr>
<tr>
<td>8. Name of the lecturer: dr Tomasz Abramowski</td>
</tr>
</tbody>
</table>

9. Course contents:

10. Assessment methods:

11. Recommended reading:
**Course title:** CHEMICAL PROCESSES IN INORGANIC INDUSTRY AND ENVIRONMENTAL ENGINEERING I

<table>
<thead>
<tr>
<th>Code: WTIiCh/IiSi/TCh/D12-1</th>
<th>ECTS points: 4 ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester: winter</td>
<td>Hours per week: L-15, C/CC-30, Lab.-45</td>
</tr>
<tr>
<td>Name of the lecturer: prof. dr hab. inż. Maria Tomaszewska</td>
<td></td>
</tr>
</tbody>
</table>

**Course contents:**

**Programme of lectures:**


**Programme of classes:**


**Laboratory** – Unit operations and processes in inorganic chemical technology: obtaining of sodium polyphosphate from extracted phosphoric acid, obtaining of potassium sulphate (VI), obtaining of titanium dioxide with the sulphate method, ammonia synthesis over iron catalyst, obtaining of iron carbides and nitrides, photocatalytic decomposition of organic substances in the presence of titanium dioxide, water purification with the use of membrane processes.

**Assessment methods:**

11. Recommended reading:

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**Course title:** CHEMICAL PROCESSES IN INORGANIC INDUSTRY AND ENVIRONMENTAL ENGINEERING II

<table>
<thead>
<tr>
<th>Code: WTIiCh/IiSi/TCh/D12-7</th>
<th>ECTS points: 4 ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester: winter</td>
<td>Hours: L-15, C/CC-30, Lab.-45</td>
</tr>
<tr>
<td>Name of the lecturer: dr inż. Zofia Lendzion-Bieluń</td>
<td></td>
</tr>
</tbody>
</table>

**Course contents:**


**Hydrometallurgy.** Copper ores, flotation, hydrometallurgical process stages, heat pretreatment – objectives and procedures. Extraction – extraction liquor, side reaction, separation of metals from...
solutions – direct and indirect methods.

**Building materials.** Lime, gypsum, cement, concrete, prefabricated products.

**Ceramics:** ceramic building materials, electroceramics, metal ceramics, ceramic whiteware.

**Glass and glassware.** Different sorts of glass, glass wool, ceramic and glass fibres, frits.

**Electrolysis,** electrolysers, Electrochemical synthesis of sodium hypochlorite, sodium chlorate, potassium chlorate.

**Electroplating,** mechanism, structure of electrolytic coating, surface pretreatment, zinc, copper, nickel, chromium and gold plating.

**10. Assessment methods:**

**11. Recommended reading:**

### 1. Course title: COMPUTER-AIDED DESIGN OF CHEMICAL INDUSTRIAL PLANTS

<table>
<thead>
<tr>
<th>2. Code: WTiICh/ISt/TCh/D12-5</th>
<th>3. ECTS points: 3 ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Semester: winter</td>
<td>5. Hours: L-15, Lab.45</td>
</tr>
<tr>
<td>8. Name of the lecturer: prof. dr hab. Ryszard J. Kaleńczuk</td>
<td></td>
</tr>
</tbody>
</table>

### 9. Course contents:

**Programme of lectures:**
Description of the computer program for the modelling and simulation of the chemical process e.g. industrial production of acid. Structure of the program, modes of the program, Presentation of the process simulation basing on the chosen example.

**Programme of classes:**
Laboratory – Laboratory exercise with the program which simulates the industrial production of the chemical compounds. Modelling of its own industrial process. Optimization of the process parameters to get the highest product yield.

### 10. Assessment methods:

**11. Recommended reading:**

### 1. Course title: FUNDAMENTALS OF INORGANIC COMMODITY SCIENCE

<table>
<thead>
<tr>
<th>2. Code: WTiICh/ISt/TCh/D12-4</th>
<th>3. ECTS points: 2 ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Semester: winter</td>
<td>5. Hours: L-15</td>
</tr>
<tr>
<td>8. Name of the lecturer: dr inż. Krzysztof Lubkowski</td>
<td></td>
</tr>
</tbody>
</table>

### 9. Course contents:

Basic concepts in commodity science. Characteristics of raw materials and products of inorganic chemistry with regard to their physicochemical and commercial properties, obtaining and processing technology. Quality evaluation of raw materials and inorganic products in terms of their compliance with the law. Standards and laws governing the quality of inorganic products and their designation. Packing and its influence on the quality of inorganic products. Storage and transport conditions of inorganic products. Inorganic product market.

### 10. Assessment methods:

**11. Recommended reading:**
### SMALL SCALE PRODUCTS IN INORGANIC INDUSTRY

- **Course title:** SMALL SCALE PRODUCTS IN INORGANIC INDUSTRY
- **Code:** WTiICh/IISt/TCh/D6-9
- **ECTS points:** 2 ECTS
- **Semester:** winter
- **Language:** English
- **Teaching method:** L
- **Name of the lecturer:** dr inż. Krzysztof Lubkowski
- **Course contents:** Inorganic pigments, sorbents, fillers, coagulants, silicon emulsions, silicon pastes, inorganic phosphorous compounds - characteristics, properties, methods of production, application.

**Recommended reading:**

### TECHNOLOGIES FOR WASTE AND POLLUTANTS MINIMIZATION IN CHEMICAL INDUSTRY

- **Course title:** TECHNOLOGIES FOR WASTE AND POLLUTANTS MINIMIZATION IN CHEMICAL INDUSTRY
- **Code:** WTiICh/IISt/TCh/D12-2
- **ECTS points:** 2 ECTS
- **Semester:** winter
- **Language:** English
- **Teaching method:** L
- **Name of the lecturer:** Joanna Grzechulska – Damszel PhD
- **Course contents:** European regulations concerning waste management. Environmental impact assessment. Life cycle analysis. Responsible Care Program. The concept of cleaner production. Techniques of waste and pollutants minimization. Case studies – examples from industry.

**Recommended reading:**
- Obligatory
- Additional/optional

### TESTING METHODS OF INORGANIC PRODUCTS

- **Course title:** TESTING METHODS OF INORGANIC PRODUCTS
- **Code:** WTiICh/IISt/TCh/D12-3
- **ECTS points:** 5 ECTS
- **Semester:** winter
- **Hours:** L-45, Lab.-60
6. Language: English  

8. Name of the lecturer: dr inż. Dariusz Moszyński

9. Course contents:
Programme of lectures:
Examples of applications of the above mentioned methods for testing of inorganic products.
Programme of classes:
Laboratory: Analytical methods such as ICP, AAS, XRF, ESCA, SEM, XRD, IR, TG, TPR.

10. Assessment methods:

11. Recommended reading:
### POWER ENGINEERING IN CHEMICAL INDUSTRY

1. **Course title:** POWER ENGINEERING IN CHEMICAL INDUSTRY  
2. **Code:** WTiICh/IISt/TCh/D12-8  
3. **ECTS points:** 2 ECTS  
4. **Semester:** summer  
5. **Hours:** L-15  
6. **Language:** English  
7. **Teaching method:** L  
8. **Name of the lecturer:** dr hab. inż. Marek Gryta  
9. **Course contents:**  
   - Characteristics of basic methods of energy transfer. Characterisation of the types of energy used in chemical industry. Natural resources of raw materials used by chemical industry. Power demand of the major unit operation. Principles of management of heat and cold in the production processes.  
10. **Assessment methods:**  
11. **Recommended reading:**  
   - **Obligatory**  
   - **Additional/optional**  

### QUALITY AND RISK MANAGEMENT IN CHEMICAL INDUSTRY

1. **Course title:** QUALITY AND RISK MANAGEMENT IN CHEMICAL INDUSTRY  
2. **Code:** WTiICh/IISt/TCh/D12-11  
3. **ECTS points:** 2 ECTS  
4. **Semester:** summer  
5. **Hours:** L-15  
6. **Language:** English  
7. **Teaching method:** L  
8. **Name of the lecturer:** dr inż. Krzysztof Karakulski  
9. **Course contents:**  
10. **Assessment methods:**  
11. **Recommended reading:**  
1. Course title: NANOTECHNOLOGY AND CRYSTALLINE NANOMATERIALS

2. Code: WTiICh/IISt/TCh/D12-10
3. ECTS points: 2 ECTS

4. Semester: summer
5. Hours: L-15

6. Language: English
7. Teaching method: L

8. Name of the lecturer: dr Ewa Borowiak-Pałęń

9. Course contents:

10. Assessment methods:

11. Recommended reading:
IV. Useful information

1. About Szczecin

Szczecin lies in north-west Poland at the German-Polish border. City lies over river Odra and lake Dąbie. Extended economy with the participation of different branches of industry, causes that Szczecin is a main economic centre of the region. A sea economy is characteristic of the city among others – Szczecin has a big seaport and a shipyard. The city is a tourist centre, with the substantial amount of monuments. He constitutes the cultural centre - numerous theatres, museums and community centres.

In brief

Population: 407,260
Telephone code for Poland: + 48
Szczecin telephone area code: 0 – 91
Local transport: trams, buses, taxis

2. Getting to Szczecin

Thanks to its location in the north-west corner of Poland, a few kilometres form the Polish-German border and ca. 100 km from the Baltic Sea ferry terminals, Szczecin is an easy target.

Traveling by plane:

- arrival in Berlin (international airports Tegel or Schönefeld; ca. 150 km form Szczecin). It is possible to get from Berlin airports directly to Szczecin by mini bus service – all the details of some local mini bus companies please see below:

**INTERGLOBUS TOUR**  
[http://www.interglobus.pl/](http://www.interglobus.pl/)  
tel.: + 48 91 485 04 22  
mobile: + 48 608 330 233  
e-mail: biuro@interglobus.pl  
- possible ticket reservation from abroad (one-way ticket : ca. 72 PLN, return ticket: ca. 100 PLN)

**BERLINIA – ATLAS TRANSFER**  
[http://www.berlinia.eu/](http://www.berlinia.eu/)  
tel.: + 48 91 433 44 44  
fax.: + 48 91 483 56 53  
e-mail: info@berlinia.eu  
rezerwacje@berlinia.eu  
biuro@berlinia.eu

- arrival in Warsaw (an international airport Warszawa – Okęcie, ca. 520 km from Szczecin), direct IC trains to Szczecin from Warsaw Train Station
• arrival at Goleniów airport (a regional airport ca. 40 km from Szczecin), shuttle bus service from the airport to the centre of Szczecin

Travelling by train:
The arrival station: SZCZECIN GŁÓWNY (main station)

• IC, EC connections from Warsaw (Warsaw Central – Warszawa Centralna)
• direct connections from Gdańsk and Świnoujście (ferry terminals)
• connections from Berlin

3. Accommodation

The West Pomeranian University of Technology guarantees accommodation in its dormitories for all incoming Erasmus students who have met the indicated deadlines for submitting the reservation for accommodation (30 June – autumn semester and full academic year, 30 November – spring semester)

There are mostly double rooms available. However, a room is usually used as single for Erasmus exchange students. The price of the room is 450 PLN (ca. 115 euro) per month.

If you plan to arrive in Szczecin well before October 1st and February 15th, please notify the International Office in due time.

Incoming students can also rent a room or a flat on their own. Check out notice boards at the faculties informing about possible room or flat rentals, also check http://www.infoludek.pl/.

4. Libraries

West Pomeranian University of Technology has two main libraries.

First of them offers students an extensive collection of books on agriculture, ecology, environmental protection, biology, biotechnology, etc. The library network connects 40 computers to enable all readers to have a good access to the program.

Contact:
ul. Janosika 8, 71-424 Szczecin
tel./fax: [+48] 091 4496100
e-mail: bgzp@zut.edu.pl
http://www.libra.ar.szczecin.pl
Second library covers civil engineering and architecture, urban planning, electrical engineering, mechanical engineering, marine technology, chemical engineering, etc. The collection consists of 280,000 books. A major part of collection is available in reference rooms. The library has a central computer system for collection, analysis and retrieving for information. Every registered student may use the institute, faculty and general libraries.

Contact:
Biblioteka Główna
Ul. Puławskiego 10, 70-322 Szczecin
Tel./fax.: +48 91 433 65 04, +48 91 449 49 90
http://www.bg.zut.edu.pl/

5. Medical insurance and service

Students from EU/EEA countries are entitled to medical services on the basis of the European Health Insurance Card (EHIC) or its equivalent. The card should be obtained form students’ national health services before their departure for Poland.

For further information see http://www.nfz.gov.pl/new/ (access to health care during a temporary stay in Poland).

Erasmus exchange students are advised to consult doctors at the medical centre of the West Pomeranian University of Technology:

Poradnia Ogólna (general practitioners)
ul. Bohaterów Warszawy 51, 70-342 Szczecin
tel. + 48 91 449 44 22, + 48 91 449 45 34

Międzyuczelniana Poradnia Specjalistyczna
al. Wojska Polskiego 97, 70-481 Szczecin
tel.: + 48 91 422 12 45, + 48 91 422 12 87

Apart from EHIC it is advisable to carry also emergency travel insurance purchased before the arrival.

Students from non EU/EEA countries are advised to purchase health insurance in Poland immediately after their arrival (it is suggested that travel insurance should cover the travel and initial stay). All information can be found at:

Zachodniopomorski Oddział Wojewódzki NFZ
(West Pomeranian branch of the National Health Fund)
ul. Arkońska 45, 71-470 Szczecin
tel.: + 48 91 425 10 00
fax.: + 48 91 425 11 88
e-mail: wf16@nfz.gov.pl
6. Transport – how to move around

Szczecin is split in two parts (Lewobrzeże and Prawobrzeże) named after their location on banks of Oder (Lewobrzeże = left bank) and Regalica (Prawobrzeże = right bank) rivers. The port is situated in between. City centre and most of attractions are situated in Lewobrzeże.

The best way to move around in Szczecin is by car. If you don not own one you can use public transport – bus and tram service. Public transport in Szczecin has its time tickets. The prices are as followed:

- single up to 20 minutes ticket – 1,10 PLN
- single up to 60 minutes ticket – 1,70 PLN

Tickets can be bought at newspaper stands/shops situated on every corner and from the driver (after 6 p.m.).

Remember to stamp your ticket immediately after you board the tram/bus!

Public transport operates from early morning (5 a.m.) to 11 p.m. Detailed information and current timetables can be found at: [http://www.zditm.szczecin.pl/](http://www.zditm.szczecin.pl/)

If you want to rent a car please visit companies mentioned below:

**Auto 29**
ul. Pocztowa 31-33, 70-360 Szczecin  
tel.: + 48 601 29 29 29, 601 613 211, 601 703 905  
fax.: + 48 91 484 59 25  
[http://auto29.pl/](http://auto29.pl/)

**Avis**
Hotel Radisson SAS  
pl. Rodła 10, 70-419 Szczecin  
tel.: + 48 91 35 95 127  
mobile: + 48 601 354 810  
e-mail: szczecin@avis.pl  
[http://avis.pl/](http://avis.pl/)

Also you can use taxi service. Below you will find the most popular companies in Szczecin:

**Gold Taxi**

**City Taxi**
tel.: + 48 91 96 60  
tel.: + 48 91 433 53 35  
tel.: + 48 91 434 33 33

**Lux Taxi**
tel.: + 48 91 96 68  
tel.: + 48 91 448 04 80  
tel.: + 48 608 33 53 35

7. Telephones and post offices

Public telephones require special tokens or magnetic cards that can be purchased at post offices or newspaper stands.

**Emergency telephones:**

- Police 997
- Fire Department 998
- Ambulance 999
- Emergency phone in mobile systems 112
Post offices offer a wide range of service. You can buy there post stamps, postcards, telephone cards and also send telegrams or fax. Post offices are usually open from Monday to Friday 8 a.m. till 7 p.m. and selected ones on Saturday.

8. **Entertainment**

**Cinemas**

All information about current repertoire of cinemas in Szczecin can be found on:

- **Multikino Szczecin**

- **Helios Szczecin**

- **Pionier 1909**

**Theatres**

- **Opera na Zamku**
  ul. Korsarzy 34, 70-540 Szczecin

- **Teatr Polski**
  ul. Swarożyca 5, 71-601 Szczecin

- **Teatr Współczesny**
  ul. Wały Chrobrego 3, 70-500 Szczecin

- **Teatr Kameralny**
  ul. Plac Żołnierza 5/6, 70-205 Szczecin

**Art galleries and museums**

- **Muzeum Narodowe**
  ul. Staromłyńska 27, 71-561 Szczecin
  [http://www.muzeum.szczecin.pl/](http://www.muzeum.szczecin.pl/)

- **Galeria Sztuki Współczesnej**
  ul. Staromłyńska 1
  70-561 Szczecin
  tel. (0-91) 431-52-36

- **Muzeum Zamku Książąt Pomorskich**
  ul. Korsarzy 34
  70-540 Szczecin
  tel. (0-91) 489-16-30
  fax (0-91) 434-79-84
  e-mail: cikit@zamek.szczecin.pl

**Major cultural events in Szczecin are:**

- Days of the Sea (Polish *Dni Morza*) held every June.
- Street Artists' Festival (Polish *Festiwal Artystów Ulicy*) held every July.
- Days of The Ukrainian Culture (Polish *Dni Kultury Ukraińskiej*) held every May.
- Air show on Dabie airport held every May.
9. **Sport activities**

### Fitness

- **Fitness Club Szczecin**  
  ul. Monte Casino 24, Szczecin  
  [http://www.fitnessclub.szczecin.pl/start.html](http://www.fitnessclub.szczecin.pl/start.html)

- **Universum Fitness Club**  
  Al. Wojska Polskiego 39a, Szczecin  
  [http://www.fitnessuniversum.pl/](http://www.fitnessuniversum.pl/)

- **CSR ACTIVE FILIA CHR KUPIEC**  
  ul. Krzywoustego 9-10, 70-250 Szczecin  
  [http://www.active-fitness.pl/](http://www.active-fitness.pl/)

- **Planet Spa**  
  al. Wojska Polskiego 70,  
  [http://www.planetspa.szczecin.pl/](http://www.planetspa.szczecin.pl/)

### Yoga

- **Szkoła Jogi Klasycznej**  
  ul. Niedziałańskiego 26a (vis-a-vis TVP Szczecin), 71-410 Szczecin  
  [http://www.jogaklasyczna.pl/](http://www.jogaklasyczna.pl/)

- **Szkoła Jogi Jurka i Aly Jaguckich**  
  ul. Bogusława 3 deptak, III piętro 70-440 Szczecin  
  [http://www.yoga.szczecin.pl/](http://www.yoga.szczecin.pl/)

### Tennis

- **Szczeeciński Klub Tenisowy**  
  al. Wojska Polskiego 127  
  70-490 Szczecin  
  tel. (0-91) 422-00-49  
  fax. (0-91) 422-42-2  
  [http://www.promasters.pl/](http://www.promasters.pl/)

### Swimming

- **Szczeeciński Dom Sportu**  
  ul. Wąska 16  
  tel. 0-91 422-29-17

- **Pływalnia Wyższej Szkoły Morskiej**  
  ul. Starzyńskiego 9a  
  tel. 0-91 448-03-55

- **Szkoła Podstawowa nr 51**  
  ul. Jodłowa 21 (Os. Kaliny)  
  tel. 0-91 452-33-24

- **Zespół Szkół Ogólnokształcących nr 8**  
  ul. Rydla 49 (Oś. Słoneczne)  
  tel. 0-91 462-84-00

- **Zespół Szkół Ogólnokształcących nr 3**  
  ul. Orawska 1 (Pomorzan)  
  tel. 0-91 482-64-79

- **Basen w I Liceum Ogólnokształcącym**  
  al. Piastów 12 Szczecin  
  tel. 0-91 484-63-85

### Dancing

- **Estilo Dance Studio**  
  ul. Kręta 38A  
  71-052 Szczecin  
  [http://www.estilostudio.pl/](http://www.estilostudio.pl/)

- **DK Dance**  
  [http://www.dkdance.pl/](http://www.dkdance.pl/)

- **Quiero Salsa**  
  [http://www.quierosalsa.pl/](http://www.quierosalsa.pl/)

- **ALMA Flamenco**  
10. Night life

City Hall
http://www.cityhall.pl/

Baila Club
http://www.baila.pl/

Can Can Club
http://www.cancan.pl/

Club 77
http://www.club77.pl/

Intro Club
http://www.clubintro.pl/

Rocker Club
http://www.rockerclub.pl/

11. Tourist information

Centre of the Tourist Information
al. Niepodległości 1a, 70-206 Szczecin
tel.: + 48 91 434 04 40
fax.: + 48 91 433 84 20
e-mail: cit.szczecin@wp.pl
http://www.mosrir.szczecin.pl/cit/cit.php

Cultural and Tourist Information Centre
ul. Korsarzy 34, 70-540 Szczecin
tel.: + 48 91 489 16 30
fax.: + 48 91 434 02 86
e-mail: cikit@zamek.szczecin.pl
http://www.zamek.szczecin.pl/tourism/

12. Worth seeing in Szczecin

- Zamek Książąt Pomorskich
  – The Pomeranian Dukes Castle
  http://www.zamek.szczecin.pl/
- Wały Chrobrego
- Brama Portowa
- Brama Królewskas
- Cmentarz Centralny
- Stare Miasto – Old Town
- Park Kasprowicza – Kasprowicz’s Park with Pope Statue

13. Szczecin in the internet

For all the Szczecin cultural information please go to:

http://www.infoludek.pl/
http://www.echo.szczecin.pl/
http://www.eszczecin.pl/
http://www.mmszczecin.pl/
V. Contact information

1. Authorities

Rector's Office
West Pomeranian University of Technology, Szczecin
al. Piastów 17, 70-310 Szczecin, Poland
http://www.zut.edu.pl/

Rector
prof. dr hab. inż. Włodzimierz Kiernożycki

tel: + 48 91 434 67 51, + 48 91 449 40 15
fax: +48 91 449 40 14
e-mail: rektor@zut.edu.pl

Pro-rector for Educational Matters

dr hab. inż. Witold Biedunkiewicz, prof. nadzw. ZUT

tel.: + 48 91 449 47 17, + 48 91 449 43 39
fax.: + 48 091 449 41 87
e-mail: dzial.ksztalcenia@zut.edu.pl

Pro-rector for Scientific Research

prof. dr hab. inż. Ryszard Kaleńczuk

tel.: + 48 91 449 41 39
fax.: + 48 91 449 46 21
e-mail: dzial.nauki@zut.edu.pl

Pro-rector for Student’s Affairs

dr hab. Jacek Wróbel

tel.: + 48 91 449 43 59
e-mail: dzial.student@zut.edu.pl

Pro-rector for Organisation and Development

prof. dr hab. inż. Jan B. Dawidowski

tel.: + 48 91 449 6050
fax.: + 48 91 449 6056
e-mail: pro_o@zut.edu.pl
2. Academic Divisions

Faculty of Civil Engineering and Architecture
Dean: dr hab. inż. Halina Garbalińska, prof. ZUT
al. Piastów 50, 70-311 Szczecin
tel.: + 48 91 434 79 90
fax.: + 48 91 449 42 25
http://www.wbia.zut.edu.pl/

Faculty Erasmus Coordinator
dr Andrzej Pozlewicz
E-mail: andpoz@zut.edu.pl
Al. Piastów 50, 70-311 Szczecin
Tel.: +48 91 449 42 01, fax.: +48 91 449 42 25

Faculty of Biotechnology and Animal Husbandry
Dean: prof. dr hab. Jan Udała
ul. Doktora Judyma 2-26, 71-466 Szczecin
tel.: +48 91 449 67 52
fax.: +48 91 454 16 42
http://www.biot.zut.edu.pl/

Faculty Erasmus Coordinator
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