

LLP ERASMUS

na

Zachodniopomorskim Uniwersytecie Technologicznym
w Szczecinie

LLP ERASMUS

at

West Pomeranian University of Technology
Szczecin



Szczecin 2009

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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

Wydział
Biotechnologii
i Hodowli Zwierząt

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 15 departments. From 1969 the Faculty Has had the Wright to grant doctor degree 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, agro-tourism

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



Wydział
Budownictwa
i Architektury

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 student 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.
-



Wydział
Elektryczny

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.
-



Wydział
Ekonomiczny

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.
-



Wydział
Informatyki

Faculty of Computer Science and Information Technology

The history of the Faculty goes back to the year 1971 when the Faculty 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.
-



Wydział
Inżynierii Mechanicznej
i Mechatroniki

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**
-



Wydział
Kształtowania
Środowiska i Rolnictwa **Faculty of Environmental Management and Agriculture**

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.
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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.



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 followed:

- 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 PROGRAMME
West Pomeranian University of Technology, Szczecin
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International Cooperation
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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 your departure,
- **Learning Agreement** - agreed upon with home and host coordinator.

The application deadlines are as follows:

- **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

Faculty of Biotechnology and Animal Husbandry Courses:				
Code:	Subject:	ECTS	semester	Page no.
1-WBiHZ-09/10	FUNDAMENTALS OF LABORATORY DIAGNOSTIC	6	winter	18
2-WBiHZ-09/10	ELEMENTS OF PARASITOLOGY	5	winter	18
3-WBiHZ-09/10	BIOLOGY OF THE HONEYBEE COLONY	4	winter	18
4-WBiHZ-09/10	HUMAN NUTRITION AND NATURAL FOOD INGREDIENTS	5	winter	19
5-WBiHZ-09/10	PROTEOMICS	6	winter	19
6-WBiHZ-09/10	Основные исследования в области лабораторной диагностики	4	winter	20
7-WBiHZ-09/10	Ветеринарная паразитология и профилактика	4	winter	20
8-WBiHZ-09/10	Раціональне харчування тварин	4	winter	20
9- WBiHZ-09/10	BIOTECHNIK DER FORTPFLANZUNG DER TIERE	6	winter	20
10- WBiHZ-09/10	IMKELICHE GRUNDLAGE	4	winter	21
11-WBiHZ-09/10	ALLGEMEINE GRUNDLAGEN DER PHYSIOLOGIE DERNHAUSTIEREN	6	winter	21
12- WBiHZ-09/10	PROTOMIKA	6	winter	22
13- WBiHZ-09/10	BEEKEEPING IN THE PAST AND PRESENTS	4	summer	22
14- WBiHZ-09/10	BIOTECHNOLOGY AND GENETIC ENGINEERING	6	summer	22
15- WBiHZ-09/10	GENETIC AND GENOMIC	6	summer	22
15- WBiHZ-09/10	KORUNG DER BIENEN	4	summer	22

Faculty of Civil Engineering and Architecture

Faculty of Civil Engineering and Architecture Courses:				
Code:	Subject:	ECTS	semester	Page no.
Architecture and Urban Courses:				
AiU/MGR/B2	ARCHITECTURAL DESIGN 1	3	winter	23
AiU/MGR/B3	ARCHITECTURAL DESIGN 2	4	winter	23
AiU/MGR/A5	ARCHITECTONIC AND URBAN MODELING	1	winter	24
AiU/MGR/A4	COMPUTER DESIGN CAD	1	winter	24
AiU/MGR/B7	HISTORY OF THE CONTEMPORARY ARCHITECTURE AND URBAN PLANNING	1	winter	24
AiU/MGR/B8.2	SPECIALISTIC ARCHITECTURAL DESIGN	10	winter	25
AiU/MGR/B8.3	PUBLIC ARCHITECTURAL DESIGN	10	winter	25
AiU/MGR/B8.2	ARCHITECTURAL DESIGN 1 (SUSTAINABLE DESIGN)	3	summer	26
AiU/MGR/B6	LANDSCAPE DESIGNING	2	summer	26
AiU/MGR/B8.2	SPECIALISTIC ARCHITECTURAL DESIGN	10	summer	27
AiU/MGR/B8.3	PUBLIC ARCHITECTURAL DESIGN	10	summer	27
AiU/MGR/C1	PRE - DIPLOMA DESIGN	2	summer	27
Civil Engineering Courses:				
B/S1/OiZI-/37	CONSTRUCTION EKONOMICS	3	winter	28
B/S1/OiZI-/39-1	PROJECT MANAGEMENT 1	4	winter	28

B/S1/OiZJ-/45	CONSTRUCTION SITE MANAGEMENT I	5	winter	29
B/S1/OiZJ-/46	CONTRACT PROCEDURES	5	winter	29
B/S1/OiZJ-/47	QUALITY MANAGEMENT SYSTEMS	4	winter	29
B/S1/OiZJ-/48	FINANCES AND ACCOUNTANCY I	5	winter	30
B/S1/OiZJ-/49	ANALYSIS OF PROJECT EFFICIENCY	5	winter	30
B/S1/OiZJ-/50	ENVIRONMENTAL GEOTECHNOLOGY	3	winter	30
B/S1/OiZJ-/51	HYDROGEOLOGY	3	winter	31
B/S1/OiZJ-/67	POLISH LANGUAGE AND CULTURE	4	winter or summer	31
B/S1/OiZJ-/52	NEW GENERATION OF CONCRETE	3	summer	32
B/S1/OiZJ-/53	DURABILITY OF CONCRETE	3	summer	32
B/S1/OiZJ-/54	TECHNOLOGY OF STEEL STRUCTURES	3	summer	33
B/S1/OiZJ-/55	INDUSTRIAL STEEL STRUCTURES	3	summer	33
B/S1/OiZJ-/56	TECHNOLOGY OF FOUNDATION WORKS	3	summer	34
B/S1/OiZJ-/57	GEOENGINEERING	3	summer	34
B/S1/OiZJ-/58	TECHNOLOGY OF REGULATION WORKS	3	summer	35
B/S1/OiZJ-/59	SPECIAL CONSTRUCTIONS TECHNOLOGY IN HYDROENGINEERING	3	summer	35
B/S1/OiZJ-/60	SITE MANAGEMENT II	3	summer	35
B/S1/OiZJ-/61	ORGANIZATION OF CONSTRUCTION ENTERPRISES II	3	summer	36
B/S1/OiZJ-/61	FINANCES AND ACCOUNTANCY II	3	summer	36
B/S1/OiZJ-/63	BUILDING PHYSICS II	3	summer	36
B/S1/OiZJ-/64	COMPOSITE CONSTRUCTIONS	3	summer	37
B/S1/OiZJ-/39-2	PROJECT MANAGEMENT 2	6	summer	37
B/S1/OiZJ-/2	CONSTRUCTION LAW	4	summer	38

Faculty of Computer Science and Information Technology

Faculty of Computer Science and Information Technology Courses:

Code:	Subject:	ECTS	semester	Page no.
1-WI-09/10	DIGITAL IMAGE PROCESSING	4	winter	39
2-WI-09/10	TELEINFORMATION NETWORK	5	winter	39

Faculty of Chemical Engineering

Faculty of Chemical Engineering Courses:

Code:	Subject:	ECTS	semester	Page no.
WTiCh/IISt/TCh/D12-1	CHEMICAL PROCESSES IN INORGANIC INDUSTRY AND ENVIRONMENTAL ENGINEERING I	4	winter	65
WTiCh/IISt/TCh/D12-7	CHEMICAL PROCESSES IN INORGANIC INDUSTRY AND ENVIRONMENTAL ENGINEERING II	4	winter	65
WTiCh/IISt/TCh/D12-5	COMPUTER-AIDED DESIGN OF CHEMICAL INDUSTRIAL PLANTS	3	winter	66
WTiCh/IISt/TCh-D12-4	FUNDAMENTALS OF INORGANIC COMMODITY SCIENCE	2	winter	66
WTiCh/IISt/TCh/D6-9	SMALL SCALE PRODUCTS IN INORGANIC INDUSTRY	2	winter	67
WTiCh/IISt/TCh/D12-2	TECHNOLOGIES FOR WASTE AND POLLUTANTS MINIMIZATION IN CHEMICAL INDUSTRY	2	winter	67
WTiCh/IISt/TCh/D12-3	TESTING METHODS OF INORGANIC PRODUCTS	5	winter	67
WTiCh/IISt/TCh/D12-6	TECHNOLOGICAL PROJECT	2	winter	68
WTiCh/IISt/TCh/D12-8	POWER ENGINEERING IN CHEMICAL INDUSTRY	2	summer	69
WTiCh/IISt/TCh/D12-11	QUALITY AND RISK MANAGEMENT IN CHEMICAL	2	summer	69

	INDUSTRY			
WTiCh/IISt/TCh/D12-10	NANOTECHNOLOGY AND CRYSTALLINE NANOMATERIALS	2	summer	70

Faculty of Environmental Management and Agriculture

Faculty of Environmental Management and Agriculture Courses:				
Code:	Subject:	ECTS	semester	Page no.
1-WKSiR-09/10	NUTZPFLANZEN DER TROPEN UND SUBTROPEN	6	winter	47
2- WKSiR-09/10	PROÖKOLOGISCHE ANBAUVERFAHREN IN PFLANZENBAU	6	winter	47
3- WKSiR-09/10	ANBAUTECHNOLOGY VON INDUSTRIEPFLANZEN	6	winter	47
4- WKSIR-09/10	ANBAU VON ALTERNATIVPFLANZEN	6	summer	48
5-WKSiR-09/10	TYPENBESCHREIBUNG UND KARTIERUNG VON WALDSTANDORTEN	2	summer	48
6- WKSIR-09/10	ANBAUTECHNOLOGIE VON GETREIDE UND SCHMETTERLINGSGSBÜTLER	6	summer	48
7- WKSIR-09/10	BIOTECHNOLOGY IN AGRICULTURE	6	summer	49
8-WKSiR-09/10	CHARACTERIZATION OF SELECTED HORTICULTURAL CROPS	2	summer	49
9- WKSiR-09/10	BIOLOGICAL PROTECTION OF PATHOGENS	6	summer	49
10-WKSiR-09/10	SOIL TILLAGE IN SUSTAINABLE AGRICULTURE –	5	summer	49
11- WKSIR-09/10	THE PRINCIPALS OF GOLF COURSES CONSTRUCTION	5	summer	50
12-WKSiR-09/10	THE BIOMASS PRODUCTION ON ARABLE LANDS	5	summer	50
13- WKSIR-09/10	FLORICULTURE PRODUCTION – CUT FLOWERS	3	summer	51

Faculty of Food Science and Fisheries

Food Technology and Human Nutrition Courses:				
Code:	Subject:	ECTS	semester	Page no.
1WNoŽiR-09/10	NUTRITION IN DIFFERENT PHYSIOLOGICAL STATES	5	winter	52
2WNoŽiR-09/10	ERNÄHRUNGSSYSTEME UND DIÄTEN - PHYSIOLOGISCHE ASPEKTE	5	winter	52
3WNoŽiR-09/10	HYGIENE IN FOOD INDUSTRY	5	winter	53
4WNoŽiR-09/10	PESTS IN FOOD INDUSTRY AND THEIR CONTROL	5	winter	53
5WNoŽiR-09/10	SELECTED TOXICOLOGY PARTS	4	summer	53
6WNoŽiR-09/10	DAIRY TECHNOLOGY	8	summer	54
7WNoŽiR-09/10	FOOD TOXICOLOGY AND ITEMS OF COMMON USE	6	summer	54
Fisheries Courses:				
8WNoŽiR-09/10	CHEMICAL MONITORING IN THE ENVIRONMENTAL	3	winter	55
9WNoŽiR-09/10	TOKSYKOLOGY AND FODDERS HIGIENE IN PISCICULTURE	3	winter	55
10WNoŽiR-09/10	TOKSYKOLOGY AND FODDERS HIGIENE IN PISCICULTURE	3	summer	55
11WNoŽiR-09/10	CELL BIOLOGY	3	summer	56
12WNoŽiR-09/10	MODEL RESEARCHES OF FISHING GEARS	3	summer	56
13WNoŽiR-09/10	EMBRYOPHYSIOLOGY AND COMPARATIVE ANATOMY OF FISHES	3	summer	57
14WNoŽiR-09/10	ALLOCHTONOUS SPECIES OF WATER ANIMALS – INTRODUCTIONS, CURENT STATUS, POPULATIONS DYNAMICS AND ECOLOGICAL CONSEQUENCES	3	summer	57

15WNoŽiR-09/10	HYDROCHEMICAL TERMINOLOGY	3	summer	58
16WNoŽiR-09/10	GAME FISHES OF THE WORLD. ANGELSPORTLICHE FISCHARTEN IN DER WELT	3	summer	58
17WNoŽiR-09/10	ECO-PRODUCT DESIGN	3	summer	58

Faculty of Maritime Engineering

Faculty of Maritime Engineering Courses:

Code:	Subject:	ECTS	semester	Page no.
1W-WTM-09/10	CONSTRUCTION OF SHIPS	4	winter	60
2W-WTM-09/10	SHIP STRUCTURAL OPTIMALIZATION	4	winter	60
3W-WTM-09/10	STRENGTH OF MATERIALS	6	winter	60
4W-WTM-09/10	GENERAL FLUID MECHANICS	3	winter	61
5W-WTM-09/10	ECONOMICS OF SHIPBUILDING	3	winter	61
6W-WTM-09/10	UNDERWATER TECHNOLOGY	3	winter or summer	61
7W-WTM-09/10	UNDERWATER TRANSPORT	3	winter or summer	62
8S-WTM-09/10	OPERATIONS RESEARCH IN PRODUCTION AND TRANSPORTATION	3	summer	62
9S-WTM-09/10	CONTROL OF SHIP BUILDING PROCESS	3	summer	62
10S-WTM-09/10	SHIP HYDRODYNAMICS	3	summer	63
11S-WTM-09/10	COMPUTATIONAL FLUID DYNAMICS	3	summer	63
12S-WTM-09/10	STRUCTURAL MECHANICS	3	summer	63
13S-WTM-09/10	SHIP STRUCTURAL MECHANICS	4	summer	64
14S-WTM-09/10	SHIP HYDRODYNAMICS	4	summer	64

Faculty of Mechanical Engineering and Mechatronics

Faculty of Mechanical Engineering and Mechatronics Courses:

Code:	Subject:	ECTS	semester	Page no.
Material Science Courses:				
WINTER SEMESTER		30		
1W-WiMiM-09/10	FUNDAMENTAL OF MATERIALS SCIENCE	4	winter	40
2W-WiMiM-09/10	METALLIC MATERIALS	4	winter	40
3W-WiMiM-09/10	CERAMICS	4	winter	40
4W-WiMiM-09/10	POLYMER MATERIALS II	4	winter	40
5W-WiMiM-09/10	METAL AND CERAMIC COMPOSITES	3	winter	41
6W-WiMiM-09/10	METHODS AND TECHNIQUES OF MATERIALS TESTING	4	winter	41
7W-WiMiM-09/10	POLYMER PROCESSING I	4	winter	41
8W-WiMiM-09/10	SURFACE ENGINEERING	3	winter	41
SUMMER SEMESTER		30		
9S-WiMiM-09/10	POLYMER MATERIALS III	5	summer	42
10S-WiMiM-09/10	POLIMER PROCESSING II	5	summer	42
11S-WiMiM-09/10	COMPOSITES II	4	summer	42
12S-WiMiM-09/10	RECYCLING I	2	summer	42
13S-WiMiM-09/10	PACKAGING I	1	summer	43
14S-WiMiM-09/10	FUNCTIONAL MATERIALS	4	summer	43
15S-WiMiM-09/10	NANOMATERIALS	3	summer	43
16S-WiMiM-09/10	BIOMATERIALS	3	summer	43

17S-WIMiM-09/10	CORROSION PROTECTION	3	summer	44
Department of Thermal Technology courses:				
18-WIMIM-09/10	ENERGY MANAGEMENT	4		44
19-WIMIM-09/10	MODERN POWER SYSTEMS	4		44
20-WIMIM-09/10	ENVIRONMENTAL MANAGEMENT IN ENERGY SECTOR	4		44
21-WIMIM-09/10	RENEWABLE ENERGY SOURCES	4		44
22-WIMIM-09/10	FUELS AND COMBUSTION TECHNOLOGIES	3		45
23-WIMIM-09/10	HEAT TRANSFER	4		45
24-WIMIM-09/10	THERMODYNAMICS	4		46
25-WIMIM-09/10	STEAM AND GAS TURBINE	3		46

2. Detailed description of courses



Wydział
Biotechnologii
i Hodowli Zwierząt

Faculty of Biotechnology and Animal Husbandry

📅 WINTER SEMESTER

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] - Cryptosporidium detection methods. Zielh-Nielsen staining method: preparation and microscopic examination. Cryptosporidium immunochromatographic test. [2 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] Diagnostic parasitology – classical (coproscopy and larvascopy methods), molecular methods – ELISA test, PCR, electrophoresis). [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

4. Semester: winter	5. Hours per week
6. Language: English	7. Teaching method:
8. Name of the lecturer: mgr. inż. Piotr Rostecki	
9. Course contents:	
10. Assessment methods:	
11. Recommended reading:	

1.Course title: HUMAN NUTRITION AND NATURAL FOOD INGREDIENTS	
2. Code: 4E-WBiHZ-09/10	3. ECTS points: 5
4. Semester: winter	5. Hours: 30
6. Language: English	7. Teaching method: L 10, T20
8. Name of the lecturer: dr inż. Wioletta Biel, dr inż. Agnieszka Kowieska	
9. Course contents: Structure and chemical composition of foods. The role of water as a food ingredient. The role and chemical analysis of basic nutrients (dry weight - water, crude ash, crude fat, crude fiber, crude protein, N-free extract). The role of dietary fiber and its soluble and insoluble fractions influence on the gastrointestinal tract of man and animals, and analysis of all fractions of dietary fiber. Nutritional evaluation of main food groups. Food guide pyramid. Nutritive Value of Foods. Digestibility, digestion coefficient. Digestibility in vitro of nutrients (for example – fat, protein, carbohydrate). Protein characterization. Biological value of a protein, Essential and Limiting Amino Acids. Use of standards. Protein Calorie Interaction.	
10. Assessment methods:	
11. Recommended reading:	

1.Course title: PROTEOMICS	
2. Code: 5E-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. Katarzyna Michałek	
9. Course contents: Introduction to proteomics Genome, transcriptome, proteome. Biological significance of post-transcriptional and post-translational protein modifications. Proteome organization. Proteome analysis and proteins identification. Sample preparation 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. Protein separation techniques The general principles of proteomic analysis. Basic components of polyacrylamide gels, proteins detection, methods of staining proteins. Electrophoresis – 1D One-dimensional gel electrophoresis, stacking gels, resolving gels, SDS-PAGE electrophoresis, native PAGE electrophoresis, technique of preparation and usage of mini gels. Electrophoresis – 2D Rehydration significance, principles of isoelectric focusing, isoelectric point, rehydration buffers, IPG balancing strips, migration buffers, second- dimensional of 2D-SDS PAGE electrophoresis. Western blotting Transfer of proteins from gel to membrane. Wet transfer, semi-dry transfer. Immunodetection. Mass Spectrometry (MS) application in proteomics Maldi -ToF mass spectrometry -Matrix-Assisted Laser Desorption/Ionization (MALDI), Time-of-Flight (TOF) mass spectrometry, proteolytic enzymes usage in sample preparation. Bioinformatic tools Bioinformatic programs: Quantity One, PDQuest, BioTool. Usage of this programs for proteome analysis. Quantity and quality proteome analysis. Bioinformatics databases, protein identification principles, Peptide Map Fingerprinting –PMF. Proteomics in Poland and in the World Current progress in proteomic studies in the world and their practical application. The purpose of proteomics. HUPO – Human Proteome Organization.	

10. Assessment methods:
11. Recommended reading:

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. Методы обнаружения трихинеллы. Использование метода трихоскопии и травления. Диагностика грибковых заболеваний. Диагностика простейших – паразитов. Систематический анализ кокцидов из ряда <i>Eimeria</i> и <i>Isospora</i> . Ключ для обозначения простейших. Диагностика лейкоза и бешенства. Подведение итогов лекций.	
10. Assessment methods:	
11. Recommended reading:	

1.Course title: ВЕТЕРИНАРНАЯ ПАЗАРИТОЛОГИЯ 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: Питание как основной фактор среды и его влияние на производительность животных. Деление кормов и факторы влияющие на их пищевую ценность. Характеристика компонентов пищевых кормов. Характеристика отдельных групп кормов содержательных и объёмных и их частие в пищевых дозах. Специфика питаия свиней. Укладывание норм и кормовых рационов для свиней по NŽS. 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	

der landwirtschaftlichen Nutztieren. Außer der Biotechniken, die seit Jahrzehnten in der tierzüchterischen Praxis angewandt werden, wie künstliche Besamung, wird insbesondere Embryotransfer (Gewinnung und Qualitätsbeurteilung von befruchteten Eizellen, Kriokonservierung und Übertragung von Embryonen) behandelt. Auch die Fragen der In-Vitro-Befruchtung und des Klonens werden erörtert.

10. Assessment methods:

11. Recommended reading:

1.Course title: IMKELICHE GRUNDLAGE

2. Code: 10G- WBiHZ-09/10

3. ECTS points:4

4. Semester: winter

5. Hours per week

6. Language: German

7. Teaching method:

8. Name of the lecturer: mgr. inż. Jerzy Samborki,

9. Course contents:

10. Assessment methods:

11. Recommended reading:

1.Course title: ALLGEMEINE GRUNDLAGEN DER PHYSIOLOGIE DERNHAUSTIEREN

2. Code: 11G-W- WBiHZ-09/10

3. ECTS points: 6

4. Semester: winter

5. Hours: 10 T

6. Language: German

7. Teaching method: Teil

8. Name of the lecturer: prof. dr hab. Wiesław Skrzypczak

9. Course contents:

I. Humorale und nervöse Regulation

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.

Teil II. Die Physiologie der Verdauungstrakt

Die Verdauung im Magen, im Wiederkauermagen und im Darm. Die Absorption in den verschiedenen Abschnitten des Magen-Darm-Kanals.

Teil III. Die Physiologie der Ernährung: Mineralstoffe, Spurenelemente und Vitamine

Natrium, Kalium, Chlorid, Kalzium, Magnesium, Eisen, Jod,

Teil IV. Das Blut

Die allgemeine Bedeutung des Blutes, die Blutzellen, die Blutgerinnung.

Teil V. Das Herz

Allgemeine Eigenschaften des Herzmuskels, die phasen der Herztaetigkeit, der Blutdruck im Herz, die nervale Beeinflussung der Herzfunktion.

Teil VI. Der Blutkreislauf

Die funktion: der Arterien, der Kapillaren und der Venen, die regulation der Kreislaufs, das lymphatische System.

Teil VII. Physiologie der Atmung

Funktion der Lungen, die mechanik der Lungenatmung, der Transpot des Sauerstoffs und der Kohlensaure im Blut, die Steuerung der Atmung.

Teil VIII. Die Physiologie der Niere (I)

Bau der Niere, allgemeine Aufgaben der Niere, die Durchblutung der Niere, die Funktion des Nephrons, die Ausscheidung des Wassers, der Elektrolyte und Nichtelektrolyte.

Teil IX. Die Physiologie der Niere (II)

Der Wasserhaushalt, Saure-Basen-Haushalt und Niere, die nervalen und hormonalen Einflüsse auf die Nierenfunktion.

Teil X. Die Physiologie der Thermoregulation

Die regulation der Warmebildung und Warmeabgabe, Temperaturregulationszentrum, die Hypothermie, die Hyperthermie und das Fiber.

10. Assessment methods:

11. Recommended reading:

1.Course title: PROTOMIKA	
2. Code: 12F-W- WBiHZ-09/10	3. ECTS points: 6
4. Semester: winter	5. Hours per week
6. Language: Franch	7. Teaching method:
8. Name of the lecturer: dr inż. Małgorzata Ożgo	
9. Course contents:	
10. Assessment methods:	
11. Recommended reading:	

 **SUMMER SEMESTER**

1.Course title: BEEKEEPING IN THE PAST AND PRESENTS	
2. Code: 1E-S- WBiHZ-09/10	3. ECTS points: 4
4. Semester: summer	5. Hours per week
6. Language: English	7. Teaching method:
8. Name of the lecturer: mgr. inż. Piotr Rostecki	
9. Course contents:	
10. Assessment methods:	
11. Recommended reading:	

1.Course title: BIOTECHNOLOGY AND GENETIC ENGINEERING	
2. Code: 2E-S- WBiHZ-09/10	3. ECTS points: 6
4. Semester: summer	5. Hours: 30
6. Language: English	7. Teaching method:
8. Name of the lecturer: dr inż. Arkadiusz Terman	
9. 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.	
10. Assessment methods:	
11. Recommended reading:	

1.Course title: GENETIC AND GENOMIC	
2. Code: 3E-S- WBiHZ-09/10	3. ECTS points: 6
4. Semester: summer	5. Hours per week
6. Language: English	7. Teaching method:
8. Name of the lecturer: dr inż. Arkadiusz Terman	
9. Course contents:	
10. Assessment methods:	
11. Recommended reading:	

1.Course title: KORUNG DER BIENEN	
2. Code: 4G-S- WBiHZ-09/10	3. ECTS points: 4
4. Semester: summer	5. Hours per week
6. Language: German	7. Teaching method:
8. Name of the lecturer: mgr. inż. Jerzy Samborki	
9. Course contents:	
10. Assessment methods:	
11. Recommended reading:	



Faculty of Civil Engineering and Architecture

Architecture and Urban Courses:

WINTER SEMESTER

1.Course title: ARCHITECTURAL DESIGN 1	
2. Code: AIU/MGR/B2	3. ECTS points: 3
4. Semester: winter	5. Hours: 60 DS
6. Language: English	7. Teaching method:
8. Name of the lecturer: Ph.D. Eng. Arch. Leszek Świętek	
9. Course contents: Gaining knowledge about design mechanisms and processes, mastering a skill of variant modeling of processes and simulation in the created architectural space. Design studio programme: 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.	
10. Assessment methods: 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.	
11. Recommended reading:	

1.Course title: ARCHITECTURAL DESIGN 2	
2. Code: AiU/MGR/B3	3. ECTS points: 4
4. Semester: winter	5. Hours: 45 DS
6. Language: English	7. Teaching method:
8. Name of the lecturer: Ph.D. Eng. Arch. Marek Wołoszyn	
9. Course contents: 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. Design studio programme: - 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; - design project of a public use building with a simple programme; - optional spatial solutions performed as simulations in order to expose the differences in energy consumption; - seeking for an optimal solution compromising the aesthetics, function and energy performance of a building; - preparation of a simplified version of the building energy rating.	
10. Assessment methods: A pass result for the design studio is based on the submission of a completed project meeting the below given requirements (material for submission). After passing the subject a pass result is written down into the student's matriculate.	
11. Recommended reading:	

1.Course title: ARCHITECTONIC AND URBAN MODELING	
2. Code: WBiA/ AiU/MGR/A5	3. ECTS points: 1
4. Semester: winter	5. Hours: 30 Lab.
6. Language: English	7. Teaching method:
8. Name of the lecturer: Wojciech Pawłowski, Ph.D. Eng. Arch	
9. Course contents: Discussion of individual computer program used at modeling <ul style="list-style-type: none"> o ArchiCAD o Revit Architecture o 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	
2. Code: AiU/MGR/A4	3. ECTS points: 1
4. Semester: winter	5. Hours: 15 Lab.
6. Language: English	7. Teaching method:
8. Name of the lecturer: Wojciech Pawłowski, Ph.D. Eng. Arch	
9. Course contents: <ul style="list-style-type: none"> - analysis of basic scheme of operation in CAD programs - discussion of main common unit program for CAD programs - discussion of individual CAD programs <ul style="list-style-type: none"> o ArchiCAD o AutoCAD o Revit Architecture o Allplan Nemetschek o ArCon o 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	
2. Code: AiU/MGR/B7	3. ECTS points: 1
4. Semester: winter	5. Hours: L-15, Lab.-30
6. Language: English	7. Teaching method:
8. Name of the lecturer: Olga Sietnicka, Ph.D. Eng. Arch	

<p>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 20th and 21st 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.</p>
<p>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).</p>
<p>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.</p>

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:
8. Name of the lecturer: Ph.D. Eng. Arch. Jarosław Bondar	
<p>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.</p>	
<p>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.</p>	
11. Recommended reading:	

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:
8. Name of the lecturer: : prof. Adam M. Szymiski, Marek Sietnicki, Ph.D. Eng. Arch	
<p>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,</p>	

massing studies, formal studies, functional issues, structural issues, legal issues, landscape and open/public spaces studies, visualizations.
10. Assessment methods: Workshops, brainstorms, 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.

 SUMMER SEMESTER

1.Course title: ARCHITECTURAL DESIGN 1 (SUSTAINABLE DESIGN)	
2. Code: AiU/MGR/B2	3. ECTS points: 3
4. Semester: summer	5. Hours per week: 45 DS
6. Language: English	7. Teaching method:
8. Name of the lecturer: Ph.D. Eng. Arch. Marek Wołoszyn	
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:	

1.Course title: LANDSCAPE DESIGNING	
2. Code: AiU/MGR/B6	3. ECTS points: 2
4. Semester: summer	5. Hours per week:
6. Language: English	7. Teaching method:
8. Name of the lecturer: Magdalena Rzeszotarska – Pałka, Ph.D. Eng. Arch	
9. Course contents: Landscape definition and its cultural meaning. Typology of landscape. Main features of landscape and bases of landscape composition in the urban space. Main compositional elements in the natural and cultural landscape. Architectural and landscape interior and its main conceptions. Meaning of natural factor in the landscape designing: site relief, plant system, water in the landscape. Evaluation of landscape values, natural evaluation. An analysis of cultural values of a landscape, theory of architectural and landscape units and interiors. Landscape protection in Poland and in the world.	
10. Assessment methods: <ul style="list-style-type: none"> - 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	
2. Code: AiU/MGR/B8.2	3. ECTS points: 10
4. Semester: summer	5. Hours: DS-45
6. Language: English	7. Teaching method:
8. Name of the lecturer: Ph.D. Eng. Arch. Jarosław Bondar	
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	
2. Code: AiU/MGR/B8.3	3. ECTS points: 10
4. Semester: summer	5. Hours: DS-45
6. Language: English	7. Teaching method:
8. Name of the lecturer: Ph.D. Eng. Arch. Jarosław Bondar	
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

1.Course title: CONSTRUCTION ECONOMICS	
2. Code: B/S1/OiZ/-/37	3. ECTS points: 3
4. Semester: winter	5. Hours: L-15, Cl.-15
6. Language: English	7. Teaching method:
8. Name of the lecturer: mgr A. Siewiera	
9. Course contents: Costs and incomes in the company. Controlling as a supporting system for management. Costs, profit and responsibility center .ABC analysis. Calculation methods. Profit assessment. BEP analysis - profitability. Financial analysis and marketing.	
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:	

1.Course title: PROJECT MANAGEMENT 1	
2. Code: B/S1/OiZ/-/39-1	3. ECTS points: 4
4. Semester: winter	5. Hours: L-30, Cl.-30
6. Language: English	7. Teaching method:
8. Name of the lecturer: mgr inż. Krzysztof Tracz	
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: - Kerzner Harold "Project Management - A system approach to planning, scheduling and control" John Wiley & Sons, 2003 - Project Management Institute "A guide to the Project Management Body of Knowledge" , 2000 - Halpin D.W. , Woodhead R.W. " Construction Management" John Wiley & Sons Kerzner Harold "Advanced Project Management – edycja polska- John Wiley & Sons, 2004	

1.Course title: CONSTRUCTION SITE MANAGEMENT I	
2. Code: B/S1/OiZ/-/45	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 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	

1.Course title: CONTRACT PROCEDURES	
2. Code: B/S1/OiZ/-/46	3. ECTS points: 5
4. Semester: winter	5. Hours: L-15, P-30
6. Language: English	7. Teaching method:
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	

1.Course title: QUALITY MANAGEMENT SYSTEMS	
2. Code: B/S1/OiZ/-/47	3. ECTS points: 4
4. Semester: winter	5. Hours: L-30, Cl.-30
6. Language: English	7. Teaching method:
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 – <i>Fishbone diagram</i> , <i>Pareto Analysis</i> , <i>TQM</i> , quality costs, documentation structure of QMS, the requirements of norm ISO 9001: 2000 in respect to construction activities,	
10. Assessment methods:	

<p>working out of <i>Quality Policy</i> for construction company, - working out of <i>Quality Plane</i> for indicated construction work - working out of <i>Quality Procedure</i> for indicated of the norm ISO 9001,</p>
<p>11. Recommended reading: - Flood Robert L., Beyond TQM, John Wiley & Sons, 1994 - Georg Stephen, Weimerskirch Arnold, Total Quality Management, John Wiley & Sons, 1994</p>

1.Course title: FINANCES 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 Gorzałczyńska – 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:	

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: Financing of construction projects. Public Private Partnership. Financing against project profitability, Costs of capital - capital budgeting. Investment decisions and criteria. Project selection in respect to the limited budget. Projects connected in portfolio – independent, complementary, exclusive. Assessment of project efficiency and business plans. Social costs and advantages. Economical and financial aspects of non-profit project profitability. K/K analysis. Project risk – types and methods of calculation. Protective strategies and tools.	
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:	

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: - Cashman P.M., Preene M.: Groundwater Lowering in Construction. A Practical Guide. Spon Press. London,	

2001

- Cernica J.: Geotechnical Engineering-Foundation Design. Wiley & Sons, 1995
- Fang H-Y, Daniels J.L.: Introductory Geotechnical Engineering. An Environmental Perspective. Taylor & Francis. London, 2006
- Keller E.A.: Environmental Geology. 8th Edition. Prentice Hall, NJ, 2000
- Legget R.F., Hatheway A.W.: Geology and Engineering. McGraw-Hill Book Company, 3rd Edition, NY, 1988
- Qian X., Koerner R.M., Gray D.H.: Geotechnical Aspects of Landfill Design and Construction. Prentice Hall, NJ. 2002
- Sarsby R.: Environmental Geotechnics. Thomas Telford, London, 2000
- Sharma H.D., Lewis S.P.: Waste Containment Systems, Waste Stabilization and Landfills. John Wiley & Sons, NY. 1994
- Simons N., Menzis B.: A Short Course In Foundation Engineering, Thomas Telford, London, 2000
- Tomlinson. M.J.: Foundation Design and Construction. Prentice Hall, Harlow, 7th Edition, 2001
- Venkatramiah C.: Geotechnical Engineering, Jon Wiley & Sons, 1993
- Eurocode 7.

1.Course title: HYDROGEOLOGY	
2. Code: B/S1/OiZ/-J51	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 Leszek Kaszubowski	
9. Course contents: Groundwater occurrence: Zone of aeration, Zone of saturation , Artesian water. Elementary theory of groundwater flow. Methods of determination of filtration coefficient. Groundwater in nonindurated sediments. Groundwater in sedimentary, magmatic and metamorphic rocks. Analyse of hydrogeological conditions of the study area on the base of geological and hydro geological maps.	
10. Assignment: Determination of filtration coefficient by the aid of empiric methods. Construction of hydro geological cross-sections. Construction of water table and hydro-isobaths maps. Calculation of delivery for uncompleted well. Calculation of delivery for a complete well. Drainage of foundation trench. Elaboration of simplified hydro geological opinion on the base of geological and hydro geological maps.	
11. Recommended reading: - Cashman P.M., Preene M.: Groundwater Lowering in Construction. A Practical Guide. Spon Press. London, 2001. - Davis S.N. and DeWiest R.J.M.: Hydrogeology. Krieger Publishing Company, Florida, 1991.	

1.Course title: POLISH LANGUAGE AND CULTURE	
2. Code: B/S1/OiZ/-I67	3. ECTS points: 4
4. Semester: winter or summer	5. Hours: Lab. 60
6. Language: English/ Polish	7. Teaching method:
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.	

TEACHING/LEARNING METHODS: Traditional classes developing reading, speaking, writing and listening skills with the use of CD players, OHPs, TVs and DVD players. Assignment according to Polish standards.
10. Assessment methods:
11. Recommended reading:

 SUMMER SEMESTER

1.Course title: NEW GENERATION OF CONCRETE	
2. Code: B/S1/OiZ/-/52	3. ECTS points: 3
4. Semester: summer	5. Hours: L-15, Lab-15
6. Language: English	7. Teaching method:
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: - Aitcin P.C. High-Performance Concrete. E&FN SPON 1998. - Nevill A.N. Properties of concrete,2002 - Mindess Sidney, Young J. Francis, Darwin David – Concrete, 2003.	

1.Course title: DURABILITY OF CONCRETE	
2. Code: B/S1/OiZ/-/53	3. ECTS points: 3
4. Semester: summer	5. Hours: L-15,Lab.-15
6. Language: English	7. Teaching method:
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: - Aitcin P.C. High-Performance Concrete. E&FN SPON 1998. - ACI Committee 201, Guide to Durable Concrete (1992). - Goran Fagerlund – Trwałość konstrukcji betonowych, Arkady 1997. - Nevill A.N. Properties of concrete, 2002	

1.Course title: TECHNOLOGY OF STEEL STRUCTURES	
2. Code: B/S1/OiZ/-/54	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. Wiesław Paczkowski	
9. Course contents: 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.	
10. Assignment: Design of a vertical cylindrical steel welded storage tank in compliance with PN-B-03210:1977. <ol style="list-style-type: none"> 1. Contents of the design: 2. Concise description of the tank itself and its corrosion and fire protection. 3. General description of building site and erection of the tank with emphasis on technological aspects of fabrication and erection 4. Structural analysis: shell, bottom, truss girder and purlins, overall tank stability 5. Drawings: <ul style="list-style-type: none"> – Vertical cross-section/outer view of the tank- 1:100; – Plan of the bottom/roof –1:100; – Truss girder with purlins-1:20. 6. Bill of materials 	
11. Recommended reading: - Owens G. W., Knowles P.R., Dowling P.J.: Steel Designers' Manual, Blackwell Scientific Publications, Cambridge, 2003.	

1.Course title: INDUSTRIAL STEEL STRUCTURES	
2. Code: B/S1/OiZ/-/55	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. Wiesław Paczkowski	
9. Course contents: Historical development and modern usage of steel for selected types of structures. Process of design: developing a structural system. Design of industrial buildings: categories, selection process of framing systems, loads imposed on the structure, transport system, general arrangement of typical industrial building. Gantry girders. Telpher beams. Trestle bridges. Industrial chimneys.	
10. Assignment: Design of a vertical cylindrical steel welded storage tank in compliance with PN-B-03210:1977. Contents of the design: <ol style="list-style-type: none"> 1) Concise description of the tank itself and its corrosion and fire protection. 2) General description of building site and erection of the tank with emphasis on technological aspects of fabrication and erection 3) Structural analysis: shell, bottom, truss girder and purlins, overall tank stability 4) Drawings: <ul style="list-style-type: none"> – Vertical cross-section/outer view of the tank- 1:100; – Plan of the bottom/roof –1:100; – Truss girder with purlins-1:20. 5) Bill of materials 	
11. Recommended reading: Owens G. W., Knowles P.R., Dowling P.J.: Steel Designers' Manual, Blackwell Scientific Publications, Cambridge, 2003.	

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: - Bowles, Joseph E.: Foundation Analysis and Design (5 th Edition). McGraw-Hill, 1996. Knovel Release Date: 2007-01-02 - Cashman P.M., Prene M.: Grounwater Lowering in Construction. A Practical Guide. Spon Press. London, 2001 - Cernica J.: Geotechnical Engineering-Foundation Design. Wiley & Sons, 1995 - Day, Robert W.: Foundation Engineering Handbook-Design and Construction with the 2006 International Building Code. McGraw-Hill, 2006. Knovel Release Date: 2006-08-09 - Peck, Ralph B.; Hanson, Walter E.; Thornburn, Thomas H.: Foundation Engineering (2 nd Edition). John Willey & Sons. 1974. Knovel Release Date: 2007-08-22. - Reese, Lymon C.; Isenhower, William M.;Wang, Shin-Tower: Analysis and Design of Shallow and Deep Foundations. John Wiley & Sons. 2006. Knovel Release Date: 2007-08-22 - Simons N., Menzis B.: A Short Course in Foundation Engineering, Thomas Telford, London, 200 - Tomlinson. M.J.: Foundation Design and Construction. Prentice Hall, Harlow, 7 th Edition, 2001 - Venkatramaiah C.: Geotechnocal Engineering, Jon Wiley & Sons, 1993 - Eurocode 7	

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: - Bowles, Joseph E.: Foundation Analysis and Design (5 th Edition). McGraw-Hill, 1996. Knovel Release Date: 2007-01-02 - Cashman P.M., Prene M.: Grounwater Lowering in Construction. A Practical Guide. Spon Press. London, 2001 - Cernica J.: Geotechnical Engineering-Foundation Design. Wiley & Sons, 1995 - Day, Robert W.: Foundation Engineering Handbook-Design and Construction with the 2006 International Building Code. McGraw-Hill, 2006. Knovel Release Date: 2006-08-09 - Monahan, Edward J.: Construction of Fills (2 nd Edition). John Wiley & Sons. 1994. Knover Release Date: 2007-08-22 - Peck, Ralph B.; Hanson, Walter E.; Thornburn, Thomas H.: Foundation Engineering (2 nd Edition). John Willey & Sons. 1974. Knovel Release Date: 2007-08-22.\n- Reese, Lymon C.; Isenhower, William M.;Wang, Shin-Tower: Analysis and Design of Shallow and Deep Foundations. John Wiley & Sons. 2006. Knovel Release Date: 2007-08-22 - Simons N., Menzis B.: A Short Course in Foundation Engineering, Thomas Telford, London, 200 - Tomlinson. M.J.: Foundation Design and Construction. Prentice Hall, Harlow, 7 th Edition, 2001 - Venkatramaiah C.: Geotechnocal Engineering, Jon Wiley & Sons, 1993 - Eurocode 7	

1.Course title: TECHNOLOGY OF REGULATION WORKS	
2. Code: B/S1/OiZ/-/58	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. Jacek Kurnatowski	
9. Course contents: Features of natural rivers, erosion and accumulation, dynamic stability of a river. Purposes of lowland rivers regulation, basic principles. River bed straightening as a technical misconception. Principles for river regulation routing – routing curves, bends curvatures. Systems for lowland rivers regulation. Basic regulation structures – groins, longitudinal structures, embankments, crossing structures. Principles for regulation structures arrangement. Materials used in regulation works, construction elements. Constructions and performance of regulation structures. Technical documentation.	
10. 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.	
11. Recommended reading:	

1.Course title: SPECIAL CONSTRUCTIONS TECHNOLOGY IN HYDROENGINEERING	
2. Code: B/S1/OiZ/-/59	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. Jacek Kurnatowski	
9. Course contents: Active and passive flood protection. Technical and non-technical measures for flood protection. Probability of flows, classification of flood protection dikes. Filtration throughout dikes, methods of its reduction, drainage. Principles for dikes dimensioning. Dikes construction technologies. Dikes maintenance. Crisis management before, during and after the flood.	
10. Assignment: Design of a I ⁰ class flood protection dike along a lowland river.	
11. Recommended reading:	

1.Course title: SITE MANAGEMENT II	
2. Code: B/S1/OiZ/-/60	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 inż. Krzysztof Tracz	
9. 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.	
10. 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	
11. Recommended reading: -Kerzner Harold "Project Management - A system approach to planning, scheduling and control" John Wiley & Sons, 2003 - Kerzner Harold "Advanced Project Management - John Wiley & Sons, 2004 - 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:	

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 Gorzałczyńska – 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:	

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: <ul style="list-style-type: none"> • 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)
- Gréhant B.: Acoustics in buildings. Thomas Telford, London 1996
- Incopera F.P., DeWitt D.P., Bergman T.L., Lavine A.S.: Fundamentals of Heat and Mass Transfer. Sixth Edition, John Wiley & Sons 2007
- MacKenzie R. (Ed.): Auditorium Acoustics. Applied Science Publishers LTD, London 1975
- McMullan R.: Environmental Science in Building. Fifth edition. Palgrave MacMillan, New York 2006
- Roaf S., Fuentes M, Thomas S.: Ecohouse. A Design Guide. Third edition. Elsevier Architectural Press, Amsterdam – Boston – Heidelberg – London – New York – Oxford – Paris – San Diego – San Francisco – Singapore – Sydney – Tokyo, 2007
- Schittich Ch. (Ed.): Building Skins in Detail. New enlarged edition. Edition DETAIL – Institut für internationale Architektur – Dokumentation GmbH, München; Birkhäuser – Publishers for Architecture, Basel – Boston – Berlin 2006

1.Course title: COMPOSITE CONSTRUCTIONS

2. Code: B/S1/OiZ/64

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. Tomasz Wróblewski

9. Course contents:

Basic concepts of composite structures. Design philosophy and the Eurocodes. Properties of materials. Methods of analysis and design. Methods of shear connection. Properties of shear connectors. Effect of slip on stresses and deflections. Composite slabs and beams. Simply-supported composite slabs. Simply-supported composite beams. Continuous beams and slabs, and beams in frames. Composite columns. Beam-to-column joints. Design of non-sway composite frames. Composite bridges.

10. Assignment:

Design of a steel-concrete composite floor system in compliance with PN-EN 1994-1-1:2005. Eurokod 4.

Contents of the design:

- 1) Concise description of the floor.
- 2) Structural analysis: slab, floor beam, binding joist, connectors.
- 3) Drawings.

11. Recommended reading:

1.Course title: PROJECT MANAGEMENT 2

2. Code: B/S1/OiZ/-/39-2

3. ECTS points: 6

4. Semester: summer

5. Hours: L-30, Cl.-30

6. Language: English

7. Teaching method:

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

9. Course contents:

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*.

10. Assessment methods:

- Case studies
 - preliminary budget and efficiency calculation,
 - cash-flow of the construction project,
 - calculation of earned value of project,
 - correction methods to budget and project delays,
 - examples of reports and MOMs

11. Recommended reading:

- Kerzner Harold "Project Management - A system approach to planning, scheduling and control" John Wiley & Sons, 2003
- Kerzner Harold "Advanced Project Management – edycja polska- John Wiley & Sons, 2004
- Rory Burke „ Project management – planning and control” - John Wiley & Sons, 1993

1.Course title: CONSTRUCTION LAW	
2. Code: B/S1/OiZ/-/2	3. ECTS points: 3
4. Semester: summer	5. Hours: L-15, Cl.-15
6. Language: English	7. Teaching method:
8. Name of the lecturer: mgr inż. Krzysztof Tracz	
Course contents:	
<ol style="list-style-type: none"> 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:	



Faculty of Computer Science and Information Technology

 WINTER SEMESTER

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 MALTLAB environment.	
10. Assessment methods:	
11. Recommended reading:	

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:	



Faculty of Mechanical Engineering and Mechatronics

Material Science Courses:

✚ WINTER SEMESTER

1.Course title: FUNDAMENTAL OF MATERIALS SCIENCE	
2. Code: 1W-WIMiM-09/10	3. ECTS points: 4
4. Semester: winter	5. Hours per week: L-2, T-1
6. Language: English	7. Teaching method:
8. Name of the lecturer: dr W. Jasiński, dr M. Ustasiak, prof. B. Piekarski	
9. Course contents: Elasticity and macroscopic plasticity. Dislocation kinetics and lattice defects. Fundamentals of Fracture Mechanics. Models of failure. Stress concentrations. Center-cracked plate under uniform tension. Criteria for analysis of load-displacement records. Linear elastic fracture mechanics. Fracture toughness. Fatigue and stress corrosion cracking. Fractography and fractographs.	
10. Assessment methods:	
11. Recommended reading:	

1.Course title: METALLIC MATERIALS	
2. Code: 2W-WIMiM-09/10	3. ECTS points: 4
4. Semester: winter	5. Hours per week: L-2, T-2
6. Language: English	7. Teaching method:
8. Name of the lecturer: prof. J.Nowak	
9. Course contents: Corrosion resistant metals. Creep resistant Ni- and Co-based alloys. Intermetallic compounds. Precipitation hardened steel. Wear resistant steels and cast iron. Alloys for special applications. Superconductivity and superconducting alloys. Superplasticity and superplastic metals. Metallurgy of copper and aluminium. Application of copper and aluminium Basis of powder metallurgy.	
10. Assessment methods:	
11. Recommended reading:	

1.Course title: CERAMICS	
2. Code: 3W-WIMiM-09/10	3. ECTS points: 4
4. Semester: winter	5. Hours per week: L-2, T-1
6. Language: English	7. Teaching method:
8. Name of the lecturer: prof. J. Nowacki	
9. Course contents: Short-Range order in crystalline ceramic materials. Long-range order in crystalline ceramic materials. Silicate structures. Imperfections in crystalline ceramic structures. Noncrystalline ceramic materials. Deformation and failure. Phase diagrams in ceramic materials. Processing of ceramics. Applications and properties of ceramics. Concrete. Carbon materials.	
10. Assessment methods:	
11. Recommended reading:	

1.Course title: POLYMER MATERIALS II	
2. Code: 4W-WIMiM-09/10	3. ECTS points: 4

4. Semester: winter	5. Hours per week: L-2, T-1
6. Language: English	7. Teaching method:
8. Name of the lecturer: prof. Z. Rosłaniec, dr A. Szymczyk	
9. Course contents: Thermoplastic polymers. Chemical and physical modification of thermoplastics. Novel thermoplastics with specific properties for new applications. Modern technologies of thermoplastics synthesis. Influence of chemical structure on physicochemical and mechanical properties. Thermoplastics structure and modification of properties through structure change. Ecological aspects and application of thermoplastics.	
10. Assessment methods:	
11. Recommended reading:	

1. Course title: METAL AND CERAMIC COMPOSITES	
2. Code: 5W-WIMiM-09/10	3. ECTS points: 3
4. Semester: winter	5. Hours per week: L-2
6. Language: English	7. Teaching method:
8. Name of the lecturer: prof. J. Nowacki	
9. Course contents: Particulate-reinforced composite materials. Dispersion-strengthened composites. True particulate composites. Fiber-reinforced composites. Predicting properties of fiber-reinforced composites. Manufacturing fibers and composites fiber-reinforced systems. Laminar composite materials. Manufacturing laminar composites. Concrete. Sandwich structures..	
10. Assessment methods:	
11. Recommended reading:	

1. Course title: METHODS AND TECHNIQUES OF MATERIALS TESTING	
2. Code: 6W-WIMiM-09/10	3. ECTS points: 4
4. Semester: winter	5. Hours per week: L-2, T-2
6. Language: English	7. Teaching method:
8. Name of the lecturer: dr P. Kochmański	
9. Course contents: Light Microscopy. Scanning Electron Microscopy. Scanning Tunneling Microscopy and Scanning Force Microscopy. Transmission Electron Microscopy. Energy-Dispersive X-Ray Spectroscopy. Wavelength - Dispersive X-Ray Spectroscopy. Electron Energy-Loss Spectroscopy in the Transmission Electron Microscope. Scanning Transmission Electron Microscopy. Electron Probe X-Ray Microanalysis. X-Ray Diffraction. Dilatometry. Quantitative metallography. Magnetic properties examinations.	
10. Assessment methods:	
11. Recommended reading:	

1. Course title: POLYMER PROCESSING I	
2. Code: 7W-WIMiM-09/10	3. ECTS points: 4
4. Semester: winter	5. Hours per week: L-2, T-2
6. Language: English	7. Teaching method:
8. Name of the lecturer: prof. Z. Rosłaniec , dr K. Kwiatkowski	
9. Course contents: Processability of thermoplastics. Material preparation for moulding. Enriching agents. Moulding: press moulding, extrusion moulding, injection moulding, calendaring, blow moulding, vacuous moulding. Finishing. Joining.	
10. Assessment methods:	
11. Recommended reading:	

1. Course title: SURFACE ENGINEERING

2. Code: 8W-WIMiM-09/10	3. ECTS points: 3
4. Semester: winter	5. Hours per week: L-1, T-2
6. Language: English	7. Teaching method:
8. Name of the lecturer: prof. J. Baranowska	
9. Course contents: Surface of solids. Surface layers and coatings. Energy of surface. Sorption, active centres, chemical reactions, catalysis. Diffusion. Structure and surface defects. Wettability, electrode potential, adsorption. Friction, lubrication, wearing. Surface modification: mechanical, chemical, thermal, physical, thermo-mechanical, electrochemical treatments. Method of surface characterization	
10. Assessment methods:	
11. Recommended reading:	

 SUMMER SEMESTER

1. Course title: POLYMER MATERIALS III	
2. Code: 9S-WIMiM-09/10	3. ECTS points: 5
4. Semester: summer	5. Hours per week: L-2, T-2
6. Language: English	7. Teaching method:
8. Name of the lecturer: prof. Z. Roślaniec, dr A. Szymczyk	
9. Course contents: Elastomers: type of elastomer materials and their application; rubber elasticity: stress-strain relationship, elongation and compression set. Rubber compound: rubbers, curing system, fillers, plasticizers, antioxidants. Rubber vulcanisation: chemistry and technology. Rubber processing. Rubber for food application. Thermoplastic elastomers.	
10. Assessment methods:	
11. Recommended reading:	

1. Course title: POLIMER PROCESSING II	
2. Code: 10S-WIMiM-09/10	3. ECTS points: 5
4. Semester: summer	5. Hours per week: L-2, T-2
6. Language: English	7. Teaching method:
8. Name of the lecturer: dr M. Urbaniak, dr M. Kacperski	
9. Course contents: Mechanism of hardening plastics. Technological properties, processability of unreinforcement resins, preparation of foamed products, processability of reinforcement resins. Processing of composites.	
10. Assessment methods:	
11. Recommended reading:	

1. Course title: COMPOSITES II	
2. Code: 11S-WIMiM-09/10	3. ECTS points: 4
4. Semester: summer	5. Hours per week: L-1, T-2
6. Language: English	7. Teaching method:
8. Name of the lecturer: dr M. Królikowski, prof. W. Biedunkiewicz	
9. Course contents: Elastic characteristics of multilayer composites. Theory of laminates. Criteria for strength resistance analysis of composite structure components. Micromechanics of composites. Material effort criteria for multilayer composite materials. Strength resistance of composite materials with skew reinforcement. Rules of laminate composite materials design. Specific properties of laminates.	
10. Assessment methods:	
11. Recommended reading:	

1. Course title: RECYCLING I	
2. Code: 12S-WIMiM-09/10	3. ECTS points: 2

4. Semester: summer	5. Hours per week: L-2
6. Language: English	7. Teaching method:
8. Name of the lecturer: prof. A. Błędzki	
9. Course contents: The Law regulations of recycling in the world. Economical aspects of recycling of polymer materials. Systems of collecting recyclable materials. Machines and devices for recycling of polymers. Sorting and processing recyclables. Filtration of wastes in melting state. Lines for recycling of polymers.	
10. Assessment methods:	
11. Recommended reading:	

1. Course title: PACKAGING I	
2. Code: 13S-WIMiM-09/10	3. ECTS points: 1
4. Semester: summer	5. Hours per week: L-1
6. Language: English	7. Teaching method:
8. Name of the lecturer: prof. A. Błędzki	
9. Course contents: Plastics Packaging: properties, processing, applications and regulations. Film properties of plastics and elastomers. Flexible packaging - adhesives, coatings and processes. Rigid plastics packaging - PET packaging technology. Recycling packaging materials. Intelligent packaging. Storage and distribution.	
10. Assessment methods:	
11. Recommended reading:	

1. Course title: FUNDAMENTAL MATERIALS	
2. Code: 14S-WIMiM-09/10	3. ECTS points: 4
4. Semester: summer	5. Hours per week: L-4
6. Language: English	7. Teaching method:
8. Name of the lecturer: dr J. Typek	
9. Course contents: Magnetic and magnetostrictive materials. Ferroelectrics. Phase change. Optical transition materials. Ferroelectric thick and thinfilms, applications. Spintronics Physics and Materials. Spintronic Functions and Devices. Quantum Information Processing Using Spins.	
10. Assessment methods:	
11. Recommended reading:	

1. Course title: NANOMATERIALS	
2. Code: 15S-WIMiM-09/10	3. ECTS points: 3
4. Semester: summer	5. Hours per week: L-2
6. Language: English	7. Teaching method:
8. Name of the lecturer: dr M. Kwiatkowska, dr A. Biedunkiewicz	
9. Course contents: Trend of miniaturization and the Moore's Law. Scales of various systems. Characterization Tools Direct Methods: optical, electron, and scanning probe microscopy. Indirect methods: diffraction techniques for periodic structures.	
10. Assessment methods:	
11. Recommended reading:	

1. Course title: BIOMATERIALS	
2. Code: 16S-WIMiM-09/10	3. ECTS points: 3
4. Semester: summer	5. Hours per week: L-2, T-2
6. Language: English	7. Teaching method:
8. Name of the lecturer: prof. A. Błędzki	
9. Course contents:	

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:	
1. 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: Materials selection: metals and alloys, metal purification, non-metallic materials. Alteration of environment: changing medium, inhibitors. Design: wall thickness, design rules. Cathodic and anodic protection: protective currents, anode selection, prevention of stray-current effects. Coatings: metallic, other inorganic and organic. Economic considerations. Corrosion control standards. Pollution control.	
10. Assessment methods:	
11. Recommended reading:	

Department of Thermal Technology Courses:

1. 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. Eliaz	
9. Course contents:	
10. Assessment methods:	
11. Recommended reading:	

1. 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. Eliaz	
9. Course contents:	
10. Assessment methods:	
11. Recommended reading:	

1. 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. Eliaz	
9. Course contents:	
10. Assessment methods:	
11. Recommended reading:	

1. 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. - Fuell 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. - Conduction: Fourier's Law of Heat Conduction, thermal conductivity, steady conduction in solids with plane, cylindrical and spherical isothermal surfaces, interfacial resistance. - Theory of convection: free, mixed and forced convection. The Newton's Law of cooling, The heat transfer coefficient. 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, Π -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.

- Radiation: introduction, Planck's Law, Wien's Law, Stefan-Boltzmann Law, Kirchhoff's Law , Lambert's Law. Radiation between black surfaces separated by non-absorbing medium, view factor.

10. Assessment methods:

11. Recommended reading:

1.Course title: THERMODYNAMICS

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.

-The Second Law of Thermodynamics : entropy, thermodynamic cycles, Carnot cycle , maximum efficiency/performance, The Second Law of Thermodynamics.

- 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.

- Energy conversion-gas cycles : The Sabathe Cycle, Otto Cycle, The Diesel Cycle, The Stirling Cycle, The Ericsson Cycle, The Brayton Cycle.

- Energy conversion – Vapor cycles: Mollier Diagram, The Rankine Cycle ,refrigeration.

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 Zapalowicz

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:



Faculty of Environmental Management and Agriculture

✚ WINTER SEMESTER

1.Course title: NUTZPflanzen 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: Das Ziel des Kurses ist Darstellung den wichtigsten Kulturpflanzen, die in Tropen und Subtropen angebaut sind. Es wird über die wirtschaftliche Bedeutung, Botanik (kurze Charakteristik), Nutzungswert des Haupt- und Nebenprodukten, Standortbedingungen (Boden- und Klimaverhältnisse) und gewählte Anbauverfahren von durch den Studierenden gewählten Arten berichtet. Als Beispiel kann hier Anbau von Reis, Amaranthus, Quinoa, Baumwolle, Maniok, Ölpalme, Kaffee, Kakao, Tee u.a. genannt werden.	
10. Assessment methods:	
11. Recommended reading:	

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:	

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:	

1.Course title: ANBAU VON ALTERNATIVPFLANZEN	
2. Code: 4- WKSIR-09/10	3. ECTS points: 6
4. Semester: summer	5. Hours per week
6. Language: German	7. Teaching method:
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 hermaphrodita), 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:	

1.Course title: TYPENBESCHREIBUNG UND KARTIERUNG VON WALDSTANDORTEN	
2. Code: 5-WKSIR-09/10	3. ECTS points: 2
4. Semester: summer	5. Hours per week
6. Language: German	7. Teaching method:
8. Name of the lecturer: Dr. Ing. Tadeusz Leśnik	
9. Course contents: Natürliche Bedingungen der Forstwirtschaft in Polen. Boden-Klimaverhältnisse, Artenverbreitung. Räumliche Differenzierung. Einführung und Grundlagen. Aufgaben und Zweck der forstlichen Standortkartierung Begriffsbestimmung. Grundsätze des Verfahrens. Arbeitsschritte der Standortaufnahme. Organisation. Anleitung zur praktischen Arbeit. Technische Vorbereitung. Beschaffung und Auswertung von Unterlagen. Erstellung von Grundkarte und Feldbuch für Feldarbeit. Standortserkundung. Übersichtsbegehung und Erfassung der Eigenschaften des Kartierungsgebietes über Probepunkte. Klassifikation – Ableitung der Standorteinheiten. Gliederungsprinzip und Gliederungskategorien. Kartierung und Datenverwaltung. Aufnahme der Standortmerkmale. Erhebungsmerkmale: allgemeine Standortmerkmale, Bodenmerkmale und Aufnahme der ertragskundlichen Merkmale. Vegetationsaufnahme. Komplexmerkmale, abgeleitete Merkmale: Waldgesellschaft, klimatische Höhenstufe, Wuchsgebiete, Bodenhaushalt, Trophie, Bodentyp und Humusformen. Zusammenfassung. Vorkommen der Waldstandortstypen in Polen und auf dem Gebiet von Westpommern.	
10. Assessment methods:	
11. Recommended reading:	

1.Course title: ANBAUTECHNOLOGIE VON GETREIDE UND SCHMETTERLINGSGSBÜTLER	
2. Code: 6- WKSIR-09/10	3. ECTS points: 6
4. Semester: summer	5. Hours per week
6. Language: English	7. Teaching method:
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:	

1.Course title: BIOTECHNOLOGY IN AGRICULTURE	
2. Code: 7- WKSIR-09/10	3. ECTS points: 6
4. Semester: summer	5. Hours per week
6. Language: English	7. Teaching method:
8. Name of the lecturer: prof. dr hab. Piotr Masojć	
9. Course contents: Genetic structure of cultivated crops. Methods of genome research. Methods of genetic engineering. Methods of generating transgenic plants (GMO). Useful traits modified by genetic engineering. Commercially available GMO in agriculture. Molecular pharming. Molecular breeding. Biosafety aspects of GMO production. Methods of GMO detection in commercial products.	
10. Assessment methods:	
11. Recommended reading:	

1.Course title: CHARACTERIZATION OF SELECTED HORTICULTURAL CROPS	
2. Code: 8-WKSIR-09/10	3. ECTS points: 2
4. Semester: summer	5. Hours per week
6. Language: English	7. Teaching method:
8. Name of the lecturer: dr inż. Monika Grzeszczuk, dr inż. Katarzyna Skupień-Wysocka	
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.	
10. Assessment methods:	
11. Recommended reading:	

1.Course title: BIOLOGICAL PROTECTION OF PATHOGENS	
2. Code: 9- WKSIR-09/10	3. ECTS points: 6
4. Semester: summer	5. Hours per week
6. Language: English	7. Teaching method:
8. Name of the lecturer: prof. dr hab. Janusz Błaszczowski	
9. Course contents: Introduction to plant pathology (e.g., The concept of diseases in plants. Classification of plant diseases. Genetic engineering and plant pathology. Significance of plant diseases. Diagnosis of plant diseases). Parasitism and disease development (e.g., Parasitism and pathogenicity. Host range of pathogens. Stages of the development of diseases). Mechanisms of plant defenses against pathogens. Genetics of plant disease. Environmental effects on infections plant disease development. Plant disease epidemiology. Control of plant diseases. The role of different organisms in protection of plants from diseases (e.g., phyllosphere fungi, rhizosphere fungi, symbiotic microorganisms, including mycorrhizal fungi). Morphology and significance of the most important pathogenic, saprotrophic, and symbiotic microorganisms. Application of biotechnology in plant pathology.	
10. Assessment methods:	
11. Recommended reading:	

1.Course title: SOIL TILLAGE IN SUSTAINABLE AGRICULTURE	
2. Code: 10-WKSIR-09/10	3. ECTS points: 5
4. Semester:	5. Hours per week
6. Language: English	7. Teaching method:
8. Name of the lecturer: dr inż. Jacek Wereszczaka	
9. Course contents: The introduction to sustainable agriculture and presentation of impact of tillage systems on environment. Lectures: A brief history of agriculture revolution in the World. Future land utilization and management for sustainable crop production. Soil tillage systems. Tillage systems terminology. Conservation tillage in sustainable agriculture. Soil tillage for crop production and for protection of soil	

and environment quality. Biophysical and chemical factors affecting choice of tillage system. Soil conditions and growth of plants in different tillage systems. Weed development in different soil conditions affected by tillage – weed control and plant protection. Role of cover crops on maintenance of soil productivity and an integrated crop production. The ICP – Integrated Crop Production and BMP - the Best Management Practices in sustainable agriculture. Soil management in the future. Farming systems for sustainability. Classes: Estimation of direction of changing on physical properties of soil after different cultivation. Predicting of roads development in compacted and structural soils. Improving of soil organic matter by carbon sequestration. Activities: a capture of practical methods of introduction tillage systems in farms, soil properties, plants growing stages on chosen fields will be presented during the practice field activities (two excursions)

10. Assessment methods:

11. Recommended reading:

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:

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:

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:

1. Course title: FLORICULTURE PRODUCTION – CUT FLOWERS	
2. Code: 13- KSiR-09/10	3. ECTS points: 3
4. Semester: summer	5. Hours per week
6. Language: English	7. Teaching method:
8. Name of the lecturer: prof. dr hab. Joanna Nowak	
9. Course contents: Major cut flowers: rose, chrysanthemum, gerbera, orchids, anthurium, freesia, carnation, minor cut flower crops. Forcing bulbous plants: tulip, lily, daffodil, hyacinthus, minor bulbous crops. Species and their characteristics. Cultivars. Production facility and schedules. Propagation from seeds and vegetative methods. Media and fertilization. Effects of environmental conditions. Postharvest handling and marketing of cut flowers.	
10. Assessment methods:	
11. Recommended reading:	



Food Technology and Human Nutrition Courses:

 **WINTER SEMESTER**

1. Course title: NUTRITION IN DIFFERENT PHYSIOLOGICAL STATES	
2. Code: 1WNoŻiR-09/10	3. ECTS points: 7
4. Semester: winter	5. Hours per week:
6. Language: English	7. Type of studies: second degree
8. Name of the lecturer: dr inż. Joanna Sadowska	
9. 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). 4. The breast-feeding. The human milk composition and its functions. 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).	
10. Assessment methods:	
11. Recommended reading:	

1. Course title: ERNÄHRUNGSSYSTEME UND DIÄTEN - PHYSIOLOGISCHE ASPEKTE	
2. Code: 2WNoŻiR-09/10	3. ECTS points: 7
4. Semester: winter	5. Hours per week:
6. Language: German	7. Type of studies: second degree
8. Name of the lecturer: dr inż. Magdalena Radziszewska	
9. Course contents: Die Thematik: - Das Essen und die Gesundheit in primitiven Kulturen. - Die Bedürfnisse des Organismus in der psychosomatischen Entwicklung. - Die Physiologie des Geschmacksinnes und des Geruchsinnes 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	

Fleisch? - Das Leben ohne Entschlackungskuren - wie am besten leben, um abzunehmen. - Null-Diät - hat totales Fasten einen Sinn? - Leben durch Lichtnahrung - ist es möglich? - Diätetische Lebensmittel und Supplemente (Vitamine, Mineralstoffe und Spurenelemente) aus der Apotheke - brauchen wir sie wirklich?
10. Assessment methods:
11. Recommended reading:

1.Course title: HYGIENE IN FOOD INDUSTRY	
2. Code: 3WNoŽiR-09/10	3. ECTS points: 5
4. Semester: winter	5. Hours per week:
6. Language: English	7. Type of studies: second degree
8. Name of the lecturer:	
9. Course contents: 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. Initial requirements: Knowledge of the rudiments of Food Hygiene and Food Technology The sanitary-hygienic requirements associated with designing and construction of food processing plants. Location of the plants. The arrangement of compartments, construction of walls and floors of food factories. The arrangement of the production lines. Hygienic requirements concerning all the stages production from the preparation through processing, manufacture, packaging, storage, transport (distribution and trading) as far as sales to customers including the requirements applicable to equipment and materials in contact with food. The rules of waste treatment. External and internal contaminants of the produced food, critical points, employees health. Work safety. Cleaning means and agents in production plants.	
10. Assessment methods: Credit for classes and final examination	
11. Recommended reading:	

1.Course title: PESTS IN FOOD INDUSTRY AND THEIR CONTROL	
2. Code: 4WNoŽiR-09/10	3. ECTS points: 5
4. Semester: winter	5. Hours per week:
6. Language: English	7. Type of studies: second degree
8. Name of the lecturer:	
9. Course contents: Theoretical and practical introduction of the students to the problems related with the presence of pests, preventive methods and methods of control. Initial requirements: Knowledge of biology, rudiments of food hygiene and toxicology, food technology Pests typical for raw material and foodstuff warehouses and fodder storage facilities. Quantitative and qualitative losses in food infested by pests. Plant protection in aviculture and the adequate warehouse protection against pests. Methods of pest control. Methods of food testing for the presence of pests and parasites. Identification of pests and parasites present in food. Identification of pests by the type of damages resulting from their activities. Knowledge of means applied in control of warehouse pests.	
10. Assessment methods: Credit for classes and final examination	
11. Recommended reading:	

 SUMMER SEMESTER

1.Course title: SELECTED TOXICOLOGY PARTS	
2. Code: 5WNoŽiR-09/10	3. ECTS points: 4

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:	

1. Course title: DAIRY TECHNOLOGY	
2. Code: 6WNoŽiR-09/10	3. ECTS points: 8
4. Semester: summer	5. Hours per week:
6. Language: English	7. Type of studies: second degree
8. Name of the lecturer:	
9. Course contents: Subject Dairy Technology is realized on the 2 nd 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:	

1. Course title: FOOD TOXICOLOGY AND ITEMS OF COMMON USE	
2. Code: 7WNoŽiR-09/10	3. ECTS points: 6
4. Semester: summer	5. Hours per week:
6. Language: English	7. Type of studies: first degree
8. Name of the lecturer:	
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	

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: 8WNoŽiR-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: 9WNoŽiR-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 Tests of: acute, subacute and chronic toxicity. Methods of research of water and land organisms and alternative methods in toxicity tests. Field tests as an element of examination of ecosystems hazard. Bioconcentration (bioaccumulation) of contaminations. Contamination biology monitoring. Bioindicators and biomarkers and their unique features. Bioconcentration and biomarkers in the assessment of the results of the environment contamination.	
10. Assessment methods:	
11. Recommended reading:	

 SUMMER SEMESTER

1.Course title: TOXICOLOGY AND FODDERS HIGIENE IN PISCICULTURE	
2. Code: 10WNoŽiR-09/10	3. ECTS points: 3
4. Semester: summer	5. Hours per week:

6. Language: English (Russian)	7. Teaching method:
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:	

1.Course title: CELL BIOLOGY	
2. Code: 11WNoŽiR-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: - Subject contents: Procariotic and eucariotic cells. - The construction of cells. - The molecules of life. - Viruses: structure and function. - Membrane structure. - Organelle biogenesis. - Cell motility and control of cell shape. - Cell cycle. - Research methods in cell biology. - Golgi apparatus and plasmalemma: SER, RER, endosomes, lysosomes. - Cell aging and death, apoptosis. - Structure and functional relationships of endoplasmic reticulum. - Chromosomal DNA: distribution, replication. RNA synthesis and role. - Other organelles. - Cancer and different types of cells	
10. Assessment methods:	
11. Recommended reading:	

1.Course title: MODEL RESEARCHES OF FISHING GEARS	
2. Code: 12WNoŽiR-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: 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. Initial requirements: mathematics, physics, fishing techniques (basic information) 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	

with the above mentioned devices. Besides students gain experience in: <ul style="list-style-type: none"> • 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: 13WNoŽiR-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 embriology 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, CURENT STATUS, POPULATIONS DYNAMICS AND ECOLOGICAL CONSEQUENCES	
2. Code: 14WNoŽiR-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 allochtonous 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: Modul: Systematics and biology of allochtonous 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 curent status. Proportion of species with salnity and temperature preferences.	
10. Assessment methods: Test	

11. Recommended reading:

1.Course title: HYDROCHEMICAL TERMINOLOGY	
2. Code: 15WNoŽiR-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 Subject contents: Oxygen. The oxygen content of inland waters. Distribution of dissolved oxygen in running waters. Distribution of dissolved oxygen in lakes. Salinity of inland waters. Ionic composition of surface waters. Sources of salinity. Distribution of major ions in fresh waters. Ionic budgets within a drainage basin. The inorganic carbon complex. The occurrence of inorganic carbon in freshwater systems. Spatial and temporal distribution of total inorganic carbon and pH in rivers and lakes. Hypolimnetic CO ₂ accumulation in relation to lake metabolism. Photosynthetic inorganic carbon use. The nitrogen cycle. Sources and transformation of nitrogen in waters. Inorganic and organic nitrogen. The phosphorus cycle. Iron, sulfur and silica cycles. Shallow lakes and ponds.	
10. Assessment methods:	
11. Recommended reading:	

1.Course title: GAME FISHES OF THE WORLD. ANGELSPORTLICHE FISCHARTEN IN DER WELT	
2. Code: 16WNoŽiR-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:	

1.Course title: ECO-PRODUCT DESIGN	
2. Code: 17WNoŽiR-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: <ol style="list-style-type: none"> 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 <ol style="list-style-type: none"> a. identification and assessment of customer needs, converting needs to specification, 	

<ul style="list-style-type: none"> 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:


 WINTER SEMESTER

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: Ship types and dimensions. General arrangement of ship. Main ship hull particulars. Body lines and coefficients, reference planes. International and national maritime organizations and institutions, classification societies. Rules and regulations, international conventions. Ship structural materials – steels, wood, aluminium alloys, reinforced plastics. Joining methods. Environment conditions and loads. Local and overall strength of ships. Hull structure – structural components and selected outfitting elements: double bottom, sides, decks, bulkheads, fore and aft ends, main engine room including engine foundations, superstructures, valves, deck equipment. Design and building planning – ship drawings and modelling – CAD/CAM systems and software. Ship construction – fabrication steps – lofting, steel ordering, cutting and forming, fabrication, control of dimensions, launching, trials and preparation for delivery. Construction of selected ship types – general cargo vessels, containerships, oil tankers, chemical and gas tankers, passenger ships, high speed craft.	
10. Assessment methods:	
11. Recommended reading:	

1. Course title: SHIP STRUCTURAL OPTIMALIZATION	
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: Introduction. Problems and methods of general optimization: basic ideas, general formulation of optimization problem, classification of optimization problems, general formulation of optimization algorithm, classification of optimization algorithms. Ship structural optimization: general formulation of ship structural optimization problem, features of ship structural optimization problems, approaches in ship structural optimization (material, shape, topology and scantling optimization), methods of ship structural optimization (classical gradient based and heuristic optimization methods – evolutionary algorithms, genetic algorithms, simulated annealing). Economic basis for ship structural optimization (discounting, initial costs, building costs, annual cash-flow).	
10. Assessment methods:	
11. Recommended reading:	

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	

indeterminate trusses. Analysis of strain and stress. Generalized Hooke law. Axially-symmetrical thin-walled vessels. Shear calculation, bolt connections, welded connections. Moments of inertia of planar figures. Torsion of bars with circular cross-sections. Free torsion of bars with rectangular cross-sections. Bending: shear forces and bending moments diagrams, differential equation of deflection. Skew bending. Analysis of coil springs. Combined stress; strength hypotheses, calculation of combined stress in bars. Statically indeterminate beams. Elastic and elastic-plastic buckling of bars. Energy methods.

10. Assessment methods:

11. Recommended reading:

1. Course title: **GENERAL FLUID MECHANICS**

2. Code: 4-W-WTM-09/10

3. ECTS points: 3

4. Semester: winter

5. Hours per week

6. Language: English

7. Teaching method:

8. Name of the lecturer: dr Tomasz Abramowski

9. Course contents:

Introduction: significance of fluid mechanics, flow classification, basic units, fluid properties. Fluid statics: pressure, pressure measurements, balance equation, hydrostatic forces on surfaces, buoyancy, floating bodies' stability. Fluids in motion: flow velocity, rate of flow, continuity equation, rotation and vorticity, separation, Bernoulli equation and its applications, cavitation. Momentum and energy principles: derivation of momentum and energy equations, simplified forms and applications. Dimensional analysis: Buckingham II Theorem, dimensionless numbers, similarity laws, introduction to model studies for flows. Laminar and turbulent flows: measurement of viscosity, what is turbulence? Transition to turbulence, turbulent and laminar boundary layers, flow in conduits, pipe systems flow and losses. Drag and lift: aerofoil or hydrofoil? Drag of two and three dimensional bodies, lift, hydrofoil dynamic characteristics, flow on a plane wing, vortex shedding. Compressible flow: effect of compressibility on drag and lift, wave propagation, mach number effects. Flow measurements, introduction to multiphase flow problems, turbomachinery, short overview of numerical approaches – computational fluid dynamics, selected industry applications.

10. Assessment methods:

11. Recommended reading:

1. Course title: **ECONOMICS OF SHIPBUILDING**

2. Code: 5-W-WTM-09/10

3. ECTS points: 3

4. Semester: winter

5. Hours per week

6. Language: English

7. Teaching method:

8. Name of the lecturer: dr Remigiusz Iwańkiewicz

9. Course contents:

Theory of consumer. Classification and specificity of undertakings. Short period theory of production. Analysis of production costs. Models of market structure. Competition and monopoly. Optimal production structure. Markets of production factors. Basis of distribution theory. Market of labour and earnings. Market of land and capital. Specificity of ship building industry. Demand and supply in ship production. Economical analysis of production flow in a shipyard. Lean production concept. Productivity of a shipyard. Problems of co-operating transport economy in ship production. Ship yard production financing. Labour standardization and earnings in a shipyard.

10. Assessment methods:

11. Recommended reading:

1. Course title: **UNDERWATER TECHNOLOGY**

2. Code: 6-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:

Classification of deep-water objects: flying, submersed, flooded and grounded structures, stationary

and movable structures, working and recreational. Rigs, caissons, pipe installations, energy installations. Categories of underwater vehicles: manned, unmanned, flying and bottom oriented, tethered and autonomous systems. Technology and exploitation criteria in design and building. Materials. Forming, fitting, outfitting. Tolerances in the building process. Measurements of imperfections, data mining. Maintenance and repair of underwater objects.

10. Assessment methods:

11. Recommended reading:

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:

Ocean as a space of underwater transport. Regions of underwater activity applying transport means. Classification of means of transport and areas of their application. Rigs, caissons, pipe installations, energy installations. Categories of underwater vehicles: manned, unmanned, flying and bottom oriented, tethered and autonomous systems. Exploitation of underwater objects. Goods to be transported. Criteria of efficiency. Maintenance and repair of underwater means of transport.. Design of the chosen paths of underwater transport for assumed regions. Multicriteria analysis of the transport means efficiency. Case study: application of remotely operated vehicle in underwater transport tasks.

10. Assessment methods:

11. Recommended reading:

 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 Iwańkiewicz

9. Course contents:

Theory of decision algorithms. Problems of resources distribution, models and methods of linear and discrete programming. Optimization of production assortment, choice of technology, simplex algorithm, sensibility analysis. Problems of transport and distribution. Game theory. Planning and organization of enterprises applying net programming – CPM, PERT, PERT-COST methods. Dynamic models in a supply control.

10. Assessment methods:

11. Recommended reading:

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 Iwańkiewicz

9. Course contents:

Stages of construction design. Standardization of labour and materials. Production efficiency balancing. Organization of production flow in shipyard. Fabrication technologies in shipbuilding cycle. Optimization of work stand parameters applying methods of operations research. Conditions of automation and robotics implementation. Significance of standardization. Technological aspects of implementation of constructional innovation in a ship. CAD/CAM in shipbuilding – ERP systems as integration of constructional and technological information processing.

10. Assessment methods:

11. Recommended reading:

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: Introduction. Model tests – similarity laws. Full-scale tests. Propellers: geometry of propellers, momentum theory, propeller characteristics, cavitation, cavitation tunnel, open-water tests, propeller design procedure. Resistance and propulsion: interaction between ship and propeller, propulsive efficiency, decomposition of resistance, towing tanks and experimental approach, ITTC prediction method, additional resistance under service conditions. Ship maneuvering: maneuvering devices, rudders geometry and characteristics, rudder design, simulation of maneuvering, force coefficients, motion equations, shallow water and other influences, experimental approaches, ship full-scale trials at sea. Seakeeping: waves and seaway, ship motions in waves, simulation prediction methods, fast ships problems, slamming, long-term predictions, ship routeing. Computational fluid dynamics approaches to ship hydrodynamics – a short overview with selected applications.	
10. Assessment methods:	
11. Recommended reading:	

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: Introduction. What is CFD (Computational Fluid Dynamics) and why to use it? Basic concepts of fluid flow. Introduction to numerical methods. Finite difference methods. Finite volume methods. Solution of linear equation systems. Boundary and initial conditions. Methods for unsteady problems. Solution of the Navier-Stokes equations. RANS equations. Complex geometries. Turbulent flows. Compressible flow. Efficiency and accuracy improvement. Grid generation. Free-surface treatment. Selected industry applications. Cost and value aspects of CFD.	
10. Assessment methods:	
11. Recommended reading:	

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: Introduction to numerical methods of analysis of structural strength. Fundamentals of the finite element method: a concept of discretization of structure, stiffness and flexibility, stiffness matrix, transformation, joining elements, boundary conditions, loading vector, solution of equation system, evaluation of stresses. Principle of stationarity of potential energy, Rayleigh-Ritz method. Shape functions. Bar, beam and plain stress finite elements. C^0 , and C^1 elements. Equivalent nodal forces, patch test. Application of FE to stability analysis. Isoparametric formulation, numerical integration, static condensation, superelements. Review and specific features of finite element codes.	
10. Assessment methods:	
11. Recommended reading:	

1.Course title: SHIP STRUCTURAL MECHANICS

2. Code: 13-W-WTM-09/10	3. ECTS points: 4
4. Semester: summer	5. Hours per week
6. Language: English	7. Teaching method:
8. Name of the lecturer: dr Maciej Taczala	
9. Course contents: Kirchoff-Love thin plate theory, analytical solutions. Stiffened plates, structural orthotropy, effective width of plating. Plate finite elements. Theory of torsion of thin-walled beams – open and closed cross-sections. Overall strength of ship hull – bending, shear, torsion, ultimate capacity. Local strength: framework, grid, shell models – assumptions and computational methods. Stability of structural elements; plates and stiffeners, buckling modes, methods of analysis. Modelling of structural elements in the finite element method. Hierarchic models of hull structures. Fatigue analysis of structural elements of ship hull.	
10. Assessment methods:	
11. Recommended reading:	

1. Course title: SHIP HYDRODYNAMICS	
2. Code: 14-W-WTM-09/10	3. ECTS points: 4
4. Semester: summer	5. Hours per week
6. Language: English	7. Teaching method:
8. Name of the lecturer: dr Tomasz Abramowski	
9. Course contents: Introduction. Model tests – similarity laws. Full-scale tests. Propellers: geometry of propellers, momentum theory, propeller characteristics, cavitation, cavitation tunnel, open-water tests, propeller design procedure. Resistance and propulsion: interaction between ship and propeller, propulsive efficiency, decomposition of resistance, towing tanks and experimental approach, ITTC prediction method, additional resistance under service conditions. Ship maneuvering: maneuvering devices, rudders geometry and characteristics, rudder design, simulation of maneuvering, force coefficients, motion equations, shallow water and other influences, experimental approaches, ship full-scale trials at sea. Seakeeping: waves and seaway, ship motions in waves, simulation prediction methods, fast ships problems, slamming, long-term predictions, ship routeing. Computational fluid dynamics approaches to ship hydrodynamics – a short overview with selected applications.	
10. Assessment methods:	
11. Recommended reading:	



WINTER SEMESTER

1. Course title: CHEMICAL PROCESSES IN INORGANIC INDUSTRY AND ENVIRONMENTAL ENGINEERING I	
2. Code: WTilCh/IISt/TCh/D12-1	3. ECTS points: 4 ECTS
4. Semester: winter	5. Hours per week: L-15, C/CC-30, Lab.-45
6. Language: English	7. Teaching method: L, C/CC, Lab.
8. Name of the lecturer: prof. dr hab. inż. Maria Tomaszewska	
9. Course contents: Programme of lectures: Introduction to membrane processes. Definition of a membrane. Membrane processes. Preparation of polymeric membranes. Preparation of inorganic membranes. Characterization of membranes. Driving forces. Polarization phenomena and membrane fouling. Module and process design. Pressure driven membrane processes – microfiltration, ultra filtration, nanofiltration, reverse osmosis. Techniques with a concentration difference as a driven force – gas and vapour separation, pervaporation, dialysis, membrane distillation. Electrically driven membrane processes – electro dialysis. Examples of membrane processes application in chemical engineering. Programme of classes: <u>Classes</u> – heat effects of phase transformations and chemical reactions. Process concept choice. Material balances in simple unit operations, circle operations and side stream operations. Heat balances. <u>Laboratory</u> – 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.	
10. Assessment methods:	
11. Recommended reading: - Scott K., <i>Handbook of Industrial Membranes</i> , Elsevier Advanced Technology, Oxford, 1997. - Schafer A.I., Fane A.G., Waite T.D., <i>Nanofiltration</i> , Elsevier Advanced Technology, Oxford, 2005. - Becker P., <i>Phosphates and phosphoric acid</i> , Marcel Dekker, INC, New York, 1989. - Van Wazer J. R., <i>Phosphorus and its Compounds</i> , Interscience Publishers, INC., New York, 1958. - Lewis R.W., <i>Fundamentals of the finite element method for heat and fluid flow</i> , John Wiley and Sons, Chichester 2004. - Hocking M.B., <i>Modern Chemical Technology and Emission Control</i> , Springer-Verlag, Berlin 1985	

1. Course title: CHEMICAL PROCESSES IN INORGANIC INDUSTRY AND ENVIRONMENTAL ENGINEERING II	
2. Code: WTilCh/IISt/TCh/D12-7	3. ECTS points: 4 ECTS
4. Semester: winter	5. Hours: L-15, C/CC-30, Lab.-45
6. Language: English	7. Teaching method: L, C, Lab.
8. Name of the lecturer: dr inż. Zofia Lendzion-Bieluń	
9. Course contents: <u>Metallurgy</u> . Iron ores, pyrometallurgical process – pig iron obtaining: ores preparation, fluxing agents, introductory deoxidation, direct and indirect reduction processes, pig iron desulfurization, pig iron – composition and types. Steel-making – objectives and stages, steel refining, impurities removal. <u>Hydrometallurgy</u> . Copper ores, flotation, hydrometallurgical process stages, heat pretreatment – objectives and procedures. Extraction – extraction liquor, side reaction, separation of metals from	

<p>solutions – direct and indirect methods. <u>Building materials.</u> Lime, gypsum, cement, concrete, prefabricated products. <u>Ceramics:</u> ceramic building materials, electroceramics, metal ceramics, ceramic whiteware. <u>Glass and glassware.</u> Different sorts of glass, glass wool, ceramic and glass fibres, frits. <u>Electrolysis.</u> electrolyzers, Electrochemical synthesis of sodium hypochlorite, sodium chlorate, potassium chlorate. <u>Electroplating.</u> mechanism, structure of electrolytic coating, surface pretreatment, zinc, copper, nickel, chromium and gold plating.</p>
10. Assessment methods:
<p>11. Recommended reading:</p> <ul style="list-style-type: none"> - Campbell J., Castings, Elsevier Butterworth-Heinemann, Amsterdam 2004. - Brown D.V., Metallurgy basics, Van Nostrand Reinhold, New York 1983. - Hirschhorn J.S., Introduction to powder metallurgy, American Powder Metallurgy Inst., New York 1976. - Richardson F.D., Physical chemistry of melts in metallurgy, Academic Press, London 1974. - Boynton R.S., Chemistry and technology of lime and limestone, John Wiley, New York 1980. - Cement, Concrete, and Aggregates (ed. R.D. Hooton), ASTM International, West Consh., PA 2003. - Volf M.B., Chemical approach to glass, Elsevier, Amsterdam 1984. - Loewenstein K.L., The manufacturing technology of continuous glass fibres, Elsevier Scientific Publ.Co., Amsterdam 1973. - Hocking M.B., Modern Chemical Technology and Emission Control, Springer-Verlag, Berlin 1985

1.Course title: COMPUTER-AIDED DESIGN OF CHEMICAL INDUSTRIAL PLANTS	
2. Code: WTilCh/IIST/TCh/D12-5	3. ECTS points: 3 ECTS
4. Semester: winter	5. Hours: L-15, Lab.45
6. Language: English	7. Teaching method: L, Lab.
8. Name of the lecturer: prof. dr hab. inż. Ryszard J.Kaleńczuk	
9. Course contents:	
<p>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.</p> <p>Programme of classes: <u>Laboratory</u> – 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.</p>	
10. Assessment methods:	
11. Recommended reading:	

1.Course title: FUNDAMENTALS OF INORGANIC COMMODITY SCIENCE	
2. Code: WTilCh/IIST/TCh-D12-4	3. ECTS points: 2 ECTS
4. Semester: winter	5. Hours: L-15
6. Language: English	7. Teaching method: L
8. Name of the lecturer: dr inż. Krzysztof Lubkowski	
9. Course contents:	
<p>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.</p>	
10. Assessment methods:	
<p>11. Recommended reading:</p> <ul style="list-style-type: none"> - Hocking M.B., <i>Modern Chemical Technology and Emission Control</i>, Springer-Verlag, Berlin 1985. - Budde F., Farha G.A., Frankemolle H., <i>Value Creation: Strategies for the Chemical Industry</i>, Wiley-VCH, New York 2001. 	

- *The Chemical Industry at the Millennium: Maturity, Restructuring, and Globalization*, Peter H. Spitz (ed.), Chemical Heritage Foundation, New York 2003.
- *Industrial Minerals & Rocks: Commodities, Markets, and Uses*, J.E. Kogel, N.C. Trivedi, J.M. Barker, S.T. Krukowski (Eds), Society of Mining Metallurgy and Exploration, New York 2006.
- Feingenbaum A.V., *Total Quality Control – Engineering and Management*, Mc Graw-Hill Book, New York 1961.

1.Course title: SMALL SCALE PRODUCTS IN INORGANIC INDUSTRY

2. Code: WTilCh/IIST/TCh/D6-9

3. ECTS points: 2 ECTS

4. Semester: winter

5. Hours: L- 15

6. Language: English

7. Teaching method: L

8. Name of the lecturer: dr inż. Krzysztof Lubkowski

9. Course contents:

Inorganic pigments, sorbents, fillers, coagulants, silicon emulsions, silicon pastes, inorganic phosphorous compounds - characteristics, properties, methods of production, application.

10. Assessment methods:

11. Recommended reading:

- Hocking M.B., *Modern Chemical Technology and Emission Control*, Springer-Verlag, Berlin 1985.
- *The Chemistry of synthetic dyes and pigments*, H.E. Lubs (ed), Reinhold, New York 1955.
- *Pigment Handbook*, P.A. Lewis (ed.), John Wiley & Sons, New York 1988.
- Winkler, J., *Titanium Dioxide*, Vincentz Network, Hannover, 2003.
- *Industrial Inorganic Pigments*, G. Buxbaum, G. Pfaff (eds.), Wiley-VCH, Weinheim 2005.
- *High performance pigments*, H.M. Smith (ed), Wiley-VCH, Weinheim 2001.
- Wypych G., *Handbook of Fillers, The Definitive User's Guide and Databook of Properties, Effects and Uses*, Plastics Design Library, 1998.
- Jancar J., *Mineral fillers in thermoplastics: raw materials and processing*, Springer-Verlag, Berlin - Heidelberg 1999.
- Corbridge D.E.C., *Phosphorus: an outline of its chemistry, biochemistry and technology*, Elsevier Scientific Publ. Co., Amsterdam 1978.
- Yang R.T., *Adsorbents: fundamentals and applications*, John Wiley and Sons, Hoboken, 2003.

1.Course title:

TECHNOLOGIES FOR WASTE AND POLLUTANTS MINIMIZATION IN CHEMICAL INDUSTRY

2. Code: WTilCh/IIST/TCh/D12-2

3. ECTS points: 2 ECTS

4. Semester: winter

5. Hours: L-15

6. Language: English

7. Teaching method: L

8. Name of the lecturer: Joanna Grzechulska – Damszel PhD

9. 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.

10. Assessment methods:

11. Recommended reading:

Obligatory

- N. P. Cheremisinoff, *Handbook of Solid Waste Management and Waste Minimization Technologies*, Elsevier, 2003.
- B. Crittenden, S. Kolaczowski, *Waste minimization guide*, Institute of Chemical Engineers, UK, 1995.
- *Process engineering for pollution control and waste minimization / edited by Donald L. Wise, Debra J. Trantolo*, Marcel Dekker, New York, 1994.

Additional/optional

- P.N. Cheremisinoff, L.M. Ferrante, *Waste Reduction for Pollution Prevention*, Butterworth-Heinemann Ltd, Linacre House, Jordan Hil, Oxford OX2 8DP, 1992.

1.Course title: TESTING METHODS OF INORGANIC PRODUCTS

2. Code: WTilCh/IIST/TCh/D12-3

3. ECTS points: 5 ECTS

4. Semester: winter

5. Hours: L-45, Lab.-60

6. Language: English	7. Teaching method: L. Lab.
8. Name of the lecturer: dr inż. Dariusz Moszyński	
9. Course contents: Programme of lectures: <u>Instrumental methods of chemical composition analysis.</u> Selecting of a proper analytical methods (detection levels, sample preparing). Atomic spectra methods. Theoretical basics of atomic spectroscopy. Inductively Coupled Plasma, ICP. Atomic absorption spectroscopy, AAS. Molecular spectra method. Infrared Spectroscopy, IR, Raman Spectroscopy RS. X-ray methods. X-Ray Fluorescence, XRF. X-Ray Microanalysis (electron sound). <u>Chemical analysis of the surface of solid state.</u> Physicochemical basics of Electro-spectroscopy methods. Methods: Electron Spectroscopy for Chemical Analysis, ESCA, including X-ray Photoelectron Spectroscopy, XPS, and Ultraviolet Photoemission Spectroscopy, UPS; Auger Electron Spectroscopy, AES, Electron Energy Loss Spectroscopy, EELS. <u>Adsorption/desorption methods and temperature programmed techniques.</u> Thermogravimetry, TG, Temperature Programmed Desorption, TPD, Temperature Programmed Oxidation, TPO, Temperature Programmed Reduction, TPR, Temperature Programmed Surface Reaction, TPSR. Mass spectrometry. Mass Spectrometry combined with gas chromatography and temperature programmed techniques. <u>Analysis of phase composition, structure and topography.</u> X-Ray Diffraction, XRD, Reflection High Energy Electron Diffraction, RHEED, Low Energy Electron Diffraction, LEED. Mössbauer Spectroscopy. Scanning Electron Microscopy, SEM, and Transmission Electron Microscopy, TEM (including characteristic X-ray and EELS for microanalysis). Tunnel Electron Microscopy, Atomic Force Microscopy, AFM. 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: - John A. Dean, Analytical Chemistry Handbook, McGraw-Hill Companies, 2000. - Burkhard Beckhoff, H. Wolff, N. Langhoff, R. Wedell, B. Kanngießer, Handbook of Practical X-Ray Fluorescence Analysis, Springer-Verlag New York, LLC, 2005. - Helmut Günzler, Alex Williams, Handbook of Analytical Techniques, Wiley-VCH, 2001. - S Amelinckx, Handbook of Microscopy: Applications in Materials Science, SolidState Physics, and Chemistry Applications: Applications in Materials Science, Solid-state Physics and Chemistry: Applications, Wiley VCH, 1996.	

1.Course title: TECHNOLOGICAL PROJECT	
2. Code: WTilCh/IIST/TCh/D12-6	3. ECTS points: 2 ECTS
4. Semester: winter	5. Hours: P-30
6. Language: English	7. Teaching method: P
8. Name of the lecturer: dr hab. inż. Marek Gryta, prof. nadzw. PS	
9. Course contents: The students accomplish the technological project concerning a given subject: a description of technological concept, a block diagram of assumed manner of its realization, selection and description of used raw materials, characteristic of obtained products, description of wastes and a proposal of their management, flow diagram with description of control measurement instruments, fundamental project calculations, mass balance calculations and Sankey's diagram.	
10. Assessment methods:	
11. Recommended reading: Obligatory -C.A. Heaton, Industrial Chemistry, Blackie and Sons, Glasgow 1991 - Lees' Loss Prevention in the Process Industries, Vol.1-3 (3 rd Ed.)ed. By Mannau S., Elsevier 2005 - D.L. Wise, D. Trantdo, Process engineering for pollution control and waste minimization, Marcel Dekker, New York 1994 Additional/optional: - CRC Handbook of Chemistry and Physics, 87 th ed., 2006-2007, Taylor & Francis 2006 - KIRK-OTHMER Encyclopedia of Chemical Technology, 5th ed., John Wiley & Sons, 2004 - Hewitt G.F., Handbook of Heat Exchanger Design, Hemisphere Pub., Washington DC 1990	

 SUMMER SEMESTER

1.Course title: POWER ENGINEERING IN CHEMICAL INDUSTRY	
2. Code: WTilCh/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. Heat transfer medium in chemical industry: low and high pressure steam, organic liquids, silicone oils, air, water, brines. Methods of heat generation. Fuel combustion. Electric and exhaust gas heating. Water for steam boilers and coolant circuit. Solid and liquid wastes, pollution emission. Cooling. Cooling tower and others methods of cold production. Heat exchangers. Heat of reactions. Heat exchange in an exemplary technological process. Search for new sources of energy. Non-conventional sources of energy.	
10. Assessment methods:	
11. Recommended reading:	
Obligatory	
- Porritt J., Energy and the environmental, Oxford University Press, Oxford 1993	
- Barid C., Environmental chemistry, Freeman and Company, New York 1998	
- Powell S.T., Water conditioning for industry, McGraw-Hill, New York, 1954	
- Heaton C.A., Industrial Chemistry, Blackie and Sons, Glasgow 1991	
- Hewitt G.F., Handbook of Heat Exchanger Design, Hemisphere Pub., Washington DC 1990	
- L. Anderson. D.T. Uman, Fuels from wastes, London, 1977	
Additional/optional	
- KIRK-OTHMER Encyclopedia of Chemical Technology, 5th ed., John Wiley & Sons, 2004	
- K. Scott, Handbook of industrial membranes, Elsevier, Kidlington (UK) 1997	
- D.L. Wise, D. Trantdo, Process engineering for pollution control and waste minimization, Marcel Dekker, New York 1994	
- N.I. Sax, Industrial Pollution, VNR, Melbourne, 1974	
- Block H.P., Practical lubrication for industrial facilities, Marcel Dekker, New York 2000	
- L.D. Smoot, P.J. Smith, Coal combustion and gasification, Plenum Press, London 1985	

1.Course title: QUALITY AND RISK MANAGEMENT IN CHEMICAL INDUSTRY	
2. Code: WTilCh/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: History of quality management in enterprises. Idea of complex quality in enterprise. Techniques of products control. Systems of quality management consistent with standards of ISO series. A role of procedures in the systems of quality managements. A way to achieve a certificate of compliance with ISO standards. Systems of environment management and industrial safety. General hazards resulting from utilization of installation in chemical industry: protection of machines and devices, fire protection and against explosions sources of ignition, self ignition, ignition of gaseous mixtures, explosive limit, of gaseous mixtures, the influence of technological parameters on explosive limits. Evaluation of fire hazard of constructional materials, self-igniting substances. Operation with dangerous liquids, internal transport, lighting and colours in work protection, electric energy versus industrial safety. Problems of ventilation. Storage and transport of chemicals and dangerous substances. The duties of employer in relation to performance of investigations and measurements of chemical factors in work environment.	
10. Assessment methods:	
11. Recommended reading:	
- KIRK-OTHMER Encyclopedia of Chemical Technology, 5 th ed., John Wiley & Sons, 2004.	

1. Course title: NANOTECHNOLOGY AND CRYSTALLINE NANOMATERIALS	
2. Code: WTilCh/IISl/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-Paleń	
9. Course contents: Introduction to nanotechnology. Morphology of different carbon nanostructures and crystalline nanomaterials. Preparation techniques of nano-sized materials. Size effect in properties of materials. Characterization of nanomaterials. Examples of application of nanomaterials in industry.	
10. Assessment methods:	
11. Recommended reading: - W.A. Goddard, D.W. Brenner, S.E. Lyshevski, G. J. Lafrate, „Handbook of nanoscience, engineering and technology”, CRC Press LLC 2003. - M.D. Ventra, S. Evoy, J.R. Heflin, “Introduction to nanoscale science and technology”, Springer 2004.	

IV. Useful information

1. About Szczecin

Szczecin lies in north-west Poland at 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. It 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 from the Polish-German border and ca. 100 km from the Baltic Sea ferry terminals, Szczecin is an easy target.

Travelling by plane:

▪ arrival in Berlin (international airports Tegel or Schönefeld; ca. 150 km from 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/>

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/>

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 from 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't 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/>

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/>

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/>

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

Gold Taxi

<http://www.taxi.szczecin.pl/indexen.htm>

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

<http://www.multikino.pl/szczecin/>

Pionier 1909

<http://www.kino-pionier.com.pl/>

Helios Szczecin

<http://www.heliosnet.pl/23,Szczecin/StronaGlowna/>

Theatres

Opera na Zamku

ul. Korsarzy 34, 70-540 Szczecin

<http://www.opera.szczecin.pl/>

Teatr Współczesny

ul. Wały Chrobrego 3, 70-500 Szczecin

<http://wspolczesny.szczecin.pl/>

Teatr Polski

ul. Swarożyca 5, 71-601 Szczecin

<http://www.teatrpolski.szczecin.pl/>

Teatr Kameralny

Szczecińskiego Towarzystwa Przyjaciół Sztuki

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

<http://www.teatrkameralny.lap.pl/>

Art galleries and museums

Muzeum Narodowe

ul. Staromłyńska 27, 71-561 Szczecin

<http://www.muzeum.szczecin.pl/>

Muzeum Zamku Książąt Pomorskich

ul. Korsarzy 34

70-540 Szczecin

tel. (0-91) 489-16-30

fax (0-91) 434-79-84

www.zamek.szczecin.pl/pl/historia/muzeum.asp

e-mail: cikit@zamek.szczecin.pl

Galeria Sztuki Współczesnej

ul. Staromłyńska 1

70-561 Szczecin

tel. (0-91) 431-52-36

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>

Universum Fitness Club

Al. Wojska Polskiego 39a, Szczecin
<http://www.fitnessuniversum.pl/>

CSR ACTIVE FILIA CHR KUPIEC

ul. Krzywoustego 9-10, 70-250 Szczecin
<http://www.active-fitness.pl/>

Planet Spa

al. Wojska Polskiego 70,
<http://www.planetspa.szczecin.pl/>

Yoga

Szkoła Jogi Klasycznej

ul. Niedziałkowskiego 26a (vis-a-vis TVP
Szczecin), 71-410 Szczecin
<http://www.jogaklasyczna.pl/>

Szkoła Jogi Jurka i Ałty Jaguckich

ul. Bogusława 3 deptak, III piętro 70-440
Szczecin
<http://www.yoga.szczecin.pl/>

Tenis

Szczeciński 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/>

Swimming

Szczeciński 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 (Pomorzany)
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/>

Quiero Salsa

<http://www.quierosalsa.pl/>

DK Dance

<http://www.dkdance.pl/>

ALMA Flamenco

<http://www.flamenco.szczecin.pl/>

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 Królewska

- Cmentarz Centralny

- Stare Miasto –Old Town

- Park Kasprowicza – Kasprovicz's Park with
Pope Statue

13. Szczecin in the internet

For all the Szczecin cultural information please go to:

<http://www.infoludek.pl/>

<http://szczecin.eu/en/>

<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

dr Daniel Polasik,

E-mail: daniel.polasik@biot.ar.szczecin.pl
ul. Doktora Judyma 6, 71-460 Szczecin
Tel. + 48 91 449 67 80

Faculty of Chemical Engineering

Dean: dr hab. inż. Jacek Soroka, prof. ZUT

al. Piastów 42, 70-065 Szczecin
tel.: + 48 91 434 30 86
fax.: + 48 91 449 46 36
<http://www.wtiich.zut.edu.pl/>

Faculty Erasmus Coordinator

prof. Urszula Narkiewicz,

E-mail: Urszula.Narkiewicz@zut.edu.pl
Ul. Puławskiego 10, 70-322 Szczecin
Tel.: +48 91 449 46 87, fax.: +48 91 449 46 86

**Faculty of Computer Science and
Information Technology**

Dean: dr hab. inż. Antoni Wiliński, prof. nadzw. ZUT

ul. Żołnierska 49, 71-210 Szczecin
tel.: + 48 91 449 56 70, +48 91 449 55 18
fax.: + 48 91 487 08 42
<http://wi.zut.edu.pl/>

Faculty Erasmus Coordinator

dr Anna Tomaszewska,

E-mail: atomaszewska@zut.edu.pl
ul. Żołnierska 49, 71-210 Szczecin
tel.: +48 91 449 55 60

Faculty of Electrical Engineering

Dean: dr hab. inż. Stefan Domek, prof. nadzw. ZUT

ul. Sikorskiego 37, 70-313 Szczecin
tel.: + 48 91 449 41 50
tel./fax.: + 48 91 434 09 26
<http://www.we.zut.edu.pl/>

Faculty Erasmus Coordinator

dr Krzysztof Penkala,

E-mail: penkala@ps.pl
ul. 26 Kwietnia 10, 71-126 Szczecin
tel.: +48 91 449 52 12, fax.: +48 91 449 52 49

Faculty of Mechanical Engineering and Mechatronics

Dean: prof. dr hab. inż. Stefan Berczyński

al. Piastów 19, 70-310 Szczecin
tel.: + 48 91 489 16 35
fax.: + 48 91 449 45 50
<http://www.wimim.zut.edu.pl>

Faculty of Maritime Technology

Dean: dr hab. inż. Bogusław Zakrzewski, prof.
nadzw. ZUT

al. Piastów 41, 71-065 Szczecin
tel.: +48 91 449 47 71
fax.: + 48 91 449 47 37
<http://www.wtm.zut.edu.pl/>

Faculty of Environmental Management and Agriculture

Dean: prof. dr hab. Aleksander Brzóstowicz

ul. J. Słowackiego 17, 71-374 Szczecin
tel.: +48 449 62 00
<http://www.agro.zut.edu.pl/>

Faculty of Food Sciences and Fisheries

Dean: [prof. dr hab. Waldemar Dąbrowski,
prof.zw.](mailto:prof.dr.hab.Waldemar.Dabrowski.prof.zw)

ul. Kazimierza Królewicza 4, 71-550 Szczecin
tel.: + 48 91 449 66 54
fax.: + 48 91 449 66 57
<http://www.wnozir.zut.edu.pl/>

Faculty of Economic and Organisation of Food Economy

Dean: dr hab. Grażyna
Karmowska prof. nadzw.

Ul. Żołnierska 47, 71-210 Szczecin
tel.: +48 91 449 69 00
<http://www.ekonomia.zut.edu.pl>

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Faculty Erasmus Coordinator

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tel. 091 449 66 66

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tel.+ 48 91 487 69 71-5 wew. 344,
fax.: + 48 91 487 71 50