

INSTITUTIONAL INFORMATION

Legal name and address of the institution	Politechnika Opolska/ Opole University of Technology 76 Prószkowska str. 45-758 Opole, Poland
Erasmus+ code of the institution	PL OPOLE02
Erasmus+ university charter	74388-IC-1-2007-1-PL-ERASMUS-EUCX-1
Official representative of the institution (bilateral agreements)	Prof. Krzysztof Malik, Vice-Rector for Students and Investments
Erasmus+ institutional coordinator	Elżbieta Cieślak, M.Sc. e.cieslak@po.opole.pl Tel: +48 77 449 8516
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Erasmus+ Contact Person	Marta Dębowska, M.A. m.debowska@po.opole.pl 5 Mikołajczyka str. 45-271 Opole tel. +48 77 449 85 14
Website	https://dwm.po.opole.pl
Erasmus+ Faculty Coordinators	
Faculty of Civil Engineering and Architecture	Juliusz Kuś, PhD j.kus@po.opole.pl
Faculty of Electrical Engineering, Automatic Control and Informatics	Łukasz Dzierżanowski, PhD l.dzierzanowski@po.opole.pl
Faculty of Mechanical Engineering	Małgorzata Wzorek, Assoc. Prof. m.wzorek@po.opole.pl
Faculty of Physical Education and Physiotherapy	Daria Hołodnik, PhD d.holodnik@po.opole.pl
Faculty of Production Engineering and Logistics	Hanna Ściegosz, PhD h.sciegosz@po.opole.pl
Faculty of Economics and Management	Roman Śmietański, PhD r.smietanski@po.opole.pl
Information on ECTS	https://dwm.po.opole.pl/index.php/en/ [go to: Admission procedures, ECTS] The courses for Erasmus+ students are conducted in English, German, Italian and Russian
Deadline for sending Erasmus student applications	Winter semester: 15th June Summer semester: 15th December Required documents*: - Application Form - Learning Agreement - Accommodation Form *Available on the website.

Faculty of Civil Engineering and Architecture	
48 Katowicka str., 45-061 Opole, Poland phone: (+48 77) 4498560 e-mail: wbia@po.opole.pl, http://www.wbia.po.opole.pl	
FIELDS OF STUDY	- Civil Engineering; (BSc, MSc, PhD) - Architecture (BSc)
FACULTY DEPARTMENTS	- Department of Civil Engineering and Urban Planning - Department of Materials Physics - Department of Mechanics and Structural Engineering - Department of Building Materials Engineering - Department of Geotechnics and Geodesy - Department of Roads and Bridges - Department of Civil and Process Engineering
FACULTY ERASMUS COORDINATOR	Juliusz Kuś, PhD; e-mail: j.kus@po.opole.pl

Scientific research conducted at Faculty of Civil Engineering and Architecture includes such unique and vital issues as: mechanics of building structures, seismic and wind engineering, thermal affects on building structures, fire resistance of building structures, thermomechanics, interaction of building structures with subsoil, contemporary issues of building structures physics, building materials engineering in the field of composite materials based on cement and gypsum binding agents, and utilization of industrial waste materials in building materials industry. The academic staff of the Faculty has proved to have significant potential of scientific research, which enables them to conduct research within the fields mentioned above at highest possible standards. This has been confirmed by their achievements recognized both nationwide and worldwide, their active participation in numerous national and foreign scientific conferences as well as their scientific output represented by a plentiful supply of domestic and foreign publications. As far as scientific research is concerned, Faculty of Civil Engineering and Architecture collaborates with a number of technical universities from Austria, the Czech Republic, Germany, Russia, Slovakia, Italy, and Ukraine. The researchers conduct extensive joint research work in partnership with their colleagues from Milan, Vienna, Stuttgart, Dresden, Bochum, Lvov, Prague, Brno, Ostrava, and Bratislava. The outcome of this collaboration is a wide range of joint seminars and scientific publications.

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Course code	Course name	ECTS credits
B001	Building Materials	4
B002	Concrete Bridges	6
B003	Concrete Structures	5
B004	Computer science in Engineering	5
B005	Foundation Engineering	4
B006	Principles of Town Planning and Architecture	5
B007	Introduction to Seismic Engineering	6
B008	Soil Mechanics	5
B009	Strength of Materials	6
B010	Structural Mechanics I	6
B011	Steel Bridges	5
B012	Environment Protection in Transportation Engineering	4
B013	Road Communication Engineering	6
B014	Transport Engineering I	6
B015	Engineering Surveying	4
B016	Fundamentals of Structural Dynamics	6
B017	Programming of Numerical Methods in MATLAB	6
B018	Hydraulics and hydrology	4
B019	Design Work-Individual Project	4
B020	Fluid Mechanics	4
B021	Steel Structures	6
B022	Engineering Structures	6
B023	Structural Mechanics II	6
B024	Individual Project Design	4
B025	Architectural Design II - Single family housing design	7
B026	Computer Methods in Structural Mechanics	5
B027	Theory of Elasticity and Plasticity	6
B028	Transport Engineering II	6
B029	Shell and thinwalled Structures	6
B031	Architectural Design VII	7
B032	Security, hygienics and first aid in the building enterprise	4
B033	Final Thessis	20
B034	Revitalisation of post industrial areas	8
B035	Traffic Engineering	4
B036	Underground engineering	4
B037	Urban Communications	4
B038	Construction and Maintenance of Roads and Bridges	4
B039	Design of airports	4
B040	Design of earthen structures in communication buildings	4
B041	Design of parkings	4
B042	Road materials	4
B043	Road traffic safety	4
B044	Theory of road surfaces dimension	4
B045	Geology	6
B046	Architectural Design IV	6

Faculty of Electrical Engineering, Automatic Control and Informatics	
76 Prószkowska str., 45-758 Opole, Poland phone: (+48 77) 4498699 e-mail: weia@po.opole.pl, http://www.we.po.opole.pl	
FIELDS OF STUDY	- Biomedical Engineering; (BSc) - Industrial Electronics; (BSc) - Electrical Engineering; (BSc, MSc, PhD) - Automatic Control and Robotics; (BSc, MSc, PhD) - Computer Engineering; (BSc, MSc) - Renewable Engineering Technologies; (BSc, MSc)
FACULTY DEPARTMENTS	- Department of Power, diagnostics and computer engineering - Department of Control Systems and Industrial Automatics - Department of Computer Systems - Department of Intelligent Automatics Systems - Department of Electronics and metrology - Department of Computer Control Systems - Department of Electric Power - Department of High Voltage and Materials Engineering - Department of Renewable Energy Sources - Department of Biomedical Engineering - Department of Parallel Systems and Artificial Intelligence - Department of Electrical Machines - Department of Electrical Drives and Industrial Electronics - Department of Robotics and Informatics Application - Department of Electrical Engineering and Mechatronics
FACULTY ERASMUS COORDINATOR	Łukasz Dzierżanowski, PhD; e-mail: l.dzierzanowski@po.opole.pl

Faculty of Electrical Engineering, Automatic Control and Informatics came into being in 1966, when - due to social initiative - Higher School of Engineering in Opole was established on 1st June. In 2006 the name of the Faculty of Electrical Engineering and Automatic Control was amended to the Faculty of Electrical Engineering, Automatic Control and Computer Science. The Faculty of Electrical Engineering, Automatic Control and Computer Science seeks to provide an optimum environment for research and scholarly efforts of academic staff members and students in the fields of electrical, electronic, control and computer engineering. The Department offers a wide range of undergraduate and postgraduate study opportunities, both full- and part-time, which lead to the degrees of BSc, MSc and PhD. The BSc and MSc require satisfactory completion of examined lecture courses as well as preparation and oral defense of a dissertation. The BSc and MSc can be conferred in the fields of electrical engineering, computer engineering, control and robotics, electronics and telecommunication and technical science education. The PhD is a research degree, can be granted in the field of electrical engineering or control and robotics, on a basis of oral defense of a doctoral dissertation. Lectures are basically given in Polish, but a bilingual, Polish-German BSc/MSc programme has also been conducted and it is still offered in computer engineering.

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Course code	Course name	ECTS credits
E001	Agile management of IT projects	4
E002	Algorithm Design	5
E003	Antennas and Wave Propagation	6
E005	CAD I - lecture	4
E006	CAD I - lab	4
E007	CAD II	4
E008	CAD III	4
E009	Circuit Theory	8
E010	Computer Management Systems	5
E011	Data Base I	6
E012	Data Structures	5
E013	Designing of data bases	5
E014	Digital Signal Processors	4
E015	Digital Visualisation - lecture	4
E016	Digital Visualisation - project	4
E018	Electrical and Electronic Metrology	5
E019	Electromagnetic Field Theory	5
E020	Electronic Circuits	4
E021	Embedded Systems	2
E022	Final Project	7
E023	Hardware Development in Personal Computers	5
E024	High Voltage Electrical Equipment Diagnostics	4
E025	Image Processing in Computer Forensics	4
E026	Information Technology	4
E027	Internet Technology	6
E028	Introduction to Computer Forensics	4
E029	Introduction to Cybersecurity	4
E030	Introduction to Networks	4
E031	Mathematical Modeling	4
E032	Microprocessors technology - Lecture	4
E033	Microprocessor Technology - laboratory	4
E034	Mobile robots	5
E035	Network Operating Systems Administration	5
E036	Object Programming for CAD	4
E037	Operating Systems I	4
E038	Operating Systems II	5
E039	Power Electronics I	4
E040	Programming Graphic Applications	4
E041	Renewable Energy Sources	5
E042	Routing and Switching Essentials	4
E043	Software Engineering	7
E044	Specialized Programming Languages	4
E045	Statistical Inference and Operational Research	7
E046	Telecommunication networks and systems	5
E047	Introduction to Algorithm Design	5

E048	System programming: Concurrent and Distributed Systems	5
E049	Expert systems for automatic control	4

Faculty of Mechanical Engineering	
5 Mikołajczyka str., 45-271 Opole, Poland phone: (+48 77) 4498482 e-mail: wmech@po.opole.pl, http://wm.po.opole.pl	
FIELDS OF STUDY	- Mechanical Engineering (BSc, MSc, PhD) - Power engineering (BSc) - Chemical and Process Engineering (BSc) - Environmental Engineering (BSc, MSc) - Mechatronics (BSc, MSc) - Transport (BSc)
FACULTY DEPARTMENTS	- Department of Process Engineering - Department of Environmental Engineering - Department of Mechanics and Machine Design - Department of Road and Agricultural Vehicles - Department of Thermal Engineering and Industrial Facilities - Department of Manufacturing Engineering and Automation
FACULTY ERASMUS COORDINATOR	Małgorzata Wzorek, Assoc. Prof.; e-mail: m.wzorek@po.opole.pl

The Faculty of Mechanical Engineering is a modern research unit of Opole University of Technology which has a half century of tradition. It is a well-equipped research and education center with nationwide importance, strong links with industry, and very good international collaboration. We are among the most prestigious units in the country.

We invite you to study at the Faculty of Mechanical Engineering!!! This is an invitation to reach out for a very good general education that simplifies constant development by gaining new skills, and reaching out for thorough technical knowledge and specialised education.

The Faculty of Mechanical Engineering offers 3 semester MSc studies: Environmental Engineering in the specialization: Advanced Technologies in Environmental Engineering (ATEE).

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Course code	Course name	ECTS credits
M001	Mechanics	5
M002	Machine Design	6
M003	Machine Life	5
M004	Materials science	4
M005	Strength of Materials	6
M006	Mechanics Elements and Machines Design	5
M007	Structural Mechanics in Machine Design	6
M008	Simulation in Machine Dynamics	6
M009	Steel Structures	6
M010	Structural Design	5
M011	Welding	4
M012	Hydraulic Machines	4
M013	Fluid Mechanics	6
M014	Technology of manufacturing	4
M015	Engineering Vibration Analysis of Mechanical Systems	4
M016	Measurement Method in Mechanical Engineering	4
M017	Computer Measurement Systems	4
M018	Computer Aided Design	6
M019	Auto CAD basics	5
M020	Advanced CAD/CAE design	4
M021	Dynamics of the vehicle	4
M022	Programming in MATLAB	4
M023	Computer aided programming of the CNC machine tools	4
M024	Information Technology (IT) in Engineering	4
M025	Graphical programming in mechatronic systems	5
M026	Electrical Engineering and Electronics	5
M027	Combustion engines	5
M028	Informatics	6
M029	Building Structures	6
M030	Technology, economy and organisation of building site	5
M031	Building structures-docks and coasts	6
M032	Basic of Automatics	4
M033	Statistics	4
M034	Basics of ecology	4
M035	Environmental Chemistry	5
M037	Environmental Analytics	5
M038	Water Technology	6
M039	Wastewater treatment	4
M040	Industrial Wastewater	4
M041	Technical Systems of Sanitary	4
M042	Modeling of Water Distribution Systems	6
M043	Hydrology and Hydraulics	4
M044	Meteorology and Climatology	4
M045	Air Pollution Control	6
M046	Pollution Diffusion in Atmosphere	6

M047	Waste management	4
M048	Environmental Engineering	4
M049	Applications of Geographic Information Systems (GIS)	4
M050	Noise measurement and control	4
M051	Building energy audit	4
M052	Applied Computer Image Analysis	6
M053	Fuels Combustion in Industry	4
M054	Alternative Energy Sources	5
M055	Applied Thermodynamics	6
M056	Energy and Environmental Analysis and Prefeasibility Studies	5
M057	Modeling of Energy Systems	5
M058	Heating Systems	5
M059	Heat Transfer	6
M060	Heat and Mass Transfer Operations	6
M061	Processes and Technology of Production	4
M062	Process Engineering	6
M063	Selected Elements of Process Engineering	6
M064	Mechanical Operations	4
M065	Bioprocess Engineering	6
M066	Engineering of Reactors	6
M067	Design Work - Installation for Solution Production	6
M068	Design Work - Installation for gas cooling and humidification	6
M069	Membrane Processes	4
M070	Process Flow Systems	4
M071	Extraction	4
M072	Distillation and Rectification	6
M073	Sustainable Development for Engineers	4
M074	Spatial Planning and Urban Design	4
M075	Basics of Business Entities of Economy	4
M076	Organization of Agricultural Production and Services	4
M077	Final project	15

Faculty of Physical Education and Physiotherapy	
76 Prószkowska str., 45-758 Opole, Poland phone: (+48 77) 4498250 e-mail: wwif@po.opole.pl, http://www.wwif.po.opole.pl	
FIELDS OF STUDY	- Physiotherapy (BSc, MSc) - Physical Education (BSc, MSc) - Tourism and Recreation (BSc, MSc)
FACULTY DEPARTMENTS	- Department of Biological Sciences - Department of Biochemistry and Physiology - Department of Basics of Physiotherapy - Department of Clinical Physiotherapy - Department of Humanistic Sciences - Department of Physical Education Methodology - Department of Sports - Department of Biomechanics - Department of Anthropomotorics - Department of Active Forms of Tourism and Recreation - Department of Tourism and Health Promotion - Department of Geography and Tourism Economics
FACULTY ERASMUS COORDINATOR	Daria Hołodnik, PhD; e-mail: d.holodnik@po.opole.pl

Faculty of Physical Education and Physiotherapy at Opole University of Technology derived from the unit of Physical Education and Sport operating in the institution since 1968. The motto of Faculty of Physical Education and Physiotherapy is "Physical activity determines man's fitness and health". The faculty integrates academic teachers, physiotherapists and enthusiasts of tourism and recreation from all over the region. Students may follow their academic career on 1st and 2nd cycle studies. In order to improve the quality of teaching, the faculty commenced cooperation with leading medical centers, as well as with scientific companies from Poland and Europe. The scope of the research involves a wide range of issues and studies on patients suffered from various diseases, amateur athletes and professional players of handball, football, hockey, basketball, and also swimmers, athletes, short track, cyclists, etc. With a special focus on: level of training, adaptation capacity to a physical effort, level of a physical efficiency, ability to undertaking defined level of physical effort, prospect on physical development, studies of balance. Researchers represent various areas of science - biomechanics, biochemistry and specialization - teachers of PE, instructors and coaches. The research conducted in the units has been granted with an approval from Committee of Bioethics.

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Course code	Course name	ECTS credits
F01	Disabled sports	3
F02	Kinesiotaping	3
F03	Prosthetics and Orthotics	3
F04	Adaptive Physical Activity	3
F05	Clinical Physiotherapy in Neurology	3
F06	Practical Training	6
F07	Functional Diagnostics and Rehabilitation Programming in Rheumatology	3
F08	Therapeutic Massage	4
F09	Adapted Sport and Recreational Physical Activity	3
F10	Clinical Reasoning and ICF Model Based Rehabilitation	3
F11	Neurorehabilitation	3
F12	Orthopaedic and Sport Rehabilitation	3
F13	Human motion analysis in physiotherapy practice	2
F14	Lymphatic drainage	3
F15	Physiotherapy in gynecology and obstetrics	3
F16	Physiotherapy in oncology	3
F17	Alternative diagnostics and therapeutics methods in physiotherapy	3
TR01	Marketing	5
TR02	Tour Guiding	3
TR03	Comercial Clinic Management	5
TR04	Hotel Management and Service Excellence	3
TR05	Tourism Product	3
TR06	Agro and Ecotourism	3
TR07	Management	5
TR08	Economics	5
TR09	Managing a Travel Busienss	5
TR10	Marketing of Tourism and Leisure	4
TR11	Travel Consultancy	4
TR12	Alternative Health Coaching	3
TR13	Psychologie	3
TR14	Einführung in die Philosophie	2
TR15	Introduction to Philosophy	2
TR16	Psychology	2
TR17	Nutrition and supplementation in sport	3
WF01	Theory and Methodology of Team Sport - Volleyball	3
WF02	Theory and Methodology of Individual Sports - Swimming	5
WF03	Didactics of Physical Education	3
WF04	Summer Training Camp	5
WF05	Theory and Methodology of Team Sport - Basketball	3
WF06	Human Kinetics/ Anthropomotrics	3
WF07	Theory and Methodology of Individual Sports - Gymnastics	3
WF08	Health Education	4

Faculty of Production Engineering and Logistics	
31 Sosnkowskiego str., 45-272 Opole, Poland phone: (+48 77) 4498744 e-mail: wipil@po.opole.pl, http://www.wipil.po.opole.pl	
FIELDS OF STUDY	- Management and Production Engineering (BSc, MSc) - Logistics (BSc, MSc) - Security Engineering (BSc) - Food Technology and Human Nutrition (BSc)
FACULTY DEPARTMENTS	- Department of Mathematics and IT Applications - Department of Physics - Department of Engineering and Work Safety - Department of Logistics - Department of Applications of Chemistry and Mechanics
FACULTY ERASMUS COORDINATOR	Hanna Ściegosz, PhD; e-mail: h.sciegosz@po.opole.pl

Faculty of Production Engineering and Logistics was created on the basis of the Institute of Mathematics, Physics and Chemistry. The Institute was founded in 1975 as an interfaculty unit whose objective was to conduct research as well as didactic classes of mathematics, physics and chemistry in all fields and courses of studies (first at Higher School of Engineering, afterwards at Opole University of Technology). Currently the faculty has been performing above mentioned tasks, though it has broadened its didactic offer effectively. Faculty research and didactic employees conduct classes of not only basic subjects like mathematics, algebra with geometry, mathematical analysis, physics and chemistry but also of numerical methods, mathematical statistics, calculus of probability, operational research, computer science, selected programming languages, databases, logistics, computer networks and philosophy of nature. Furthermore, didactic offer has been significantly enriched since the creation of the Institute by extending the scope of subjects connected with work environment engineering, logistics and production engineering as well as subjects concerning teaching technology and computer science at schools and selected technical subjects.

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Course code	Course name	ECTS credits
T001	Algebra and Analytical Geometry	6
T002	Chemistry	5
T003	Differential Equations	5
T004	Ecology	4
T005	Engineering Graphics	5
T006	Entrepreneurship for Engineers	4
T007	Fundamentals of Management	6
T008	Industrial Marketing	4
T009	Innovation Management	4
T010	Logistics and Supply Chain Management	5
T011	Managing the Service Quality	4
T012	Marketing	4
T013	Mathematical Modeling in Technology	4
T014	Mathematics I	6
T015	Mathematics II	4
T016	Mathematics III	6
T018	Professional Ethics	4
T019	Project Management	4
T020	Quality Management	7
T021	Quality Management of Production	4
T022	Statistics	6
T023	Project Team Management	4
T024	Control Theory	4
T026	Operational Research	6
T027	Mathematical Statistics	6

Faculty of Economics and Management	
7 Luboszycka str., 45-036 Opole, Poland phone: (+48) 77 449 88 00 e-mail: weiz@po.opole.pl, http://www.weiz.po.opole.pl	
FIELDS OF STUDY	- Management (BSc, MSc) - International Economics Relations (BSc) - Administration (BSc) - Economics (BSc, MSc)
FACULTY DEPARTMENTS	- Department of Organization and Business Management - Department of Humanities and Law - Department of Regional Policy - Department of Economics, Finance and Regional Research - Department of International Economic Relations - Department of Intellectual Property, Administrative and European Law - Department of E-Business and Electronic Economy
FACULTY ERASMUS COORDINATOR	Roman Śmiałowski, PhD; e-mail: r.smietanski@po.opole.pl

The Faculty of Economics and Management currently offers a broad range of studies on both Bachelor and Master degrees. The majority of the academic staff participates in research projects which are mostly conducted under statutory research programmes as well as the Faculty's own programmes. The Faculty's main research activities are concentrated on: sustainable socio-economic and ecological growth in regional development, system transformation influence on demographic situation and education of human capital in the Silesia region, conditions of balanced regional development in Poland following European Union accession (particularly external migration processes and Opole region), mathematic aid in regional development programming, the role of work resources in the formation of Silesia region competitiveness, seasonal migrations from the Silesia region to the European Union countries (diagnosis and forecast), selected problems of European Union law, particularly Common Foreign Policy and European Union security, marketing and logistics integration – premises, determinants, symptoms and effects. In addition to research conducted under statutory research programmes and as the Faculty's own programmes, the Faculty staff takes part in research projects within European Union Programmes mostly in cooperation with governmental organizations and industrial enterprises. The Faculty has a Development Projects Office whose main task is to administer the development projects realized by the Faculty and assistance in acquiring new projects. Faculty staff members are members of various scientific and technical organizations and associations.

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Course code	Course name	ECTS credits
AL010	Basic in Jurisprudence	6
AL012	Administrative science	5
AL013	Constitutional Law	6
AL013/IT	Diritto Costituzionale (Constitutional Law)	6
AL014	Administrative Law I	4
AL015	Administration Law II	6
AL020	Fundamentals of Labour Law and Rights of Officials	4
AL027	Statistics with Demography	4
AL034	Commercial Law	5
AL034/IT	Diritto commerciale (Commercial Law)	5
AL041	Accounting and Finance of Companies	4
AL042	Project Management	4
AL047/DE	Teamkommunikation	4
DAL005	International Law	4
DAL030	System of local government	4
DAL032	System of human rights protection	4
DAL048	Law and non-governmental organizations	4
DAL050	Diplomatic Protocol in Public Administration	4
DAL053	European Law	4
DAL053/IT	Diritto europeo	4
DAL055	Society and culture of Europe	4
DEKL006/R	Kultura języka - Gumanitarnyj przedmiot I	4
DEKL007/R	Nacyonalnyje mieśszynstwa w Europie - Gumanitarnyj przedmiot II	4
DEKM024	Leadership and the art of creative thinking	4
DEKM050	Regional and international marketing	4
DMSGL006/R	Основания личного развития	4
DZL001	Production and Services Management	7
DZL002	Stress Management	4
DZL029	Sustainable Regional Development-monographic lecture I	4
DZM001	Diversity management	5
DZM004	Ethics in management	4
DZM027	Psychology of management	4
DZM057	Optimization in logistics	4
EKL008	Microeconomics	6
EKL011	Mathematics	6
EKL022	Economic Analysis	5
EKL026	Introduction to e-business	6
EKL027	Handel und Auslandsinvestitionen	6
EKL034	Managerial Accounting	6
EKL040	Techniques of negotiations and Mediations in Business	5
EKL042	Methodology of Market Research	5
EKM002	Macroeconomics	6
EKM002/DE	Makroökonomie	6
EKM003	Statistical Inference	7
EKM004	Econometric modelling and forecasting	7

EKM016	Concepts of Management	7
EKM017	Controlling in the Management	6
EKM017/R	Kontrollering v upravlenu	5
EKM018	Company pricing and value shaping	5
EKM020	Quality Policy	5
EKM021	Managing of image and brand	5
EKM030	Social Economics	7
EKM032	Social research methods	5
EKM043	Programming of local and regional development policy	6
EKM044	Strategic Management	7
MASGL038	Conflicts resolution	6
MSGL035	Communication in team leading	6
MSGL035/R	коммуникация в управлении группой	6
MSGL040	Organizational Behavior	6
MSGL043	Organizational Culture	4
ZL008	Fundamentals of Management	8
ZL009	Science of Organization	7
ZL014	Mathematics in Economics and Management	7
ZL015	Descriptive Statistics	6
ZL018	Human Resources Management	6
ZL018/DE	Personalwirtschaft	6
ZL019	Quality Management	6
ZL020	Information technology in management	4
ZL021	Basics of Marketing	6
ZL022	Marketing Research	8
ZL023	Financial Accounting	6
ZL024	Corporate Finance	7
ZL024/R	Finansy przedsiębiorstwa	7
ZL034	Decision making processes in management.	5
ZL035	Innovation in Business	5
ZL037	Marketing in trade and services	5
ZL039	PR techniques, autopresentation, public speaking	5
ZL040	Ergonomics	5
ZM007	Process Management	4
ZM008	Marketing in Business	4
ZM035	Psychology of motivation	5
ZM049	Corporate Social Responsibility	5

Course name: Building Materials	
Course code: B001	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Jurowski Krystian, Mordak Arkadiusz, a.mordak@po.opole.pl	
Prerequisites: English (min B1 level), Chemistry, Physics.	
Objectives of the course and learning outcomes: Basic knowledge about building materials in an aspect of civil engineering	
Teaching program: The basic technical properties of building materials. Natural stone materials and their application in the building industry. Mineral pneumatic binding materials: lime, gypsum. Hydraulic binding materials: cement. Building ceramic wares. Architectural glass. Metals applied in the building engineering. Special materials used for thermal and acoustic insulation. Binding agents and bituminous materials. Plastics and plastic products used in building engineering.	
Assessment methods: written/test paper examination, individual/group project paper report and/or presentation	
Recommended reading: Allen, Iano: Fundamentals of Building Construction – Materials and Methods, J. Wiley	

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Course name: Concrete Bridges	
Course code: B002	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Stankiewicz Beata, b.stankiewicz@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge about concrete structures, structural mechanics, strenght of materials.	
Objectives of the course and learning outcomes: Basic knowledge about architecture and dimensioning of concrete bridges	
Teaching program: Historical outline. The classification of concrete bridges. Materials used for building of the bridges. Principles of dimensioning of concrete bridges. Typical cross-sections of concrete bridges. Elements of fittings for the bridges. Reinforced concrete slab and slab-rib bridges. Bearings of the bridges. Frame, arch and suspension bridges. Prestressed concrete bridges. Foundations of the bridges. Modernisation and strengthening of the bridges.	
Assessment methods: written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Lecture notes	

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Course name: Concrete Structures	
Course code: B003	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Pilarska Dominika, d.pilarska@po.opole.pl	
Prerequisites: English (min B1 level), Strength of Materials, Structural Mechanics, Soil Mechanics and Foundation Engineering.	
Objectives of the course and learning outcomes: Basic knowledge about dimensioning of reinforced concrete structures	
Teaching program: The principles of design. The properties of concrete and reinforcing steel, Methods and structural design. Dimensioning of the cross-section of a reinforced concrete beam for bending and shear. Limit states (ultimate and serviceability) of reinforced concrete structures.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Nawy E.G.: Reinforced Concrete, 5th ed. Prentice Hall, 2003; Macgregor J.G.: Reinforced Concrete: Mechanics and Design, Prentice Hall, 1997; Lecture notes	

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Course name: Computer science in Engineering	
Course available with minimum number of 4 participants.	
Course code: B004	Form of class: Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Bobra Piotr, Bońkowski Piotr, Kuś Juliusz, j.kus@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge in structural mechanics and strenght of materials.	
Objectives of the course and learning outcomes: Basic knowledge about application of computer programming in engineering.	
Teaching program: Basic concepts of computer science. Formal languages. Algorithms. Forms of recording algorithms. Block diagrams. The prototype of a high-level programming language with structural characteristics. Data structures. Examples of algorithms. Selected numerical algorithms. The structure and general principles of the operation of computers. Basic software and useware. Coding, data storage and access in computer systems. Examples of a one-access operating system (personal computer) and instruction interpreter. Basic functions of a text editor Computer networks. Elements of the Internet. The fundamentals of programming in a high-level language. Compilation of modules and integration tasks. The accuracy of number representation and the accuracy of numerical calculations. Programming of the selected examples of numerical methods and engineering computations with use of a graphical library.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Numerical Recipes in Fortran 77, book on-line: http://www.library.cornell.edu/nr/cbookfpdf.html ; Larry R. Nyhoff, Sanford Leestma: Introduction to Fortran 90 for Engineers and Scientists, Prentice Hall, 1996, ISBN: 0135052157; Lecture notes.	

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Course name: Foundation Engineering	
Course code: B005	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Fedczuk Paweł, p.fedczuk@po.opole.pl	
Prerequisites: English (min B1 level), Physics, Mathematics, Geology, Strength of Materials, Engineering Mechanics, Structural Mechanics.	
Objectives of the course and learning outcomes: Basic knowledge about dimensioning of typical foundations.	
Teaching program: The classification of foundations. Design of foundations. Spot footings (kinds and calculations of the load capacity of homogenous and stratified foundation bed, stability and calculations of settlement, dimensioning). Continuous footings (kinds and calculations of the load capacity of homogenous and stratified foundation bed, stability and calculations of settlement, dimensioning). Grillage foundations. Foundation plates. Foundation boxes. Strengthening of the foundation bed. Drainage of the foundation bed and excavations.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Braja M.: Principals of Foundation Engineering, Brooks/Cole, Thomson 2004; Atkinson J.H.: The Mechanics of Soils and Foundations, McGraw Hill, Comp. London, New York 1993; Lecture notes.	

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Course name: Principles of Town Planning and Architecture	
Course code: B006	Form of class: Lecture, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Szczegielniak Anna, a.szczegielniak@po.opole.pl	
Prerequisites: English (min B1 level), Principles of arts, descriptive engineering.	
Objectives of the course and learning outcomes: Basic knowledge about architecture and town planning in an aspect of civil engineering	
Teaching program: Concepts and definitions. Contemporary comprehension of architecture objectives taking into account a historical point of view. The origin of contemporary architecture, ancient Greece and Rome. Renaissance style, Baroque style, Eclecticism, Secession. The origin of contemporary architecture with regard to structure, Early Christian period style, Gothic style, Romanticism. The outline of history of architecture seen through the structural context. Fields of contemporary architectural design. Building development sets – public sets, dwellings, industry with regard to the land development plan. Contemporary directions in architecture, the school of the international style, late modernism and postmodernism. Structures of unique buildings, large span roofs, geometry, high rise buildings.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Pevsner, Fleming, Honour: The Penguin Dictionary of Architecture, Middlesex, 1980; Thoesen Ch.: Architectural theory from the Renaissance to the present, Koln 2003; Vittorio Magnano Lampugnani, Architecture and City Planning in the Twentieth Century, New York 1984; Lecture notes	

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Course name: Introduction to Seismic Engineering	
Course code: B007	Form of class: Lecture, Project,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Bońkowski Piotr, Kuś Juliusz, j.kus@po.opole.pl	
Prerequisites: English (min B1 level), Knowledge in structural mechanics, dynamic of structures.	
Objectives of the course and learning outcomes: Acquiring basic knowledge of seismic effects and their modeling when acting on civil engineering structures.	
Teaching program: Introductory information about earthquakes and other seismic effects (rockbursts, traffic vibrations etc). Repetition of basic information about structural dynamics. Response spectrum method for single degree of freedom structures. Introductory information on seismic codes. Response spectrum method for multi degree of freedom structures. Information on seismic codes with particular attention on Eurocode 8.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Clough, Penzien „Dynamics of Structures” A.K.Chopra „Dynamics of Structures”	

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Course name: Soil Mechanics	
Course code: B008	Form of class: Lecture, Laboratory, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Fedczuk Paweł, p.fedczuk@po.opole.pl	
Prerequisites: English (min B1 level), Physics, Mathematics, Geology, Strength of Materials, Engineering Mechanics.	
Objectives of the course and learning outcomes: Basic knowledge about soil properties in an aspect of civil engineering	
Teaching program: The three-phase structure of soils. The origin of soils. The classification of soils. The physical properties of soils. Ground water. The mechanical properties of soils. Stresses in the foundation bed. Ground settlement. The load capacity of the foundation bed.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Atkinson J.H., Bransby P.L.: The Mechanics of Soils, McGraw Hill, London, 1978; Atkinson J.H.: The Mechanics of Soils and Foundations, McGraw Hill, Comp. London, New York 1993; Lecture notes	

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Course name: Strength of Materials	
Course code: B009	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Czabak Mariusz,	
Prerequisites: English (min B1 level), Engineering Mechanics, Mathematics, Linear Algebra.	
Objectives of the course and learning outcomes: Basic knowledge about methods and concepts of strength of materials used in dimensioning of engineering structures	
Teaching program: Determination of the internal forces in the complex rod systems. Fundamentals of solid body mechanics. Description of stress and strain state in a deformable solid. Physical equations of the linear elasticity. The simple cases of strength of materials: pure compression and tension, pure shear, bending and torsion. Basic calculations of displacements of rod structures.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Hibbeler R.C.: Mechanics of Materials, 4th ed., Prentice-Hall, New Jersey, 2000; Lecture notes	

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Course name: Structural Mechanics I	
Course code: B010	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Bońkowski Piotr, Kokot Seweryn, s.kokot@po.opole.pl	
Prerequisites: English (min B1 level), Engineering Mechanics, Mathematics, Linear Algebra.	
Objectives of the course and learning outcomes: Basic knowledge about methods and concepts of structural mechanics used in calculations of internal forces for engineering structures	
Teaching program: Analysis of statically determinate structures: beams, three-hinged arches and frames, trusses, space framework and influence lines for them. Envelopes of internal forces for moveable and variable loads. The kinematic analysis of structures. The virtual work principle under the virtual states of displacement and loads. The analysis of statically indeterminate structures by the method of forces: continuous beams and their influence lines, plane frames, arches, trusses, grids.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Meriam J.L. Kraige L.G.: Engineering mechanics-statistics, J. Wiley	

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Course name: Steel Bridges	
Course available with minimum number of 4 participants.	
Course code: B011	Form of class: Lecture, Group tutorial,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Jakiel Przemysław, p.jakiel@po.opole.pl	
Prerequisites: English (min B1 level), Steel Structures, Strength of Materials, Structural Mechanics, Basis about Bridge Structures.	
Objectives of the course and learning outcomes: Basic knowledge about rational dimensioning and designing of modern steel bridge structures.	
Teaching program: Basic knowledge about materials and structures concerning steel bridges. The principles of design road and railway steel bridges: steel bridge decks, cross-sections, plate, box and composite girders, portal, truss and arch girders, bracings, layout of steel suspension and cable-stayed bridges, bearings, pretension of steel bridges. Methods and structural design. Limit states design (ultimate and serviceability) of steel bridge structures.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: a.Chatte Sukhen, The Design of Modern Steel Bridges Book. Wiley Blackwell, 2003. b.Ghosh Utpal K., New Design and Construction of Steel Bridges. Taylor	

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Course name: Environment Protection in Transportation Engineering	
Course code: B012	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Beben Damian, d.beben@po.opole.pl	
Prerequisites: English (min B1 level), Mathematics, Physics.	
Objectives of the course and learning outcomes: Basic knowledge about environment protection in transportation engineering	
Teaching program: European program of the environmental protection (The Ecological Network Nature 2000). Noise caused by the transportation engineering. Air pollution nearby roads. Crossings for animals as the effective protection method of wild fauna. Ground and water pollutions during service of the transportation routes. Environmental monitoring in the transportation investments.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Salvato J.A., Nemerow N.L., Agardy F.J.: Environmental Engineering (5th Edition), John Wiley	

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Course name: Road Communication Engineering	
Course code: B013	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kozłowski Wojciech, w.kozlowski@po.opole.pl	
Prerequisites: English (min B1 level), Mathematics, Physics.	
Objectives of the course and learning outcomes: Basic knowledge about architecture and dimensioning of communication buildings.	
Teaching program: Polish technical guidelines projections of motor roads. The geometrical formation of motor roads (the road in the plan, in the profile, in the cross-section). Road - earthworks - the projection and the technology of the execution. The projection of road surfaces - methods and Polish catalogues. The projection of cross-roads (Polish directions). Basic engineering of the road traffic (measurement and the analysis of the traffic, the modeling, the capacity of roads, streets and crossings). Basic knowledge about bridges (types, kinds, the classification and the characterization of bridge objects). Bridge constructions - the projection and the execution	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Lecture notes	

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Course name: Transport Engineering I	
Course code: B014	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Stankiewicz Beata, b.stankiewicz@po.opole.pl	
Prerequisites: English (min B1 level), Mathematics, Physics.	
Objectives of the course and learning outcomes: Basic knowledge about dimensioning of road and bridge structures.	
Teaching program: The basic technical properties of building materials using for road and bridge structures. The classification of roads. Typical bridge structures. Principles of dimensioning of road structures. Basic rules in highway engineering.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Lecture notes, presentations.	

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Course name: Engineering Surveying	
Course code: B015	Form of class: Lecture,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Anigacz Wojciech, w.anigacz@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Basic knowledge about engineering surveying in civil engineering	
Teaching program: Levelling. Total stations. Surveying instruments. Electronic and Electro-optical distance measurement. GPS. Examination of the plumb-line and edge of a building. Control checks of hydrotechnical structures on the example of a weir. Inventory surveys of cranes and crane tracks.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Uren J., Price W.F.: Surveying for engineers. Fourth edition. Palgrave Macmillan. 2006 Bannister A., Raymond S.: Surveying. Frouth edition. Pitman 1977.	

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Course name: Fundamentals of Structural Dynamics	
Course code: B016	Form of class: Lecture, Project,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Bońkowski Piotr, Kokot Seweryn, s.kokot@po.opole.pl	
Prerequisites: English (min B1 level), Structural mechanics, strenght of materials.	
Objectives of the course and learning outcomes: The student who successfully completes the course will be able to demonstrate a good knowledge of the dynamic behaviour of structures and the related methods of modelling and analysis, with particular emphasis on Civil Engineering applications and linearly elastic analysis. The student will be able to carry out the dynamic analysis of structures modelled as discrete mechanical systems by using both analytical and numerical methods. Furthermore, the student will be able to formulate and solve problems involving simple continuous structures, such as wires, rods, and beams. Lastly, the student will demonstrate awareness of the assumptions made in the definition of the mechanical models and the fields of applicability of the learned techniques.	
Teaching program: Introduction to Structural Dynamics: classification of loads, mechanical systems, and types of analysis. Structures modelled as single-degree-of-freedom mechanical systems: equation of motion, free vibrations, response to dynamic loads, analytical and numerical solution methods. Structures modelled as multi-degree-of-freedom mechanical systems: modal analysis, mode superposition method, energy methods, finite element discretisation. Continuous systems: free vibrations and response to dynamic loads of wires, rods, and beams.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: R.W. Clough	

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Course name: Programming of Numerical Methods in MATLAB	
Course available with minimum number of 4 participants.	
Course code: B017	Form of class: Project,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Bońkowski Piotr, Kokot Seweryn, s.kokot@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge about structural mechanics and strenght of materials.	
Objectives of the course and learning outcomes: Students are able to: - propose algorithms of simple tasks, - use basic elements of the program (variables, mathematical operations, conditions, loops, etc.), - use an iterative and recursive procedures, - designed algorithms written in the programming language Matlab - create scripts and functions, - work with the basic data formats, - create a search function and basic methods of sorting by known algorithms, - use the features most used libraries, - create own toolboxes of functions, - own programs to describe and explain.	
Teaching program: The course is designed as an introduction to the problems of algorithms and programming. Students are introduced to the basic concepts of programming, development of algorithms and programs. The emphasis is on the design and implementation of programs. The knowledge of the basic elements of the program is required and students should be able to use these elements. Students are familiar with the programming environment Matlab, where students programmed scripts and functions solving simple problems.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Wirth N: Alorithms Data Structures=Program, Prentice Hall, 1976 (EN)	

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Course name: Hydraulics and hydrology	
Course code: B018	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kozłowski Wojciech, w.kozlowski@po.opole.pl	
Prerequisites: English (min B1 level), Mathematics, Physics.	
Objectives of the course and learning outcomes: Basic knowledge about hydraulics and hydrology in an aspect of civil engineering	
Teaching program: Hydrostatic pressure. Hydrostatic pressure on the flat and curved surfaces. Buoyancy. Equilibrium of bodies submerged. The conditions of equilibrium of floating bodies. The movement of liquid. The viscosity of the liquid. Bernoulli's equation for a fluid stream of perfect and real. Bleed and hydraulic drop. Laminar and turbulent motion. Flow under pressure. Resistance movement. Pipelines, siphon and traps. Movement in open troughs. Energy self (internal). Hydraulic jump, its form and length. Damming. Transfers of a sharp edge (thin wall) - non sunk and sunk. Transfers of practical shapes. Spillways (without vacuum). Transfers with a wide crown. Calculating the width of the transfer (light weir). Calculation of the accumulation of money transfer. Light bridges and culverts. Calculation of light bridges. Calculation of the culverts. The movement of groundwater. Ditches and wells. Drainage trenches. Types of drainage. Drainage. Needle-filters. Manholes. Filtration in the construction industry. Filtration of the buildings. Filtration through embankments, dikes and the dam. Hydrometric measurements. Measurement of water status. Measurement of depth. Measurement of flow velocity. Measurement of flow rate. Measurement of sediment transport. Stocks and flows in rivers. Water states. Characteristic states. Flow curve. Flow characteristics. Water balance.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Gribbin John E.: Introduction To Hydraulics	

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Course name: Design Work-Individual Project	
Course code: B019	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kozłowski Wojciech, w.kozlowski@po.opole.pl	
Prerequisites: English (min B1 level), Mathematics, Physics.	
Objectives of the course and learning outcomes: Knowledge about hydraulics and hydrology in an aspect of civil engineering	
Teaching program: Individual project of dam.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Gribbin John E.: Introduction To Hydraulics	

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Course name: Fluid Mechanics	
Course code: B020	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kozłowski Wojciech, w.kozlowski@po.opole.pl	
Prerequisites: English (min B1 level), Mathematics, Physics.	
Objectives of the course and learning outcomes: Basic knowledge about fluid mechanics in an aspect of civil engineering	
Teaching program: Hydrostatic pressure. Hydrostatic pressure on the flat and curved surfaces. Buoyancy. Equilibrium of bodies submerged. The conditions of equilibrium of floating bodies. The movement of liquid. The viscosity of the liquid. Bernoulli's equation for a fluid stream of perfect and real. Bleed and hydraulic drop. Laminar and turbulent motion. Flow under pressure. Resistance movement. Pipelines, siphon and traps. Movement in open troughs. Energy self (internal). Hydraulic jump, its form and length. Damming. Transfers of a sharp edge (thin wall) - non sunk and sunk. Transfers of practical shapes. Spillways (without vacuum). Transfers with a wide crown. Calculating the width of the transfer (light weir). Calculation of the accumulation of money transfer. Light bridges and culverts. Calculation of light bridges. Calculation of the culverts. The movement of groundwater. Ditches and wells. Drainage trenches. Types of drainage. Drainage. Needle-filters.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Gribbin John E.: Introduction To Hydraulics	

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Course name: Steel Structures	
Course code: B021	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kuś Juliusz, j.kus@po.opole.pl	
Prerequisites: English (min B1 level), Strength of materials, structural mechanics.	
Objectives of the course and learning outcomes: Understands the importance of right design of metal structures .	
Teaching program: Steel properties. Metallurgic products. Ultimate limit states and serviceability limit states of steel structures. Design of uniform simple steel columns, beams and beams systems.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Karuna Moy Ghosh - Practical Design of Steel Structures - Based on Eurocode 3 (with case studies):A multibay melting shop and finishing mill building. AISC - Specification for structural steel buildings. NS Trahair (et. al.) - The behaviour and design of steel structures to ec3 (4th edition)	

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Course name: Engineering Structures	
Course code: B022	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kuś Juliusz, j.kus@po.opole.pl	
Prerequisites: English (min B1 level), Strength of materials, structural mechanics.	
Objectives of the course and learning outcomes: Knowledge on basic loads acting on structures. Basic knowledge on dimensioning of reinforced concrete structures in industrial plants.	
Teaching program: Rules of organization, design, supervision and standardization in industrial structures. Characteristics of external demands occurring in the design of industrial structures. Characteristics of unification and structural solutions in industrial structures. Characteristics of the load diversity in industrial structures. Characteristics of the structure and design principles of high brick and reinforced concrete chimneys.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Arthur Nilson, David Darwin, Charles Dolan - Design of Concrete Structures - McGraw-Hill. Wai-Fah Chen - The Civil Engineering Handbook (New Directions in Civil Engineering). Chris J. Brown - Silos: Fundamentals Of Theory, Behaviour, And Design.	

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Course name: Structural Mechanics II	
Course code: B023	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kokot Seweryn, s.kokot@po.opole.pl	
Prerequisites: English (min B1 level), Structural Mechanics I, Mathematics, Linear Algebra.	
Objectives of the course and learning outcomes: Advanced knowledge about methods and concepts of structural mechanics used in calculations of internal forces for engineering structures	
Teaching program: Analysis of statically determinate structures: beams, three-hinged arches and frames, trusses, space framework and influence lines for them. Envelopes of internal forces for moveable and variable loads. The kinematic analysis of structures. The virtual work principle under the virtual states of displacement and loads. The analysis of statically indeterminate structures by the method of forces: continuous beams and their influence lines, plane frames, arches, trusses, grids.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Meriam J.L. Kraige L.G.: Engineering mechanics-statistics, J. Wiley	

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Course name: Individual Project Design	
Course code: B024	Form of class: Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kuś Juliusz, j.kus@po.opole.pl	
Prerequisites: English (min B1 level), Knowledge on basic loads acting on structures. Basic knowledge on dimensioning of reinforced concrete structures and steel structures. Basic knowledge on statics of structures and strength of materials.	
Objectives of the course and learning outcomes: Principles of design, normalization and loads in industrial structures. Computational schemes, load bearing capacity, cracking and strains of industrial chimneys and trusses.	
Teaching program: 1) Draft of high brick or reinforced concrete chimney: calculations and construction drawings. 2) Draft of steel truss: calculations and construction drawings.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: ---	

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Course name: Architectural Design II - Single family housing design	
Course code: B025	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 7	Start date: October, February
Number of hours per week: 3	Number of hours per semester: 45
Language of instruction: English	
Name of the lecturer and contact information: Szczegielniak Anna, a.szczegielniak@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge about computer aided technical drawing.	
Objectives of the course and learning outcomes: The aim of the course is to acquaint the student with the forms zbudowy freestanding single-family housing and compact. Students gain the ability to design various forms of single-family housing.	
Teaching program: The theme of the project is a single family house detached, carried out in the form of sketchy in the first half of the semester. The second half is devoted to designing the buildings serial (or other form of building compact) on the basis of the concept of small urban settlements done in teams of 2-3. The work is done in the classroom and during individual work outside the university. Taking carry out a critical analysis presented by the participants of solutions of individual adjustment mode, but conducted in the presence of students of the group.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Pevsner, Fleming, Honour: The Penguin Dictionary of Architecture, Middlesex, 1980; Thoesen Ch.: Architectural theory from the Renaissance to the present, Koln 2003; Vittorio Magnano Lampugnani, Architecture and City Planning in the Twentieth Century, New York 1984; Lecture notes	

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Course name: Computer Methods in Structural Mechanics	
Course available with minimum number of 4 participants.	
Course code: B026	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Bobra Piotr, Bońkowski Piotr, Kuś Juliusz, j.kus@po.opole.pl	
Prerequisites: English (min B1 level), Structural mechanics, strength of materials	
Objectives of the course and learning outcomes: The aim of the course is to learn methods used in the engineering calculations (Finite Element Method), including their algorithms and limitations and acquisition of actual skills of modeling of engineering problems and solving them with software based on these methods.	
Teaching program: Application of Finite Element Method in the calculation of rectangular plates. Application of Finite Element Method in calculations of 2D framework structures. Calculations of the 2D framework with use of two computer programs (ARSA/RMWIN) and comparing the results.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: An Introduction to the Finite Element Method (Mcgraw Hill Series in Mechanical Engineering); The Finite Element Method: Linear Static and Dynamic Finite Element Analysis (Dover Civil and Mechanical Engineering)	

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Course name: Theory of Elasticity and Plasticity	
Course code: B027	Form of class: Lecture, Group tutorial,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 4	Number of hours per semester: 60
Language of instruction: English	
Name of the lecturer and contact information: Kozłowski Wojciech, w.kozlowski@po.opole.pl	
Prerequisites: English (min B1 level), Mathematics, Physics, Structural mechanics, strenght of materials.	
Objectives of the course and learning outcomes: At the end of the semester, students will be able to: Assess and analyze plastic limit states, understand the elastic and elastic-perfectly plastic behavior of two dimensional plane stress systems and behavior under bending, use the boundary problem for solving two-dimensional plan stress scenarios and plates under bending.	
Teaching program: Scope of theory of elasticity, tensor algebra, Cartesian tensors, tensor calculus, differential operators, integral operators and theorems. Solutions in Cartesian and Polar coordinates for plane stress, plane stress and plane strain. Kinematics of continuum, deformation tensors and strain tensors, Airy Function for plane stress. Cauchy stress tensor. Elasticity theory balance principles, constitutive laws, theory of elasticity equations, linearly elastic materials, engineering constants, Hook´s law, hyperelastic materials. Formulation of the boundary problem, thin elastic plates, analysis of plate boundary conditions, kinematic principles, analysis of different shapes of plate.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: D.e.r. Godfrey, Theoretical Elasticity and Plasticity for Engineers. Thames	

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Course name: Transport Engineering II	
Course code: B028	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Stankiewicz Beata, b.stankiewicz@po.opole.pl	
Prerequisites: English (min B1 level), Transport Engineering I, Concrete Structures, Steel Structures.	
Objectives of the course and learning outcomes: Roads, highways, railways, tunnels, European transport system, bridge structures.	
Teaching program: The planning aspects of transport engineering relate to urban planning. The planning, design, construction, and operation of highways, roads and railways. The highways systems in many countries in Europe. The types of highway interchanges and elements of design. The conception of bridge structure - concrete, steel or composite like element of interchange. The fast train and possibilities of development of high speed railways in Europe. Tunnel buildings using in transport connections. Noise protection near highway by noise barriers.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Flexibility in Highway Design, U.S. Department of Transportation Federal Highway Administration, 1997 Interchanges, WSDOT Design Manual M 22-01.08, July 2011 Chapter1360 Own lecturer's materials.	

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Course name: Shell and thinwalled Structures	
Course code: B029	Form of class: Project, Seminar,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Kuś Juliusz, j.kus@po.opole.pl	
Prerequisites: English (min B1 level), Mathematics: linear algebra, matrix notation, functions of one and more variables, calculus, ordinary and partial differential equations. Others: basic theory of elasticity, dynamics, theory and practical knowledge of the FEM, including nonlinear problems solution.	
Objectives of the course and learning outcomes: Students will be able to classify correctly individual practical problems in the context of theory of thin-walled bodies. They will discern relevant and irrelevant input parameters from the point of view of structural response and possible failure modes such as large displacements, structural instability or load-bearing capacity. They will be able to select an effective solution algorithm for each problem.	
Teaching program: This course deals with these specifics in detail for individual types of thin-walled structures: membranes, plates, membrane and bending theory of shells and thin-walled beams. Basic equations describing the above problems are formulated, the possibility of their analytical solution is discussed and numerical solution by the FEM. Attention is also paid to the stability and vibration of thin-walled structures.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: J.F.Doyle: Nonlinear Analysis of Thin-Walled Structures, Springer, 2001. S.Timoshenko, J.M.Gere: Theory of Elastic Stability, McGraw-Hill, 1963. Z.Waszczyzyn et al.: Stability of Structures by Finite Element Method, Elsevier, 1994.	

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Course name: Architectural Design VII	
Course code: B031	Form of class: Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 7	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Szczegielniak Anna, a.szczegielniak@po.opole.pl	
Prerequisites: English (min B1 level), Student has basic knowledge about architectural design, the master plans, knows basic types of public buildings and its architecture. - Student can draw more complicated architectural projects - Student can present the project	
Objectives of the course and learning outcomes: Student can design a project of complex public building like gallery, museum, theater, can draw a complex architectural project.	
Teaching program: - analysing the existing buildings of similar types - analysing the given plot - making conclusions on the material given and studied - working on a project with assist and corrections of a teacher	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Pevsner, Fleming, Honour: The Penguin Dictionary of Architecture, Middlesex, 1980; Thoesen Ch.: Architectural theory from the Renaissance to the present, Koln 2003; Vittorio Magnano Lampugnani, Architecture and City Planning in the Twentieth Century, New York 1984; Lecture notes	

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Course name: Security, hygienics and first aid in the building enterprise	
Course code: B032	Form of class: Lecture, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kozłowski Wojciech, w.kozlowski@po.opole.pl	
Prerequisites: English (min B1 level), Structural mechanics, strength of materials	
Objectives of the course and learning outcomes: Basic knowledge about Occupational Safety	
Teaching program: The working conditions at the construction site. Workers social facilities at a construction site. Principles of work organization at a construction site. Scaffolding and traffic safety on scaffolding. The organization of working at heights. Rules for the use of mechanized equipment for construction site. Security installation work. Safety in deep excavation. Procedure in case of building disasters. Principles of safe demolition. Accidents at work in the construction and occupational diseases. Systems for assessing the victim, rescuer and stress. Proceedings in the case of mechanical injuries. Proceedings in the case of injuries caused by environmental threats. Principles of resuscitation in cases of loss of vital signs.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: a) Reese Ch. D.: Occupational Health and Safety Management: A practical Approach. CRC, Press, 2008. b) BLS. Survey of occupational injuries and illnesses. Washington, D.C.: U.S. Department of Labor, Bureau of Labor Statistics, Safety and Health Statistics Program. 2002. Nonfatal (OSHA recordable) injuries and illnesses. Industry incidence rates and counts c) "HSE - Construction Industry Statistics". Health and Safety Executive. Retrieved 2015-04-17. d) Swanson, Naomi; Tisdale-Pardi, Julie; MacDonald, Leslie; Tiesman, Hope M. (13 May 2013). "Women's Health at Work". National Institute for Occupational Safety and Health. Retrieved 21 January 2015.	

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Course name: Final Thessis	
Course code: B033	Form of class: Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 20	Start date: October, February
Number of hours per week: 3	Number of hours per semester: 45
Language of instruction: English	
Name of the lecturer and contact information: Bęben Damian, d.beben@po.opole.pl Kuś Juliusz, j.kus@po.opole.pl	
Prerequisites: English (min B1 level), Strenght of materials, structural mechanics, concrete and steel structures.	
Objectives of the course and learning outcomes: Final thesis theme is linked to knowledge of the some chosen elements of Civil Engineering.	
Teaching program: Teaching program - main areas of the final thesis: - design of steel warehouse, - design of concrete silo or chimney, - design of building for seismic loads,	
Assessment methods: Individual elaboration.	
Recommended reading: According to the area of realized final project.	

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Course name: Revitalisation of post industrial areas	
Course code: B034	Form of class: Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 8	Start date: October, February
Number of hours per week: 3	Number of hours per semester: 45
Language of instruction: English	
Name of the lecturer and contact information: Gałkowski Marcin, m.galkowski@po.opole.pl Szczegielniak Anna, a.szczegielniak@po.opole.pl	
Prerequisites: English (min B1 level), - Student has basic knowledge about history of architecture - Student has basic knowledge about the sociological and economical changes - Student can design basic architectural projects - Student can present the project	
Objectives of the course and learning outcomes: After the course student: - knows the history of industrialisation and problems of revitalising postindustrial areas - can analyse the historical and/or postindustrial building - can design a project of revitalising a postindustrial building - understands the effect industry has on a landscape	
Teaching program: - analysing the existing buildings of similar types - analysing the given plot - making conclusions on the material given and studied - working on a project with assist and corrections of a teacher	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Pevsner, Fleming, Honour: The Penguin Dictionary of Architecture, Middlesex, 1980; Thoesen Ch.: Architectural theory from the Renaissance to the present, Koln 2003; Vittorio Magnano Lampugnani, Architecture and City Planning in the Twentieth Century, New York 1984; Lecture notes	

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Course name: Traffic Engineering	
Course code: B035	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kozłowski Wojciech, w.kozlowski@po.opole.pl	
Prerequisites: English (min B1 level), Mathematics, Physics, Communication Building	
Objectives of the course and learning outcomes: Basic knowledge about traffic engineering	
Teaching program: Characteristics of road users. Characteristics vehicles. Vehicle maneuvers. The speed of vehicles. Measuring, testing and traffic analysis. A comprehensive study of the movement. Modelling of traffic. Throughput of roads and streets on the sections between intersections, the concept of bandwidth and traffic conditions, the characteristics of the HCM method. Bandwidth and traffic conditions bidirectional. Bandwidth and traffic conditions on the roads and highways multi-groove. Intersections with priority bandwidth of the vehicle. Throughput of small and medium-sized roundabouts. Throughput intersections with traffic lights. Transport policy and traffic management. The marking of roads and streets. Traffic lights at the intersection. Traffic control systems on urban roads and highways. Priorities in traffic for public transport. Parking. Pedestrian traffic. Cycling.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: a) Pline James L.: Traffic Engineering Handbook, Institute of Transportation Engineers, 5th ed., 2006; b) Zarrillo, M. "Traffic Engineering Handbook, 5th ed ., USA 2001. c) Road Safety Fundamentals. Ithaca, NY: Cornell Local Roads Program. September 2009. d) Homburger, Kell and Perkins, Fundamentals of Traffic Engineering, 13th Edition, Institute of Transportation Studies, University of California (Berkeley), 1992. e) Das, Shantanu and Levinson, D. :A Queuing and Statistical Analysis of Freeway Bottleneck Formation. ASCE Journal of Transportation Engineering Vol. 130, No. 6, November/December 2004, pp. 787-795	

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Course name: Underground engineering	
Course code: B036	Form of class: Lecture,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kozłowski Wojciech, w.kozlowski@po.opole.pl	
Prerequisites: English (min B1 level), Mathematics, Physics, Communication Buildings	
Objectives of the course and learning outcomes: Basic knowledge about underground engineering	
Teaching program: Basic laws of soil mechanics. Geotechnical investigation and design. Choice of tunnels vs. bridges. Cost estimates and overruns. Cut-and-cover. Boring machines. Shafts. Sprayed concrete techniques. Pipe jacking. Box jacking. Underwater tunnels. Temporary way. Enlargement. Open building pit The procedures required for the design of new or refurbished road tunnels located within Motorways and Other Trunk Roads and railway tunnel. It gives guidance on the necessary equipment and Operational and Maintenance Systems that need to be considered by the designer to facilitate continued effective and safe operation.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: a) Kézdi, L. Rétháti Handbook Of Soil Mechanics: Application Of Soil Mechanics In Practice Examples And Case Histories, Elsevier Science b) DESIGN MANUAL FOR ROADS AND BRIDGES: VOLUME 2: SECTION 2: PART 9: BD 78/99: DESIGN OF ROAD TUNNELS. The Department for Transport. 1999. c) NFPA Standard for Safeguarding Construction, Alteration, and Demolition Operations. National Fire Protection Association. d) "Tunnelling". tunnellersmemorial.com. Retrieved 2010-06-20. e) Bickel. Tunnel engineering handbook, 2nd edition. CBS Publishers, 1995 f) Powers, P.J. Construction de-watering and groundwater control. Hoboken, NJ: John Wiley	

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Course name: Urban Communications	
Course code: B037	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kozłowski Wojciech, w.kozlowski@po.opole.pl	
Prerequisites: English (min B1 level), Mathematics, Physics, Communication Building.	
Objectives of the course and learning outcomes: Basic knowledge about urban communications.	
Teaching program: Urban transport systems in the world. Characteristics of transport resources (bus, tram, trolley bus, metro, suburban train, unconventional measures). Criteria for the selection of the transport agent. Characteristics of road and street infrastructure and of bus, including solutions to improve the movement of public transport vehicles. Evaluation of the effectiveness of the functional and economic transport investment.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: McKay, John P. Tramways and Trolleys: The Rise of Urban Mass Transport in Europe, 1976. Middleton, William D. 1967. The Time of the Trolley (ISBN 0-89024-013-2). Milwaukee (WI), US: Kalmbach Publishing. Trolleybus history – current collector design. Hardy J. Paris Metro Handbook London, 1999.	

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Course name: Construction and Maintenance of Roads and Bridges	
Course code: B038	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kozłowski Wojciech, w.kozlowski@po.opole.pl	
Prerequisites: English (min B1 level), Mathematics, Physics, Communication Building.	
Objectives of the course and learning outcomes: Basic knowledge about construction and maintenance of roads and bridges.	
Teaching program: Technology of road pavements. Characteristics of the site and its organization. Mechanization of roadworks. Earthworks in realizations road. Types of road substructures. Tie layers and abrasion - types, aspects of execution. The technology of concrete pavements. Selected studies of asphalt mixtures. Roadway safety, ways to reduce road noise. Types of surface damage. Pavement Condition Assessment System (SOSN). Records roads. Road maintenance works. Devices used to technical state of the surface. Methods for upgrading roads. Supports execution of road and railway bridges. Ways to perform foundations. An overview of the assembly spans the road and rail facilities depending on the terrain, hydrological and geological, transport and equipment. Climb the steps of building bridges, various assembly technologies. Acceptance tests required materials and construction. Bridges as part of the infrastructure. Maintenance management systems for bridges. Maintenance of the organization process, the legal basis. Degradation processes objects. Types and causes damage to the structure, states of emergency. Principles of evaluation of technical and usability. Planning and execution of maintenance works. Systems supporting maintenance. Inspection of bridges in the examples. Development of observations and recommendations in the cards maintenance facilities.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: a) O'Flaherty, Coleman A. Highways: The Location, Design, Construction	

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Course name: Design of airports	
Course code: B039	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Kozłowski Wojciech, w.kozlowski@po.opole.pl	
Prerequisites: English (min B1 level), Mathematics, Physics, Communication Building.	
Objectives of the course and learning outcomes: Basic knowledge about designing of airports.	
Teaching program: Conceptual design landing. The length of the airport. Characteristics airports. Ground taxiway. Above ground taxiway for aircraft traffic. Through corridors and aircraft parking space. Heliport located on the surface of the earth.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Aerodrome Design Manual. Wisna Aidis, Part -4, ICAO, Second Edition, 2003. Aerodrome Design Manual. Runways Part -1, ICAO, Second Edition, 2004. Manual on Air Traffic Forecasting. ICAO, Second Edition, 2005.	

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Course name: Design of earthen structures in communication buildings	
Course code: B040	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kozłowski Wojciech, w.kozlowski@po.opole.pl	
Prerequisites: English (min B1 level), Mathematics, Physics, Communication Building	
Objectives of the course and learning outcomes: Basic knowledge about designing of earthen structures in communication buildings.	
Teaching program: Embankment in transportation, a raised bank to carry a road, railway, or canal across a low-lying or wet area. Embankments are often constructed using material obtained from a cutting. Embankments need to be constructed using non-aerated and waterproofed, compacted (or entirely non-porous) material to provide adequate support to the formation and a long-term level surface with stability. Types of excavation. Equipment. Mass haul planning. Retaining walls. Gabions.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: a) Scott, J., Loveridge, F.,	

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Course name: Design of parkings	
Course code: B041	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kozłowski Wojciech, w.kozlowski@po.opole.pl	
Prerequisites: English (min B1 level), Mathematics, Physics, Communication Building	
Objectives of the course and learning outcomes: Basic knowledge about designing of parkings	
Teaching program: Parking and its characteristics. Types and parking lots. Parking at the curb. Dedicated parking. Parking (garages) multi-level. Underground car parks. Automatic and semi-automatic parking. Platform parking (parking subsidiaries). Underground garage exits. Semi-automatic parking systems. Automatic parking (palletless systems). Automatic parking (pallet systems). Parking surfaces. Technical requirements - legal. Multi parking surfaces. Green car park deck. Parking surfaces with single-family homes.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: a) "The Guide to Parking Lots". Discount Park	

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Course name: Road materials	
Course code: B042	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Kozłowski Wojciech, w.kozlowski@po.opole.pl	
Prerequisites: English (min B1 level), Mathematics, Physics, Communication Buildings	
Objectives of the course and learning outcomes: Basic knowledge about road materials.	
Teaching program: Asphalt. SMA. AC. Concrete road surface . Composite surfaces. Roads substructures. Recycling. In-place recycling. Bituminous surface. Thin membrane surface. Gravel surface. Other surfaces. Acoustical implications. Surface deterioration. Road markings.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: a. First American Macadam Road US Department of Transportation - Federal Highway Administration (Accessed 2008-10-10) b. Warm Mix Asphalt Technologies and Research. Federal Highway Administration. 29 October 2008. Retrieved 4 August 2010. c. Hot, Warm, Luke Warm and Cold Mix Asphalt. Cornell Local Roads Program. June 2009. Retrieved 4 August 2010. d. Concrete Pavement Restoration. Retrieved 7 April 2012. e. Road Transportation – A History and How We Use it Today". American Auto Move. 30 August 2012. Retrieved 12 September 2012.	

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Course name: Road traffic safety	
Course code: B043	Form of class: Lecture,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kozłowski Wojciech, w.kozlowski@po.opole.pl	
Prerequisites: English (min B1 level), Mathematics, Physics, Communication Buildings	
Objectives of the course and learning outcomes: Basic knowledge about road traffic safety.	
Teaching program: Road traffic safety. Road safety in Poland. Types of vehicle safety. Active safety. Passive safety. Post-accident safety. Environmental safety. Construction safety. Road safety programs. Approval provisions regarding vehicle safety. Driver. Biomechanics of injury. The collision of the vehicle with a pedestrian.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: 1. International Transport Forum, "Towards Zero, Ambitious Road Safety Targets and the Safe System Approach". OECD. Retrieved 26 January 2012. It recognises that prevention efforts notwithstanding, road users will remain fallible and crashes will occur. 2. Road Safety Management, Retrieved 08/07/2013 3. Towards Zero Framework 4. Statistical Annex, World report on road traffic injury prevention 5. "World report on road traffic injury prevention". World Health Organisation. Retrieved 14 April 2010. 6. "UN raises child accidents alarm". BBC News. 10 December 2008. Retrieved 22 May 2010. 7. Lovegrove G., Sayed T. "Macro-level collision models for evaluating neighbourhood traffic safety". Canadian Journal of Civil Engineering 33: 609–621. doi:10.1139/I06-013. 8. "Speed Cameras". ROSPA. The Cochrane Collaboration published out a second systematic review in 2006, which was updated in 2010. These studies only included before-and-after trials with comparison areas and interrupted time series studies. 9. "Reduce Injuries Associated with Motor Vehicle Crashes".Cochrane Database of Systematic Reviews (Centers for Disease Control and Prevention)	

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Course name: Theory of road surfaces dimension	
Course code: B044	Form of class: Lecture,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kozłowski Wojciech, w.kozlowski@po.opole.pl	
Prerequisites: English (min B1 level), Mathematics, Physics, Communication Buildings	
Objectives of the course and learning outcomes: Basic knowledge about theory of road surfaces dimension.	
Teaching program: Asphalt concrete road surface design. Concrete road surface design. Composite surfaces. Recycling. In-place recycling. Bituminous surface. Thin membrane surface. Gravel surface. Other surfaces. Acoustical implications. Surface deterioration. Road markings.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: a. Anon (June 1991). "Highway construction/ Ground insulation". Styropor: Technical information. Retrieved 29 January 2010. b. Jump up^ "Warm Mix Asphalt Technologies and Research". Federal Highway Administration. 29 October 2008. Retrieved 4 August 2010. c. Jump up^ "Hot, Warm, Luke Warm and Cold Mix Asphalt". Cornell Local Roads Program. June 2009. Retrieved 4 August 2010. d. "Concrete Pavement Restoration". Retrieved 7 April 2012.	

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Course name: Geology	
Course code: B045	Form of class: Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Duda Józef, jo.duda@po.opole.pl	
Prerequisites: English (min B1 level), - Student has basic knowledge about physical and chemical processes, - Student can read maps and do technical drawings	
Objectives of the course and learning outcomes: After the course student: - is able to identify basic kinds of rocks and can find optimal application for each kind; - is able to identify basic types of ground, and understands the influence of ground conditions on engineering objects stability; - knows the basic laws for groundwater migration and influence of groundwater conditions on engineering objects.	
Teaching program: - Introduction to mineralogy and petrology; - Recognition and description of ground types; - Geological maps and geological cross-section; - Geotechnical cross-section; - Hydrogeology in civil engineering; - Documentation of geological and geotechnical works.	
Assessment methods: Written/test paper examination, individual/group project paper report and/or presentation.	
Recommended reading: Blyth F.G.M., de Freitas M.H.: A Geology for Engineers. Elsevier 1984	

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Course name: Architectural Design IV	
Course code: B046	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Szczegielniak Anna, a.szczegielniak@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: ---	
Teaching program: ---	
Assessment methods: ---	
Recommended reading: ---	

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Course name: Agile management of IT projects	
Course code: E001	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 4	Number of hours per semester: 60
Language of instruction: English	
Name of the lecturer and contact information: Zatwarnicka Anna, a.zatwarnicka@po.opole.pl	
Prerequisites: English (min B1 level), Basic Knowledge of software engineering	
Objectives of the course and learning outcomes: Knowledge about software engineering methodologies and team building rules. Knowledge about differences between traditional and Agile methodologies. Knowledge about SCRUM.	
Teaching program: 1. Software engineering methodology (waterfall model, iterative model, spiral model, V-model) 2. Phases in particular models and team organization. 3. Agile manifesto. 4. Agile methodologies – Kanban, SCRUM, TDD) 5. Advantages and disadvantages of traditional and agile methods. 6. IT project realized in SCRUM methodology (web system, mobile system).	
Assessment methods: Oral or written examination and group project report.	
Recommended reading: http://agilemanifesto.org/ „The Agile Samurai” Jonathan Rasmusson (2010) “Learning Agile” Jennifer Greene, Andrew Stellman (2014) http://www.agilenutshell.com/ https://project-management.com/	

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Course name: Algorithm Design	
Course code: E002	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Paszkiel Szczepan, s.paszkiel@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge about algorithms	
Objectives of the course and learning outcomes: The graduate has a knowledge about the algorithm design. The graduate can present the algorithm in many ways.	
Teaching program: 1. Cryptography, RSA algorithm - key generation. 2. Metaheuristics: Introduction and classification. Metaheuristics based on social adaptation. 3. Basic Local Search Algorithms. Simulated cooling. 4. Concept and elements of population-based algorithms. 5. Genetic algorithms. Genetic programming. 6. Differential evolution and other algorithms of continuous optimization. 7. Hybrid metaheuristics: populations and trajectories. 8. Memetic algorithms and scattered search.	
Assessment methods: Presentation, coursework, oral test.	
Recommended reading: Cormen T.H., Leiserson C.E., Rivest R.L., Introduction to Algorithms Aho, A. V., Hopcroft, J. E., Ullman, J. D., The Design and Analysis of Computer Algorithms Sedgewick R., Algorithms in C	

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Course name: Antennas and Wave Propagation	
Course code: E003	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Wajnert Dawid, d.wajnert@po.opole.pl	
Prerequisites: English (min B1 level), completed mathematical and physical course, good ability in mathematical problems.	
Objectives of the course and learning outcomes: The graduate has knowledge about antenna theory and electromagnetic wave propagation. The graduate can determine antennas to the wireless communication system.	
Teaching program: 1. Introduction Maxwell equations. Plane electromagnetic wave. Electromagnetic spectrum. 2. Transmission lines Transmission line model. Equations of transmission line. The Smith chart. Matching of transmission lines. 3. Antenna parameters Radiation pattern. Directivity. Gain. Antenna efficiency. Radiation efficiency. Frequency bandwidth. Input impedance. Antenna effective area. Antenna polarization. 4. Description of antenna models Half wavelength dipole. Monopole antenna. Folded dipole. Uda-Yagi antenna. Log-periodic antenna. Horn antenna. Reflector antenna. 5. Propagation of electromagnetic waves Atmospheric propagation. Reflection. Diffraction. 6. Basic methods in antenna measurements Open area test site. Anechoic chamber. Measurement of antenna parameters.	
Assessment methods: The assessment of the student will occur on the basis of essay and written test paper examination. The essay has to be finished at the end of the semester. The written test will be held at the end of semester.	
Recommended reading: Cheng D.K.: Field and wave electromagnetics, Addison-Wesley Publishing Company, 1983 Kraus J.D.: Antennas, Tata McGraw-Hill Publishing Company Limited, New Delhi, 1997 Balanis C.A.: Antenna theory: Analysis and design, Wiley-Interscience, 3rd edition, USA, 2005	

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Course name: CAD I - lecture	
Course code: E005	Form of class: Lecture,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Dzierżanowski Łukasz, l.dzierzanowski@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: The graduate can draw a 2D model in autoCAD	
Teaching program: 1. The interface 2. Drawing tools 3. Editing tools 4. Layers 5. Dimensions 6. Blocks 7. Layouts and printing	
Assessment methods: coursework	
Recommended reading: AutoCAD 2017 Help Finkelstein Ellen, AutoCAD 2015 and AutoCAD LT 2015 Bible 1st Edition, Wiley, 2015 Omura G., Mastering AutoCAD 2016 and AutoCAD LT 2016, Autodesk Official Press, 2016	

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Course name: CAD I - lab	
Course code: E006	Form of class: Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Dzierżanowski Łukasz, l.dzierzanowski@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: The graduate can draw a 2D model in autoCAD	
Teaching program: 1. The interface 2. Drawing tools 3. Editing tools 4. Layers 5. Dimensions 6. Blocks 7. Layouts and printing	
Assessment methods: Coursework	
Recommended reading: AutoCAD 2017 Help Finkelstein Ellen, AutoCAD 2015 and AutoCAD LT 2015 Bible 1st Edition, Wiley, 2015 Omura G., Mastering AutoCAD 2016 and AutoCAD LT 2016, Autodesk Official Press, 2016	

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Course name: CAD II	
Course code: E007	Form of class: Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Dzierżanowski Łukasz, l.dzierzanowski@po.opole.pl	
Prerequisites: English (min B1 level), CAD I	
Objectives of the course and learning outcomes: The graduate can draw a 3D model in AutoCAD	
Teaching program: 1. The interface 2. 3D Drawing tools 3. 3D Editing tools 4. Dynamic blocks 5. Rendering	
Assessment methods: Project	
Recommended reading: Finkelstein Ellen, AutoCAD 2015 and AutoCAD LT 2015 Bible 1st Edition, Wiley, 2015 Omura G., Mastering AutoCAD 2016 and AutoCAD LT 2016, Autodesk Official Press, 2016	

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Course name: CAD III	
Course code: E008	Form of class: Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Dzierżanowski Łukasz, l.dzierzanowski@po.opole.pl	
Prerequisites: English (min B1 level), CAD I	
Objectives of the course and learning outcomes: The graduate can draw a 3D parametrical drawing model in Autodesk Inventor	
Teaching program: 1. The interface 2. Sketches 3. Parts 4. Assembly Drawings 5. Rendering 6. Animation	
Assessment methods: Project	
Recommended reading: Inventor 2017 Help Munford P., Normand P., Mastering Autodesk Inventor 2016 and Autodesk Inventor LT 2016, Autodesk Official Press, 2015 Banach D., Jones T., Autodesk Inventor 2016 Essentials Plus, Autodesk Inventor 2016 Essentials Plus, SDC Publications 2015	

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Course name: Circuit Theory	
Course code: E009	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 8	Start date: October, February
Number of hours per week: 3	Number of hours per semester: 45
Language of instruction: English	
Name of the lecturer and contact information: Waindok Andrzej, a.waindok@po.opole.pl	
Prerequisites: English (min B1 level), completed mathematical and physical course, good ability in mathematical problems	
Objectives of the course and learning outcomes: The student could solve the basic problems in the area of electric circuit theory for DC and AC currents. He gets the ability to design simply electrical circuits.	
Teaching program: 1. Introduction The physics of electrical current. Forces and work in electrical circuits. Passive components. 2. Voltage and current sources Step, impulse, ramp, sinusoidal and DC currents. Ideal and practical sources. Controlled sources. 3. Linear circuit analysis Voltage and current laws. Node and mesh analysis. Power and energy. Using complex numbers in AC circuit analysis. 4. Three phase circuits 5. Non-sinusoidal period signals. Fourier analysis in the case of impulse, pulse and triangle shape currents. 6. Nonlinear circuits Diodes, transistors and rectifiers.	
Assessment methods: The assessment of the student work will occur on the basis of written essay and written paper examination. The essays has to be ready at the end of the semester. The written test will be held at the end of semester. The exam durations will be about 1,5 hour.	
Recommended reading: [1] Dorf R.C.: The electrical engineering handbook, CRC Press LLC, USA, Boca Raton, 2000. [2] Laughton M.A., Warne D.F.: Electrical Engineer's Reference Book (16th Edition), Elsevier, 2003. [3] Kaplan D.M., White C.G.: Hands-On electronics – a practical introduction to analog and digital circuits, Cambridge University Press, UK, 2003 [4] Bakshi U.A., Bakshi A.V.: Circuit theory, Technical publication Pune, 2009.	

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Course name: Computer Management Systems	
Course code: E010	Form of class: Lecture,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Radziewicz Wojciech, w.radziewicz@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge about functioning of companies. Basic knowledge of management systems.	
Objectives of the course and learning outcomes: The graduate has a knowledge about the differences between computer management systems used in different countries. The graduate can estimate the possibilities of using chosen ERP system in the company.	
Teaching program: Introduction to the computer management systems. Data and digital information. Evolution of computer management systems. ERP systems. Analysis and selection proper computer management system. Computer systems for small and medium enterprises. Customer relationship management systems. Data warehouses.	
Assessment methods: The assessment of the student's work will occur on oral examination and finished project. The project has to be ready by the end of the semester.	
Recommended reading: • Beynon-Davies P.: Information Systems: an introduction to informatics in Organizations. Palgrave, Basingstoke, UK., 2002, • Clarke S.: Information Systems Strategic Management: An Integrated Approach, Routledge, 2007, • Curtis G., Cobham D.: Business Information Systems: Analysis, Design and Practice, Pearson Education, 2008.	

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Course name: Data Base I	
Course code: E011	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Paszkiel Szczepan, s.paszkiel@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge about data base. Basic knowledge of SQL.	
Objectives of the course and learning outcomes: The graduate has a knowledge about the differences relation databases and objective data bases. The graduate knows Structured Query Language.	
Teaching program: 1. Data model 2. Design of relational databases 3. SQL 4. DDL 5. PL/SQL language 6. Entity Relationship Modeling 7. Transaction processing 8. Authorize access to the database	
Assessment methods: Presentation, coursework	
Recommended reading: Tom Pender: Database Systems: The Complete Book, 2008. Alan Beaulieu, Learning SQL, O`reilly, 2009 Anthony Molinaro, SQL Cookbook, O`reilly, 2005	

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Course name: Data Structures	
Course code: E012	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Paszkiel Szczepan, s.paszkiel@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge about data structures.	
Objectives of the course and learning outcomes: The graduate has knowledge about personal computer's architecture and about the most popular operating systems. The graduate can determinate the necessary hardware needed for the company according to size and the profile of that firm.	
Teaching program: 1. Introduction to data structures. 2. Stacks and queues. 3. Graph data structures. Graph algorithms. 4. Optimization algorithms graphs: Dijkstra, Floyd-Warshall, Bellman-Ford. Euler and Hamilton cycles. 5. Methods for the exploration of graphs: Breadth-first search and Depth-first search - pseudo code, flowchart, code in C /C#. 6. Trees. Binary trees. Methods of browsing trees: preorder, inorder, postorder. Representation of algebraic expressions.	
Assessment methods: Presentation, coursework.	
Recommended reading: Wirth N., Algorithms Data Structures = Programs Aho, A. V., Hopcroft, J. E., Ullman, J. D., The Design and Analysis of Computer Algorithms Knuth D E. The art of computer programming. Volume 1, Volume 2, Volume 3	

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Course name: Designing of data bases	
Course code: E013	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Paszkiel Szczepan, s.paszkiel@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge about data base. Basic knowledge of indexes and transactions.	
Objectives of the course and learning outcomes: The graduate knows antipatterns in DB. The graduate has a knowledge about the differences relation databases and objective data bases.	
Teaching program: 1. The design process – a conceptual overview. Indexes, transactions, and optimizing SQL statements. 2. Logical Database Design Antipatterns: Jaywalking, Naive Trees, ID Required, Keyless Entry 3. Physical Database Design Antipatterns: Rounding Errors, 31 Flavors, Phantom Files, Index Shotgun 4. Query Antipatterns: Fear of the Unknown, Ambiguous Groups, Random Selection, Poor Man's Search Engine, Spaghetti Query 5. Application Development Antipatterns: Readable Passwords, SQL Injection, Pseudokey Neat-Freak, See No Evil	
Assessment methods: Presentation, coursework.	
Recommended reading: Tom Pender: Database Systems: The Complete Book, 2008. Alan Beaulieu, Learning SQL, O`reilly, 2009 Anthony Molinaro, SQL Cookbook, O`reilly, 2005	

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Course name: Digital Signal Processors	
Course code: E014	Form of class: Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Górecki Krzysztof, k.gorecki@po.opole.pl	
Prerequisites: English (min B1 level), Basics of C language, basics of mathematics, basics of microprocessor technology.	
Objectives of the course and learning outcomes: As a result of the course student should know: main features of different families of DSPs processors, characterizing an comparing peripherals of DSP architecture, using peripheral of TMS320C6713 in signal analysis, using Environment of programming Texas Instruments DSP's, projecting and programming simple systems for signal processing (filters, generators)	
Teaching program: Programing environment: Code Composer Studio. Architecture of Digital Signal Processor (DSP) - central processor units, instructions (MAC operations), assembler, cooperating CPU with memories Peripherals of DSP: timers, interruptions - using timers in leds control and using switches. Measuring of periodic signal parameters (fundamental frequency, amplitude, RMS value, period, average value, integral of signal, etc.) Using external codecs - A/D and D/A converters. Projecting and implementation FIR and IIR filters on DSP (TMS320C6713). Implementation of FFT algorithms on DSP (TMS320C6713).	
Assessment methods: Individual programing in laboratory - 3 programs in C language (20 % each) and one project - FIR, IIR or FFT (40%).	
Recommended reading: 1. www.ti.com: spru301c.pdf - TMS320C6000 Code Composer Studio Tutorial, 2. www.ti.com: C6713 data sheet: TMS320C6713.pdf, 3. Lyons R. G.: Understanding Digital Signal Processing, Prentice Hall, New Jersey 2004. 4. DSP implementation using TMS320C6711, TMS320C6713 and TMS320C6416. Texas Instruments teaching ROM.	

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Course name: Digital Visualisation - lecture	
Course code: E015	Form of class: Lecture,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Dzierżanowski Łukasz, l.dzierzanowski@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of computer graphics	
Objectives of the course and learning outcomes: The graduate can create a digital visualisation with knowledge of composition, lightning and color use principles.	
Teaching program: 1. Composition 2. Color Models 3. Shadows and occlusion 4. Cameras and lenses 5. Image formats	
Assessment methods: Presentation	
Recommended reading: Autodesk 3Ds Max Help, Freeman, M., The Photographer's Eye: Composition and Design for Better Digital Photos, Focal Press Derakhshani, D., Derakhshani R., Autodesk 3ds Max 2016 Essentials, Sybex	

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Course name: Digital Visualisation - project	
Course code: E016	Form of class: Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Dzierżanowski Łukasz, l.dzierzanowski@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of computer graphic	
Objectives of the course and learning outcomes: The graduate can create a digital visualisation with knowledge about composition, lightning and color use principles.	
Teaching program: 1. Composition 2. Color Models 3. Shadows and occlusion 4. Cameras and lenses 5. Image formats	
Assessment methods: Project.	
Recommended reading: Autodesk 3Ds Max Help, Freeman, M., The Photographer's Eye: Composition and Design for Better Digital Photos, Focal Press Derakhshani, D., Derakhshani R., Autodesk 3ds Max 2016 Essentials, Sybex	

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Course name: Electrical and Electronic Metrology	
Course code: E018	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Wrzuszcak Maria, m.wrzuszcak@po.opole.pl	
Prerequisites: English (min B1 level), Basics of Electronics	
Objectives of the course and learning outcomes: Basic of metrology, introduction to the measurement equipment and estimating the uncertainty	
Teaching program: Metrology standards, International standards organizations, static and dynamic parameter of transducers. Accuracy of measurement, uncertainty. Measurement of current, voltage, resistance. Analog to digital conversion and digital to analog conversion, digital multimeters and oscilloscopes	
Assessment methods: laboratory report , oral examination	
Recommended reading: Mc Ghee J., Korczyński A., Kulesza W.: Scientific Metrology, Lodart, Łódź, Poland 1998 Mc Ghee J., Kulesza W., Korczyński A., Henderson J.: Measurement Data Handling, Lodart, Łódź, Poland 2000	

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Course name: Electromagnetic Field Theory	
Course code: E019	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Waindok Andrzej, a.waindok@po.opole.pl	
Prerequisites: English (min B1 level), completed mathematical and physical course, good ability in mathematical problems.	
Objectives of the course and learning outcomes: The student could solve the basic problems in the area of magnetostatic and electrostatic fields, electromagnetic waves and magnetic circuits. He gets the ability to design simply magnetic devices.	
Teaching program: 1. Vector Analysis. Scalar and vector fields. Gradient of a scalar field. Divergence and curl of a vector field. Physical interpretations. Laplacian. Nabla operator. Divergence theorem (Gauss). Stokes theorem. 2. Electrostatic fields in vacuum. Electric Charge and Coulomb's Law. Electric field and electric potential. Laplace and Poisson equations. Capacitors. Potential energy of a group of loads. Electrostatic energy load distribution. Dipoles. 3. Electrostatics in dielectric media. Electric field due to a polarized material. Gauss's Law in a dielectric. Electrostatic boundary conditions in the homogenous and non-homogenous media. Electrostatic energy density in dielectric media. Forces and moments in an electrostatic system. 4. Magnetostatic fields in vacuum. Biote-Savarte-Laplace Law. Solenoidal character of the magnetic induction field. Vector potential. Ampere's Law. Laplace and Poisson equations in magnetostatic field. 5. Magnetism in different materials. Parameters of dia-, para- and ferromagnetic materials. Magnetic field due to a magnetized material. Hysteresis loops in ferromagnetic materials. Magnetic Circuits. Magnetic energy density in linear and nonlinear media. Forces and moments on rigid circuits.	
Assessment methods: The assessment of the student work will occur on the basis of written essay, oral examination and done project. The essays and projects have to be ready at the end of the semester. The oral examination will be held at the end of semester. The exam durations will be about 1,5 hour.	
Recommended reading: [1] Chen H. C.: Theory of Electromagnetic Waves, McGraw-Hill, New York, 1983. [2] Paul C.R., Nasar S.A.: Introduction to electromagnetic fields, McGraw-Hill, New York, 1982. [3] van Bladel J.G.: Electromagnetic Fields, 2nd Edition, Wiley-IEEE Press, New York, 2007. [4] Rothwell E.J., Cloud M.J.: Electromagnetics, 2nd Edition, Boca Raton, CRC Press, 2009. [5] Moliton-Limoges A.: Basic electromagnetism and materials, Springer, 2007.	

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Course name: Electronic Circuits	
Course code: E020	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Wrzuszcak Maria, m.wrzuszcak@po.opole.pl	
Prerequisites: English (min B1 level), Basics of Electronics	
Objectives of the course and learning outcomes: Introduction to the analog and digital circuits	
Teaching program: Voltage amplifier with transistors and operation amplifiers, voltage transfer function, comparators, differential amplifier, sinus oscillators, power supply, stabilisation circuits, power amplifier, astable, monostable, bistable circuits, Schmitt trigger, digital electronic circuits, logical gates, flip-flops, binary counter and register.	
Assessment methods: course work, oral examination	
Recommended reading: Alexander Ch., Sadiku M.: Fundamentals of Electronic Circuits, Mc Graw Hill 2004 Hayes J.: Introduction to Digital Logic Design, Addison Wesley 1993 Millman J., Halkias Ch.: Electronic Devices and Circuits, e.book 2016	

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Course name: Embedded Systems	
Course code: E021	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 2	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Podpora Michał, m.podpora@po.opole.pl	
Prerequisites: English (min B1 level), Basics of computer architecture, operating systems, programming.	
Objectives of the course and learning outcomes: The student is able to: - design a basic Embedded System - wire the hardware prototype - implement software of the Embedded System to get the desired functionality - estimate cost and time needed for designing and implementing a prototype of a specific Embedded System - refine his/her knowledge using Internet resources and whitepapers	
Teaching program: - Arduino basics - Arduino digital I/O - Arduino analog inputs and PWM outputs - Arduino and OneWire, serial, I2C, SPI, etc. - Arduino shields - Raspberry Pi digital I/O - Raspberry Pi interfacing with other systems - Mobile UGV robot - Intelligent home system The student will have the possibility to get the hands-on practical knowledge on Embedded Systems, their principles, design, and implementation.	
Assessment methods: Lecture - written/test paper examination, Laboratory - laboratory report	
Recommended reading: [1] White E., „Making Embedded Systems”, O'Reilly, ISBN 978-1449302146 , 2011 [2] Williams G.H., „Making Things Smart: Easy Embedded ARM Programming For Transforming Everyday Objects Into Intelligent Machines”, ISBN 978-1680451894, 2016 [3] Lee E.A., Seshia S.A., „Introduction to Embedded Systems”, available on-line (2016-12): leeseshia.org	

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Course name: Final Project	
Course code: E022	Form of class: Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 7	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Tomaszewski Michał, m.tomaszewski@po.opole.pl Zatwarnicki Krzysztof, k.zatwarnicki@po.opole.pl Zmarzły Dariusz, d.zmarzly@po.opole.pl	
Prerequisites: English (min B1 level), Student finishes the studies, and joins the project at his final year.	
Objectives of the course and learning outcomes: Defining the aim and spectrum of the project. Fullfilling specified tasks needed to achieve the goal of the project.	
Teaching program: As arranged with the tutor at home university	
Assessment methods: ---	
Recommended reading: ---	

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Course name: Hardware Development in Personal Computers	
Course code: E023	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Radziewicz Wojciech, w.radziewicz@po.opole.pl	
Prerequisites: English (min B1 level), Computer architecture and computer science basics.	
Objectives of the course and learning outcomes: The graduate has knowledge about personal computer's architecture and about the most popular operating systems. The graduate can determinate the necessary hardware needed for the company according to size and the profile of that firm.	
Teaching program: Introduction to the computer architecture. History of computer architecture. Classification of computers. Structure of processors. Main boards, memories and hard drives. Introduction to the operating systems. Classification of operating systems. Memory management. Summary about computer architecture and operating systems.	
Assessment methods: The assessment of the student's work will occur on oral examination and finished project. The project has to be ready by the end of the semester.	
Recommended reading: • John L. Hennessey, David A. Patterson, "Computer Architecture – A quantitative approach", Morgan Kaufmann / Elsevier, 4th. edition, 2007, • Behrooz Parhami, "Computer Architecture", Oxford University Press, 2006, • Sachin Kadam, "Computer Architecture and Maintenance", Shroff Pub	

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Course name: High Voltage Electrical Equipment Diagnostics	
Course code: E024	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 4	Number of hours per semester: 60
Language of instruction: English	
Name of the lecturer and contact information: Kunicki Michał, m.kunicki@po.opole.pl	
Prerequisites: English (min B1 level), Basic Phenomena in High Voltage Engineering, Fundamentals of Electrical Power Engineering	
Objectives of the course and learning outcomes: After the course, the students should be able to know and understand diagnostic methods of high voltage electrical equipment.	
Teaching program: 1. Introduction. 2. Hazards and safety in High Voltage engineering 3. Examples of High Voltage Electrical Equipment 4. Physical aspects of common High Voltage Electrical Equipment failures 5. High Voltage Apparatus basic diagnostics methods 6. Contemporary Advanced Diagnostic Methods and Systems in application 7. Example of Electrical Equipment diagnostics – case study. Partial Discharges in power transformer. 8. Failure detection in High-Voltage electrical equipment (Connection Problems, Overloading, Design Defects, Moisture, Hot-spots, Insulation degradation...)	
Assessment methods: The assessment of the student work will occur on the basis of an individual written project. The final project should be also oral presented at the end of the semester.	
Recommended reading: 1. Insulation of High-Voltage Equipment, Ushakov, V.Y., Springer-Verlag, Berlin 2004. 2. High Voltage Engineering Problems and Solutions, Begamudre, R.D., New Age International Pvt Ltd Publishers, 2010. 3. High-Voltage Test and Measuring Techniques, Hauschild, W., Lemke, E., Springer-Verlag, Berlin 2014. 4. High Voltage Engineering. Practice and Theory, Vosloo, Wallace ; Holtzhausen, Koos ; Sellenbosch, 2008.	

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Course name: Image Processing in Computer Forensics	
Course code: E025	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Podpora Michał, m.podpora@po.opole.pl	
Prerequisites: English (min B1 level), Computer graphics (basics), Programming (any computer language)	
Objectives of the course and learning outcomes: Student: - is able to deal properly with electronic evidence - has knowledge regarding basic techniques, tools and algorithms for image investigation (including Error Level Analysis and Hyperspectral Imaging) - is able to discover and describe: what operations/manipulations were made to a digital image by comparing two images in a graphical software (and present the results in a report) - is able to discover and describe: what operations/manipulations were made to a digital image by investigating only the final image using a professional forensic graphical software (and present the results in a report)	
Teaching program: - Operational work reports - Digital image acquisition methods - Quality of digital image - Basic modifications of digital image - Verification of the authenticity of digital image - Verification of the authenticity of printed documents - Hyperspectral imaging - Tools and methods for analysis of video streams The student must prepare for and accomplish two exercises/cases - of digital image analysis and one more complex case/analysis (requiring development of his/her own forensic software, implementing ErrorLevelAnalysis algorithm). Each analysis should be accompanied by an exercise report and an operational work report.	
Assessment methods: Lecture - written/test paper examination, Laboratory - laboratory report	
Recommended reading: [1] H. Farid, Photo Forensics, MIT Press, 2016 [2] Fotoforensics.com, Error Level Analysis tutorial, available on-line (2016-XII): http://fotoforensics.com/tutorial-ela.php [3] AmpedSoftware.com, Amped FIVE forensic video enhancement software, available on-line (2016-XII): https://ampedsoftware.com/five	

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Course name: Information Technology	
Course code: E026	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Paszkiel Szczepan, s.paszkiel@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge about informatics.	
Objectives of the course and learning outcomes: The graduate has a knowledge about the information technology. The graduate has a knowledge about the Information and communications technology.	
Teaching program: 1.Introduction to information technology. 2.Binary numeral system - Binary arithmetic. 3.Boolean algebra. 4.Local Area Network - network protocols. 5.Internet, internet services. 6.Algorithms and data structures. 7.Brain Computer Interfaces. 8.Data Base - relation, SQL. 9.Bases of the theory of the graphics.	
Assessment methods: Presentation, coursework	
Recommended reading: •Wirth N., Algorithms Data Structures = Programs. Wyd. Prentice-Hall Of India Pvt. Ltd. •Gleick, James, The Information: A History, a Theory, a Flood. New York: Pantheon Books, 2011.	

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Course name: Internet Technology	
Course code: E027	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Paszkiel Szczepan, s.paszkiel@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge about internet technology. Basic knowledge of HTML, CSS, PHP.	
Objectives of the course and learning outcomes: The graduate has a knowledge about the differences HTML 5, PHP, ASP, Ruby. The graduate knows internet technology.	
Teaching program: 1.HyperText Markup Language - HTML 5 2.Cascading Style Sheets - CSS 3.JAVAScript 4.Introduction to PHP 5.Introduction to MySQL 6.ASP.NET 7.MS SQL Server	
Assessment methods: Presentation, coursework	
Recommended reading: •Jon Duckett, HTML and CSS: Design and Build Websites, 2011 •Jon Duckett, JavaScript and JQuery: Interactive Front-End Web Development, 2014 •Jennifer Robbins, Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics, 2012	

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Course name: Introduction to Computer Forensics	
Course code: E028	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Podpora Michał, m.podpora@po.opole.pl	
Prerequisites: English (min B1 level), Computer's architecture, basics of operating systems	
Objectives of the course and learning outcomes: Student is able to deal properly with electronic evidence, is able to retrieve data/evidence from a device and present the results in a report, is able to recover deleted data/evidence from a device and present the results in a report.	
Teaching program: Operational work reports Retrieving volatile data Using specialized forensic hardware tools – forensic blockers Retrieving data/evidence from a device Recovering deleted data/evidence from a device	
Assessment methods: A student must accomplish three exercises/cases – of harddrive (or other media) analyses and one more complex case/analysis (requiring data recovery and some open intelligence activities). Each analysis should be accompanied by an exercise report and an operational work report.	
Recommended reading: Cowen D., "Computer Forensics, a Beginner's Guide", McGraw-Hill/Osborne Media, ISBN 9780071742450, 2013 Watson D., Jones A., "Digital Forensics Processing and Procedures: Meeting the Requirements of ISO 17020, ISO 17025, ISO 27001 and Best Practice Requirements", Syngress Publishing, ISBN 9781597497428, 2013	

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Course name: Introduction to Cybersecurity	
Course code: E029	Form of class: Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Gola Mariusz, m.gola@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: By the end of this course, students will be able to protecting themselves against cyberattacks.	
Teaching program: The Introduction to Cybersecurity is designed for students who are considering IT as career with specialization in cybersecurity. This exploratory course provides the students an introduction to cybersecurity. The curriculum will explore ways to be safe online, learn the different types of malware and attacks, measures used by organizations to mitigate the attacks, and research their career opportunities. The curriculum is appropriate for students at many education levels and types. Students learn the basics of being safe online. Students are introduced to different types of malware and attacks, and how organizations are protecting themselves against these attacks. Students explore the career options in cybersecurity. The language used to describe cybersecurity concepts is designed to be easily understood by learners at all levels and embedded interactive activities help reinforce comprehension.	
Assessment methods: on-line tests	
Recommended reading: • Cybersecurity and Cyberwar: What Everyone Needs to Know® 1st Edition, P.W. Singer, Allan Friedman • CompTIA Security : Get Certified Get Ahead: SY0-401 Study Guide Paperback – October 25, 2014, Darri Gibson • Networking: A Beginner's Guide, Sixth Edition, Bruce Hallberg	

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Course name: Introduction to Networks	
Course code: E030	Form of class: Lecture,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Gola Mariusz, m.gola@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: By the end of the course, students will be able to build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes	
Teaching program: Introduces the architecture, structure, functions, components, and models of the Internet and computer networks. The principles of IP addressing and fundamentals of Ethernet concepts, media, and operations are introduced. Course describes: • the devices and services used to support communications in data networks and the Internet • the role of protocol layers in data networks • the importance of addressing and naming schemes at various layers of data networks in IPv4 and IPv6 environments • Build a simple Ethernet network using routers and switches • Use Cisco command-line interface (CLI) commands to perform basic router and switch configurations	
Assessment methods: on-line tests	
Recommended reading: • Computer Networking: A Top-Down Approach (7th Edition), James Kurose, Keith Ross • Computer Networks (5th Edition), Andrew S. Tanenbaum, David J. Wetherall • Networking: A Beginner's Guide, Sixth Edition, Bruce Hallberg	

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Course name: Mathematical Modeling	
Course code: E031	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Wrzuszcak Janusz, j.wrzuszcak@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Learning simulation methods of dynamical systems	
Teaching program: Developing a mathematical model of dynamic systems and plants. Discrete, continuous and hybrid systems. Ordinary differential equations, difference equations. Creating dedicated own modules based on scripts for Simulink functions. Building of extended and hierarchical models. Trimming and linearization of models. Testing of linearized models. Computer simulation of systems in Matlab /Simulink environment. Optimizing computation time of simulation and a quality of simulation results depending on applied mathematical integrating methods and its parameters.	
Assessment methods: Laboratory report	
Recommended reading: 1. Documentation for Simulink of The MathWorks 2. Frank W. J. Olver NIST Handbook of Mathematical Functions, 2012 3. F. Morrison, The art of modeling dynamic systems, 1991	

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Course name: Microprocessors technology - Lecture	
Course code: E032	Form of class: Lecture,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Szmajda Mirosław, m.szmajda@po.opole.pl	
Prerequisites: English (min B1 level), Basics of: Information Technology, C language, Electronics, Digital Electronics.	
Objectives of the course and learning outcomes: • Basics of microprocessors systematic. • Basics of microprocessor system work in general. • Introducing of chosen microcontroller (8051, MSP430, TMS320c28x or ARM). • Gathering information about implementation of chosen microcontroller in embedded systems.	
Teaching program: • Codes and arithmetic of codes used in microcontrollers. • Introducing following terms: microprocessors , microcontrollers, analogue microcontrollers, mixed-signal microcontrollers, digital signal controller, digital signal processor, system on a chip; IP cores, FPGA, embedded systems. • General architecture and operation of microprocessor systems. • Detailed information about chosen microcontrollers (8051, MSP430, TMS320c28x or ARM) including: CPU, instructions, assembler, memory map, interruption system, GPIOs, timers, serial ports, ADC, DAC, LCD drivers, IDE environment. • Basic information about creating microprocessors systems. • The "Microprocessor Technology - Lecture" is obligatory to take cooperating subject "Microprocessor Technology - Laboratory".	
Assessment methods: oral or written exam	
Recommended reading: • www.ti.com: MSP430 teaching ROM, • www.ti.com: TMS320c28x teaching ROM, • www.ti.com: application notes of MSP430 and TMS320c28x families • John H. Davies: MSP430 Microcontroller Basics, Elsevier 2008. • Nagy C.: Embedded Systems Design using the TI MSP430 Series. Elsevier, Burlington. • Ball S.: Embedded Microprocessor Systems: Real World Design, Newnes, Burlington 2002	

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Course name: Microprocessor Technology - laboratory	
Course code: E033	Form of class: Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Szmajda Mirosław, m.szmajda@po.opole.pl	
Prerequisites: English (min B1 level), Basics of: Information Technology, C language, electronics, digital electronics. Obligatory basic subject: Microprocessors technology - Lecture.	
Objectives of the course and learning outcomes: Creating simple C and assembly codes in Integrated Development Environment (IDE, writing software on chosen CPU (8051, MSP430, TMS320c28x or ARM) and its peripherals, Creating simple project.	
Teaching program: Introduction to IDE. Assembly and C code for controlling General Purpose Input Output Pins (GPIO). CPU arithmetic and working with memory. Low power modes, interrupt system and external interrupts. Clocking system and timer. Serial ports: UART, SPI, IIC. Analog to Digital Converter (ADC) and LCD drivers. Simple project.	
Assessment methods: Writing 6 basic programs and creating simple project. Final mark will be mean from programs and project marks.	
Recommended reading: 1. www.ti.com: MSP430 teaching ROM, 2. www.ti.com: TMS320c28x teaching ROM, 3. www.ti.com: application notes of MSP430 and TMS320c28x families 4. John H. Davies: MSP430 Microcontroller Basics, Elsevier 2008.	

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Course name: Mobile robots	
Course code: E034	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 3	Number of hours per semester: 45
Language of instruction: English	
Name of the lecturer and contact information: Beniak Ryszard, r.beniak@po.opole.pl	
Prerequisites: English (min B1 level), Programming in Maple or Matlab package, modelling and simulations of simple mechanical and electromechanical objects. Basic knowledge of controls of same manipulators.	
Objectives of the course and learning outcomes: Ability to the modelling of robot motion in passed labyrinth process, according with received system of sensors and the control with regard of arrangement of masses and their influence on maximum moments which can transfer every wheel.	
Teaching program: 1. Selection the shape and the dimensions of mobile robot. Semiconductor components: semiconductor diodes, thyristors, field-effect transistors and insulated gate bipolar transistors. 2. Choice the systems of sensors control system and the driving motors. 3. Regard the distribution of masses accordingly with robot construction and the calculation (take into account the coefficient of friction) the maximum of the moments, which can be transferred by driving system. • the sum of masses multiplied by gravitational acceleration minus the reaction forces of the wheels is equal zero; • the sum of torque's produced by mass of elements and the re-action forces of the wheels in relation to chosen point carries out zero. 4. Peaceably with Application Demonstration from Maple soft modelling of kinematics and the dynamics of robot. 5. Regard the system of sensors in aim of realisation of the motor controls (for example the DC motors voltages). 6. Modelling, simulation and simple graphical presentation the movement of robot in definite labyrinth.	
Assessment methods: Testing final results of project.	
Recommended reading: 1) F. Fahim: Autonomous Robots: Modeling, Path-Planning and Control, New York, London, Springer, 2008. 2) M. Spong, M. Vidyasagar: Robot Dynamics and Control, John Wiley	

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Course name: Network Operating Systems Administration	
Course code: E035	Form of class: Lecture,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Pelc Mariusz, m.pelc@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: • Install Linux operating system - distribution-specific installation; • Manage local and remote users, groups and system resources according to specified requirements; • Install, configure and securely administrate selected network services and mechanisms; • Install, configure and manage security-related system mechanisms.	
Teaching program: • SHELL Programming I • SHELL Programming II • Using Perl for system administration-related tasks • Multi-interface routing • DHCP server installation and configuration • DNS server installation and configuration I • DNS server installation and configuration II • FTP server installation and configuration • HTTP server installation and configuration (HTTP/HTTPS protocols) • MAIL server installation and configuration • SAMBA server installation and configuration • SELinux configuration • Kickstart and automation of administrative tasks	
Assessment methods: Exam / Test	
Recommended reading: Hobson, J., CentOS 6 Linux Server Cookbook, Packt Publishing, 2013, ISBN: 1849519021 Hobson, J., Pelz, O., CentOS 7 Linux Server Cookbook - Second Edition, Packt Publishing, 2016, ISBN: 1785887289 Jang, M., RHCSA/RHCE Red Hat Linux Certification Study Guide (Exams EX200)	

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Course name: Object Programming for CAD	
Course code: E036	Form of class: Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Dzierżanowski Łukasz, l.dzierzanowski@po.opole.pl	
Prerequisites: English (min B1 level), CAD I	
Objectives of the course and learning outcomes: The graduate can write useful programs for autoCAD purposes	
Teaching program: 1. The Object ARX idea 2. AutoCAD object models 3. Programming layers 4. Programming selection sets 5. Programming blocks 6. Programming views	
Assessment methods: Project	
Recommended reading: AutoCAD 2017 Help http://www.autodesk.com/objectarx McAuley C., Programming AutoCAD in ObjectARX (Autodesk's Programmer), Autodesk Press	

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Course name: Operating Systems I	
Course code: E037	Form of class: Lecture,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Pelc Mariusz, m.pelc@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: On completing this course successfully the student will be able to: • Critically describe the main components of a computer and understand how these are managed by the operating system. • Explain the structure and design decisions involved in the implementation of an operating system. • Discuss the issues involved in the management and security of an operating system.	
Teaching program: • Operating Systems and Processors Architectures • Processes Handling • Scheduling • Memory Management • File Systems Architectures • Concurrency • System Kernels • Virtualisation • System Security Basics • Introduction To Shell Scripting	
Assessment methods: Exam / test	
Recommended reading: Stallings, W., Operating Systems: Internals and Design Principles, Global Edition, Pearson Education; 8 edition, 2014, ISBN: Pearson Education; 8 edition Silberschatz, A., and Galvin, P. B., Operating System Concepts, John Wiley	

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Course name: Operating Systems II	
Course code: E038	Form of class: Lecture,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Pelc Mariusz, m.pelc@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: On completing this course successfully the student will be able to: • Understand fundamental differences between various Linux distributions • Manage selected system mechanisms • Install and configure hardware; • Understand basic security mechanisms.	
Teaching program: • Linux system distributions • Exploring Linux Command Line Tools • Managing Software • Configuring Hardware • Managing Files • Booting Linux • Managing System Resources • Configuring Basic Networking • Scripting Basics	
Assessment methods: Exam / test	
Recommended reading: Siever, E., and Figgins, S., Linux in a Nutshell, O'Reilly Media; 6 edition, 2009, ISBN: 0596154488 Schroder, C., Linux Networking Cookbook, O'Reilly Media; 1 edition, 2007, ISBN: 0596102488 Negus, C., Linux Bible, John Wiley	

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Course name: Power Electronics I	
Course code: E039	Form of class: Lecture, Group tutorial, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Beniak Ryszard, r.beniak@po.opole.pl	
Prerequisites: English (min B1 level), The basic knowledge from electrical engineering and electronics. Knowledge of methods of analytical integration and solving simple differential equations.	
Objectives of the course and learning outcomes: To enhance knowledge and understanding of power electronic converters and their application in power electronic systems. To provide students with the skills and techniques necessary to analyse and synthesise power electronic circuits utilising modern power electronic devices. Intended Knowledge Outcomes An understanding of the principles of power electronic converters. An understanding of power electronics devices and their application in power electronic converters. An understanding of the application of power electronic converters in the management of electrical energy. Intended Skill Outcomes Ability to analyse and synthesise simple power electronic converters and systems.	
Teaching program: - Fundamentals of current conduction in solids, semiconductors structure. - Semiconductor components: semiconductor diodes, thyristors, field-effect transistors and insulated gate bipolar transistors. - Line-commutated rectifiers: system components for rectification, single-pulse rectifier with resistive and inductive loads, current and voltage value. Two-pulse rectifier, centres tap and bridge in rectifier and inverter operation. Three-pulse rectifier and six-pulse rectifier. - Operational behaviour of line-commutated rectifiers: operation and power chart, active power, apparent power and reactive power; power charts, harmonic analysis. - Self-controlled converter. The function of d.c. choppers (step down chopper and step up chopper) and self-controlled inverters (inverter with voltage source d.c. link and inverter with current source d.c. link) are explained.	
Assessment methods: Alternative three possibilities of credit: or independent solution 6 tasks (coursework: every student has different set) or oral or written examination.	
Recommended reading: N. Mohan, T M Undeland and WP Robbins: Power Electronics - Converters Applications and Design, Notes: John Wiley	

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Course name: Programming Graphic Applications	
Course code: E040	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kamiński Marcin, m.kaminski@po.opole.pl	
Prerequisites: English (min B1 level), Basic programming skills in Java programming language	
Objectives of the course and learning outcomes: Introductory level course of bitmaps processing algorithms implemented in Android operating system	
Teaching program: Basic course of programming graphical applications implemented in the operating system Android. The course discusses tools for building applications running under Android. Another element of the course are issues concerning methods of construction applications running on the system with special emphasis on methods of creating application interfaces. The main objective of the course are issues related to the discussion of the procedures and algorithms used in issues processing bitmap and object recognition.	
Assessment methods: Student's work during problem solving computer laboratories and written exam	
Recommended reading: 1. Head First Android Development: A Brain-Friendly Guide by Dawn Griffiths and David Griffiths, O'Reilly Media; 2015. 2. Learn Android Studio: Build Android Apps Quickly and Effectively by Adam Gerber, Apress; 2015. 3. Introduction to Android Application Development: Android Essentials by Joseph Annuzzi Jr., Lauren Darcey, Shane Conder, Addison-Wesley Professional; 2015	

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Course name: Renewable Energy Sources	
Course code: E041	Form of class: Lecture,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Radziewicz Wojciech, w.radziewicz@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge about the electric energy production. Basic knowledge of electrical industry.	
Objectives of the course and learning outcomes: The graduate has a detail knowledge about the methods of eclectic energy production coming from renewable sources. The graduate can estimate the economic efficiency of eclectic energy production coming from renewable sources.	
Teaching program: Introduction to renewable energy sources. Renewable and not renewable energy. Large wind power plants. Small wind power plants. Photovoltaic energy. Hydroelectric power plants. Bio gasworks. Efficiency of eclectic energy production.	
Assessment methods: Oral examination and project.	
Recommended reading: • Ackermann T.: Wind Power in Power Systems, Royal Institute of Technology, Stockholm 2005, • Danish Energy Agency: Energy 21: The Danish Government's Action Plan, DEA, • U.S. Department of Energy, International Energy Outlook 2003, Energy Information Administration, Washington DC, • RETScreen: Pre-feasibility Analysis Software, CANMET Energy Diversification Research Laboratory (CEDRL), Canada 2000.	

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Course name: Routing and Switching Essentials	
Course code: E042	Form of class: Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Gola Mariusz, m.gola@po.opole.pl	
Prerequisites: English (min B1 level), By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with RIPv1, RIPv2, single-area and multi-area OSPF, virtual LANs, and inter-VLAN routing in both IPv4 and IPv6 networks	
Objectives of the course and learning outcomes: Describes the architecture, components, and operations of routers and switches in a small network. Students learn how to configure a router and a switch for basic functionality Course describes: • enhanced switching technologies such as VLANs, VLAN Trunking Protocol, Rapid Spanning Tree Protocol, and 802.1q • basic switching concepts and the operation of Cisco switches • the operations of Dynamic Host Configuration Protocol and Domain Name System for IPv4 and IPv6 • configure and troubleshoot basic operations of a small switched network • configure and troubleshoot VLANs and inter-VLAN routing	
Teaching program: on-line tests	
Assessment methods: on-line tests	
Recommended reading: • Computer Networking: A Top-Down Approach (7th Edition), James Kurose, Keith Ross • Computer Networks (5th Edition), Andrew S. Tanenbaum, David J. Wetherall • Networking: A Beginner's Guide, Sixth Edition, Bruce Hallberg	

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Course name: Software Engineering	
Course code: E043	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 7	Start date: February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Paszkiel Szczepan, s.paszkiel@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of software engineering. Basic knowledge of UML.	
Objectives of the course and learning outcomes: The graduate has a knowledge about the differences between development methodology frameworks. The graduate knows Unified Modeling Language.	
Teaching program: 1.Business processes, information systems - the role of engineering software. 2.Requirements specification, analysis, modeling and design as the primary stages of construction systems. Life cycle models (the system) software. 3.Object modeling of business processes and information systems. 4.UML modeling language. 5.Software development tools. 6.Validation and testing of software. 7.Project management programming.	
Assessment methods: The assessment of the student's work will written examination and finished project. The project has to be ready by the end of the semester.	
Recommended reading: Tom Pender: UML Bible. John Wiley	

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Course name: Specialized Programming Languages	
Course code: E044	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kamiński Marcin, m.kaminski@po.opole.pl	
Prerequisites: English (min B1 level), Basic programming skills	
Objectives of the course and learning outcomes: Introductory level course of selected specialized programming languages leading to practical skills of their use	
Teaching program: Python programming language: types and operators, statements and syntax, functions, modules, text and binary files, databases, Python's support for regular expressions, graphical user interface(Tkinter), Python extensions: VPython, Numerical Python, etc. LaTeX – document preparation system: input files, layout of the document, typesetting text, international language support, environments, typesetting mathematical formulae, inserting graphics, presentation tools (beamer). ImageMagick – image processing environment: basic and advanced image transformations, using drawing commands, image conversions, batch processing	
Assessment methods: Student's work during problem solving computer laboratories and written exam	
Recommended reading: Mark Lutz: Learning Python, O'Reilly Media Inc., 2007 Leslie Lamport: LaTeX – A Document Preparation System, Addison-Wesley, 1994. Michael Still: The Definitive Guide to ImageMagick, Apress, 1005	

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Course name: Statistical Inference and Operational Research	
Course code: E045	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 7	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Paszkiel Szczepan, s.paszkiel@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of statistical. Basic knowledge of operational research.	
Objectives of the course and learning outcomes: The graduate has a knowledge about the statistic and optimization. The graduate knows operation research.	
Teaching program: 1.Statistical inference 2.Hypothesis Testing 3.Tests for the mean of a normal population, for the difference of means of two populations 4.Regression and Correlation 5.Simple Linear Regression 6.Correlation coefficient and determination 7.Hypothesis testing the parameters of the regression model 8.Operations research 9.Graphical resolution of linear programming problems 10.The method and dual simplex method 11.Methodology simplex and interpretation 12.Problems with artificial variables 13.The allocation algorithm	
Assessment methods: Presentation, coursework, project	
Recommended reading: Statistical Inference, G. Casella, R. L. Berger, 2001, Second Edition Operation Research, A. P. Verma, 2009, S.K. Kataria	

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Course name: Telecommunication networks and systems	
Course code: E046	Form of class: Lecture,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Radziewicz Wojciech, w.radziewicz@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of computer science	
Objectives of the course and learning outcomes: The graduate has a knowledge about the telecommunication networks and systems.	
Teaching program: Introduction to telecommunication networks and systems. Networks LAN and WAN. Core telecommunications networks. High Speed Digital Cable Access: xDSL, Cable Modems, FTTX. Wireless Access: WLAN, WiMAX, cellular systems, satellite systems. Multimedia Networks. Services and Applications.	
Assessment methods: The assessment of the student's work will occur on oral examination and finished project. The project has to be ready by the end of the semester.	
Recommended reading: • J. E. Flood: Telecommunication Networks 2nd Edition. The Institution of Electrical Engineers, London, UK, 1997, • T. Saadawi, M. Ammar.: Fundamentals of Telecommunication Networks. John Wiley	

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Course name: Introduction to Algorithm Design	
Course code: E047	Form of class: Lecture,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Paszkiel Szczepan, s.paszkiel@po.opole.pl	
Prerequisites: English (min B1 level), Basic English. Basic knowledge about algorithm.	
Objectives of the course and learning outcomes: The graduate has a knowledge about the algorithm design. The graduate can present the algorithm in many ways.	
Teaching program: 1. Introduction to algorithm design. Exercises in design flowcharts algorithms. Horner scheme. 2. The Euclidean algorithm. Recursion. Tower of Hanoi. Traveling salesman problem. Sieve of Eratosthenes. Fibonacci numbers. 3. Automata Design. Definition of regular languages using regular expressions. 4. Definition and design of regular grammars. 5. Theory of Algorithms. Study of the basic techniques of implementation of efficient algorithms. Divide and conquer algorithm. Greedy algorithm. 6. Sort stable and unstable, classification of sorts. 7. Algorithms for the Exploration of Graphs. 8. Fundamentals of cryptography, cipher Vernam, Shannon's theorem, RSA algorithm - key generation.	
Assessment methods: Presentation, coursework, oral test	
Recommended reading: Cormen T.H., Leiserson C.E., Rivest R.L., Introduction to Algorithms Aho, A. V., Hopcroft, J. E., Ullman, J. D., The Design and Analysis of Computer Algorithms Sedgewick R., Algorithms in C	

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Course name: System programming: Concurrent and Distributed Systems	
Course code: E048	Form of class: Lecture,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Paszkiel Szczepan, s.paszkiel@po.opole.pl	
Prerequisites: English (min B1 level), Basic English. Basic knowledge of programming.	
Objectives of the course and learning outcomes: The graduate has a knowledge about the system programming. The graduate can present concurrent and distributed systems.	
Teaching program: 1. Introduction to concurrent programming. 1.1. Basic concepts and motivation. 1.2. Mutual exclusion and synchronization. 1.3. Properties of concurrent systems. Check. 2. Synchronization in shared memory systems. 2.1. Basic algorithms of mutual exclusion in systems with shared memory. 2.2. Monitors as a high level mechanism. 3. Passing messages. 3.1. Basic mechanisms in systems based on message passing. 3.2. Models and languages of distributed programming. 3.3. High level mechanisms in distributed systems. 3.4. RPC and RMI. 4. Techniques for the design of real-time systems. 4.1. Real time system concept. Measures of time and task model. 4.2. Planning of periodic tasks with prioritization. 4.3. General and specific tasks models.	
Assessment methods: Presentation, coursework, oral test	
Recommended reading: Andrews, G. R., Foundations of Multithreaded, Parallel, and Distributed Programming, 2000 Aho, A. V., Hopcroft, J. E., Ullman, J. D., The Design and Analysis of Computer Algorithms Peleg D., Distributed Computing: A Locality-Sensitive Approach, 2000	

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Course name: Expert systems for automatic control	
Course code: E049	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Michalski Paweł, p.michalski@po.opole.pl Ruszczak Bogdan,	
Prerequisites: English (min B1 level), English (min B1 level)	
Objectives of the course and learning outcomes: The expert systems implementation presentation using machine vision and computer vision techniques to aid the automatic control	
Teaching program: The knowledge developed in this class try to teach one how to apply the theoretical knowledge to topics as image manipulation, object tracking, scene reconstruction, statistical techniques, machine learning and object categorization to the automatic control. It consists of: - Introduction. - Computer and machine vision. - Core Operations. - Image Processing in OpenCV. - Feature Detection and Description. - Video Analysis. - Machine Learning. - Object Detection.	
Assessment methods: individual project/coursework	
Recommended reading: - Beyeler Michael: OpenCV with Python Blueprints - Matsuyama Takashi: Expert Systems for Image Processing, Analysis, and Recognition: Declarative Knowledge Representation for Computer Vision - Howse Joseph: OpenCV Computer Vision with Python - Mordvintsev Alexander, Abid K.: OpenCV - Python Tutorials Documentation	

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Course name: Mechanics	
Course code: M001	Form of class: Lecture, Group tutorial, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kowalski Mateusz, m.kowalski@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Information to be provided by the lecturer	
Teaching program: Teaching program includes a basic knowledge of analytical mechanics: statics, kinematics and dynamics of the particle and particle system. Equilibrium of plane and spatial systems (determination of unknown support quantities. Static analysis of beams, pillars, frames and frameworks. Kinematics and foundations of rigid body dynamics. Resultant motion. Coriolis acceleration. Typical case studies i.e. : loaded beams, bars, sections, plates and systems. Real-world applications include basic properties of engineering constructions will be discussed.	
Assessment methods: Test, calculations, coursework	
Recommended reading: 1.Bogdan Skalmierski: Mechanics, Warszawa ; Amsterdam, Elsevier, 1992. 2.W. L. Cleghorn: Mechanics of Machines, New York: Oxford University Press, 2005. 3.Roger T. Fenner: Mechanics of Solids, Oxford, Blackwell Scientific Publ., 1989.	

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Course name: Machine Design	
Course code: M002	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 4	Number of hours per semester: 60
Language of instruction: English	
Name of the lecturer and contact information: Owsiński Robert, r.owsinski@po.opole.pl	
Prerequisites: English (min B1 level), Mechanics, strength of materials, graphics	
Objectives of the course and learning outcomes: Information to be provided by the lecturer	
Teaching program: Theory of machines – some chosen problems. Fundamentals of structure theory. Fundamentals of fatigue strength and fatigue calculations. Elements of tribology. Joints. Pipelines and valves. Flexible elements. Shafts and axles. Couplings. Brakes. Mechanical transmissions. Operation and reliability of machine and devices. Algorithms of designing. Fundamentals of optimization. Simulation of mechanical systems in machine building – digital simulation. Engineering data bases. Advanced methods of computer-aided designing (CAD).	
Assessment methods: Project	
Recommended reading: 1. J.K. Gupta, R.S. Khurmi; Machine Design 2. R.S. Khurmi; Theory of Machines 3. A. D. Deutschman, W. J. Michels, C. E. Wilson; Machine Design; Theory and Practice	

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Course name: Machine Life	
Course code: M003	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kurek Andrzej, a.kurek@po.opole.pl Kurek Marta, ma.kurek@po.opole.pl	
Prerequisites: English (min B1 level), Knowledge of mechanics, strength of materials	
Objectives of the course and learning outcomes: Student will have a detailed knowledge of the fatigue of materials and exploitation of machines and constructions. Student will be able to assess the consequences of failure in the operation process.	
Teaching program: Determination of standard fatigue characteristics. Determination of the cyclic strain curve and its modelling with the Ramberg-Osgood equation. Investigations of notch influence on fatigue life of elements under simple loadings. Schematization of random histories of service loadings, damage accumulation and fatigue life calculations. Determination of fatigue life of welded joints under simple loadings. Simulation of service loadings with the computer generator of random signals. Determination of fatigue life under constant-amplitude and random loadings with mean stresses. Fatigue life of materials under constant-amplitude bending and torsion with phase displacement. Investigations of notch influence on fatigue life under complex loadings. Investigations of influence of correlation between stress state components on fatigue life. Determination of fatigue life of welded joints taking into account the fictitious notch radius. Determination of the expected position of the fatigue fracture plane with the damage accumulation method. Determination of fatigue life with the spectral method. Fatigue tests under polyharmonic loadings.	
Assessment methods: Individual project paper report and presentation	
Recommended reading: 1. Carl C. Osgood: Fatigue Design / Carl C. Osgood. - Ed.2. - Oxford [i in.] : Pergamon Press, 1982. - IX, 606 s. (International Series on the Strength and Fracture of Materials and Structures. Pergamon International Library of Science, Technology, Engineering and Social Studies) 2. Darrell F. Socie, Gary B. Marquis: Warrendale Multiaxial Fatigue: Society of Automotive Engineers, 2000. 3. Vladimir V. Bolotin: Mechanics of Fatigue, New York , CRC Press, 1999.	

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Course name: Materials science	
Course code: M004	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Andrzejewski Dariusz, d.andrzejewski@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge about materials and structures used in Mechanical Engineering	
Objectives of the course and learning outcomes: The basic mechanical and technical properties of metals, amorphous materials, synthetics materials. Methods for proper bonding materials and choice of materials depending on the application	
Teaching program: 1. The structure and properties selected steels. 2. The structure and properties cast iron. 3. The structure and properties alloys aluminium. 4. The structure and properties alloys copper. 5. The effect of alloying elements on the properties of metals. 6. Transformation in the structure during heating and cooling. 7. Corrosion of materials. 8. The structure and properties composite materials. 9. Different methods of joining materials. 10. Explosion welding. 11. Materials and method of operation and comparison of solar electric and liquid solar panels. 12. Shadow coefficient construction. 13. Geothermal heating and the materials used to construction. 14. Termoisation used in engineering barrier. 15. Free energy it is possible?	
Assessment methods: Thematic presentation, active participation in laboratory classes	
Recommended reading: 1. William D. Callister, David G. Rethwisch: Material Science and Engineering, Publisher: Wiley; 9 edition (December 4, 2013) 2. William D. Callister, David G. Rethwisch: An Introduction, Publisher: Wiley, 2010 3. George Stuart Brady, Henry R. Clauser, John A. Vaccari: Materials Handbook, Publisher: McGraw-Hill Education; 15th edition (July 9, 2002) 4. Michael F. Ashby, David R H Jones: Engineering Materials Volume 1, Publisher: Butterworth-Heinemann Ltd; 2nd Revised edition (1 Oct. 1996) 5. John Martin: Materials for Engineering, Publisher: CRC Press; 3 edition (July 7, 2006)	

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Course name: Strength of Materials	
Course code: M005	Form of class: Lecture, Group tutorial, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Bohm Michał, m.bohm@po.opole.pl	
Prerequisites: English (min B1 level), Knowledge of mechanics	
Objectives of the course and learning outcomes: Information to be provided by the lecturer	
Teaching program: State of stresses and shifts of beams and bars. Kinematics and foundations of rigid body dynamics. Permissible stresses. Limiting load capacity and relations between the stress and strain states. Strength hypotheses. Analysis of strength of machine elements. Linear-elastic systems. Loss of stability of bar systems. Strength analysis of thin-walled plates and shells.	
Assessment methods: Test, calculations and experiment	
Recommended reading: 1.B. Skalmierski: Mechanics and strength of materials, Elsevier New York, 1979 2.T.Kobayashi: Strength and Toughness of Materials, Springer Verlag, Japan 2004 3.V. D. Silva: Mechanics and Strength of Materials, Springer Verlag. Berlin- Heidelberg 2006	

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Course name: Mechanics Elements and Machines Design	
Course code: M006	Form of class: Lecture, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Owsiński Robert, r.owsinski@po.opole.pl	
Prerequisites: English (min B1 level),	
Objectives of the course and learning outcomes: information to be provided by the lecturer	
Teaching program: Mechanics of elements. Theory of machines – some chosen problems. Machines' design. Fundamentals of structure theory. Fundamentals of fatigue strength and fatigue calculations. Elements of tribology. Joints. Pipelines and valves. Flexible elements. Shafts and axles. Couplings. Brakes. Mechanical transmissions. Operation and reliability of machine and devices. Algorithms of designing. Fundamentals of optimization. Simulation of mechanical systems in machine building – digital simulation. Engineering data bases. Advanced methods of computer-aided designing (CAD).	
Assessment methods: Project	
Recommended reading: 1.J.K. Gupta, R.S. Khurmi; Machine Design 2.R.S. Khurmi; Theory of Machines 3.J.E. Shigley, C. R. Mischke; Standard Handbook of Machine Design	

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Course name: Structural Mechanics in Machine Design	
Course code: M007	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kowalski Mateusz, m.kowalski@po.opole.pl	
Prerequisites: English (min B1 level), Basic of mathematics (high school level)	
Objectives of the course and learning outcomes: This course focuses on the fundamentals of structure and designing and bonding that underpin materials science. It is the introductory lecture class for students interesting in Materials Science and Engineering.	
Teaching program: Models of materials; materials phenomena, such as creep, relaxation, and fatigue; geometry of the motion and/or deformation of the structure, and conditions of geometric fit, forces on and within structures and assemblages; physical aspects of the structural system (including material properties) which quantify relations between the forces and motions/deformation. Typical case studies: loaded beams, bars, sections, plates and systems. Real-world applications include engineered alloys will be discussed; materials used in modern designing, typical structures and loading conditions, typical machine parts, strength of components. - other themes prepared by lecturer	
Assessment methods: Written work, active participation in laboratory classes, project	
Recommended reading: 1.Hjelmstad K.D.: Fundamentals of Structural Mechanics, Springer Science 2005. 2.Sundararajan C.: Probabilistic Structural Mechanics Handbook : Theory and Industrial Applicationa ,ed. C. Sundararajan. - New York [i in.] : Chapman	

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Course name: Simulation in Machine Dynamics	
Course code: M008	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October
Number of hours per week: 3	Number of hours per semester: 45
Language of instruction: English	
Name of the lecturer and contact information: Owsinski Robert, r.owsinski@po.opole.pl	
Prerequisites: English (min B1 level), Mathematical analysis, analytical mechanics, theory of vibrations fundamentals	
Objectives of the course and learning outcomes: Mathematical modeling and computer simulation of linear and nonlinear mechanical systems with one and more degrees of freedom using Matlab-Simulink programme	
Teaching program: - Introduction to Matlab-Simulink programme, numerical methods in Matlab, - Differential equations modeling methods using Simulink programme, - Simulation and modeling of linear mechanical systems using general and operational methods, - Simulation and modeling of nonlinear mechanical systems using general method, - Transfer function concept for linear mechanical systems with one and more degrees of freedom, frequency characteristics of the linear systems, - Application of FFT or DFT functions for frequency characteristics determination of the nonlinear mechanical systems, - Movement stability analysis for linear and nonlinear mechanical systems	
Assessment methods: reports written by students	
Recommended reading: a) B. Skalmierski, Mechanics, Warszawa-Amsterdam, PWN-Elsevier 1992. b) J. L. Meriam, L. G. Kraige, Engineering Mechanics, vol. 2 Dynamics, 3rd ed. - New York: John Wiley	

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Course name: Steel Structures	
Course code: M009	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kurek Andrzej, a.kurek@po.opole.pl	
Prerequisites: English (min B1 level), Knowledge of mathematics, mechanics and strength of materials	
Objectives of the course and learning outcomes: After this course students will be familiar with the subject of steel structures. The students will have an understanding of the behavior of steel elements under structural loading. Will be able to design primary steel structural elements of a building and their connections.	
Teaching program: Introduction, Material Properties, Design Process. Tension Members: strength, failure modes, design. Compression Members: critical strength, compactness. Compression Members: effective length and design. Beam: Section analysis and flexural strength. Beam: Shear strength and serviceability. Design of Beams; Beam-Column Interaction. Project of a steel structure.	
Assessment methods: Individual project paper report	
Recommended reading: 1.Piotr Iwicki: Selected problems of stability of steel structures,Gdańsk, Wydawnictwo Politechniki Gdańskiej, 2010. 2.Rolf Kindmann, Matthias Kraus: Steel structures: design using FEM, Berlin, Wilhelm Ernst	

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Course name: Structural Design	
Course code: M010	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kurek Andrzej, a.kurek@po.opole.pl	
Prerequisites: English (min B1 level), Knowledge of mathematics, mechanics and strength of materials	
Objectives of the course and learning outcomes: The main objective of this course is to teach students the basic knowledge of structural analysis and design for buildings, bridges and other structures and its practical application.	
Teaching program: The teaching program contains steps like: •Introduction. •Compression and tension structures. •Designing for axial forces. •Forces and forms in beams. •Beam design. •Structural failures. •Loadings. •Timber design. •Steel design. These classes are focused on structural design of basic constructions. Mostly focusing on uni-axial and multi-axial forces. Finite Element Method (FEM) software used for modeling and more. FEM allows detailed visualization of where structures bend or twist, and indicates the distribution of stresses and displacements	
Assessment methods: Individual project, paper report	
Recommended reading: 1.Samuel H. Marcus: Basics of Structural Steel Design, Reston Publ. Comp., Prentice-Hall, 1977. 2.Klaus-Jürgen Bathe: Finite Element Procedures in Engineering Analysis, Prentice-Hall, 1982. 3.Myer Kutz: Mechanical engineers' handbook, New York, John Wiley	

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Course name: Welding	
Course code: M011	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Blacha Łukasz, l.blacha@po.opole.pl	
Prerequisites: English (min B1 level), Strength of materials	
Objectives of the course and learning outcomes: The course consists of individual work (project) aimed at the design of typical welded joints that will undergo a certain number of work cycles (i.e. acceptably immune to fatigue damage).	
Teaching program: At the beginning of the course, the ways of standardized fatigue assessment of welded joints are introduced. Following, the calculation methods and algorithms are presented and practically applied. Based on the material presented and individually reviewed, each student is obliged to write a project concerning determination of number of load cycles to failure. Specifically, the course is organized over five blocks: 1) Basic lifetime prediction methods 2) Recommendations and guides regarding typical fatigue calculations 3) Calculation schemes 4) Individual work 5) Assessment / grades	
Assessment methods: Final grade will depend from the quality of the written individual project.	
Recommended reading: 1) Hobbacher A.: Recommendations for fatigue design of welded joint and components. International Institute of Welding, IIW document XIII-2151r4-07/XV-1254r4-07, Paris, 2008. 2) EN 1993-1-9 (2005) (English): Eurocode 3: Design of steel structures - Part 1-9: Fatigue. 3) EN 1999-1-3 (2007) (English): Eurocode 9: Design of aluminium structures - Part 1-3: Structures susceptible to fatigue. 4) American Bureau of Shipping (ABS): Guide for fatigue assessment of offshore structures. ABS, Houston, 2003.	

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Course name: Hydraulic Machines	
Course code: M012	Form of class: Lecture, Group tutorial, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 3	Number of hours per semester: 45
Language of instruction: English	
Name of the lecturer and contact information: Borsuk Grzegorz, g.borsuk@po.opole.pl Wydrych Jacek, j.wydrych@po.opole.pl	
Prerequisites: English (min B1 level), Mathematics, Measurement and Instrumentation.	
Objectives of the course and learning outcomes: This course introduces the working principles of fluid machines such as pumps and turbines. It's aimed at developing an understanding, from a fluid-mechanics and thermodynamics point of view, how these devices work, performs and can be regulated.	
Teaching program: Introduction to the hydraulic machines. Hydraulic machines types: Turbines and pumps. Fundamentals of turbomachine theory: momentum principle applied to flow through a rotor; thrust on the rotor; torque exerted on the rotor; Euler equation for turbomachines; velocity triangles. Axial reaction turbines. Centrifugal pumps: impeller vanes design; diffuser design. Dimensionless parameters and similarity laws applied to the design.	
Assessment methods: Exam (test)	
Recommended reading: 1.R. Singal, M. Singal, R. Singal: Hydraulic Machines: Fluid Machinery, I.K. International PVT Ltd, 2009 2.R. Bansal: Fluid Mechanics and Hydraulic Machines, Laxmi Publications, 2010 3.Z. Hussian, Z. Abdullah, Z. Alimuddin: Basic Fluid Mechanics and Hydraulic Machines, CRC Press, 2009	

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Course name: Fluid Mechanics	
Course code: M013	Form of class: Lecture, Group tutorial, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 4	Number of hours per semester: 60
Language of instruction: English	
Name of the lecturer and contact information: Borsuk Grzegorz, g.borsuk@po.opole.pl Spyra Andrzej, a.spyra@po.opole.pl Wydrych Jacek, j.wydrych@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Main objective of the course is to give the students a strong background in fundamental laws of physics applicable in fluid mechanics, applications of fluid mechanics and current measurement techniques.	
Teaching program: Lectures/group tutorial Introduction - Fluid Statics - Conservation of mass and momentum - Bernoulli equation - Equations of motion in integral form - Equations of motion in differential form - Kinematics, vorticity, potential flow - Potential flow - Dimensional analysis - Viscous flows, exact solutions, pipe flow - Laminar boundary layers - Boundary layer solution methods - Turbulence - Turbulent internal and external flows Laboratory Flow Measurements and Calibration of Flow Meters - Reynolds Experiment and Estimation of the Critical Reynolds Number - Unsteady Flow Through an Orifice - Potential Flow - Determination of Energy	
Assessment methods: Exam (test).	
Recommended reading: 1.Gerhart P.M. Fundamentals of Fluid Mechanics, Addison-Wesley Publishing Company, New York 1992 2.R. Bansal: Fluid Mechanics and Hydraulic Machines, Laxmi Publications, 2010 3.Z. Hussian, Z. Abdullah, Z. Alimuddin: Basic Fluid Mechanics and Hydraulic Machines, CRC Press, 2009	

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Course name: Technology of manufacturing	
Course code: M014	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Żak Krzysztof, k.zak@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Main objective of the course is to give the students a strong background in technology especially in the area of machining processes and globally manufacturing of machine pieces.	
Teaching program: - Casting, Forming - Sheet Metal Processing - Basic information of Cutting Process - Cutting Process Models and Analysis, - Process Planning, - Joining, - Surface Treatment - Non-traditional processes - Micro- and nano-manufacturing.	
Assessment methods: Project, individual consultations	
Recommended reading: 1.Wit Grzesik: Advanced Machining Processes of Metallic Materials 2nd Edition, Elsevier, 2017 2.Mikell P. Groover: Principles of Modern Manufacturing, John Wiley	

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Course name: Engineering Vibration Analysis of Mechanical Systems	
Course code: M015	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English, German	
Name of the lecturer and contact information: Bohm Michał, m.bohm@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of mechanics. English or German.	
Objectives of the course and learning outcomes: The course is intended to give students a first degree level in understanding the principles and techniques involved in the analysis of vibrations and how they can also be applied to the analysis of mechanical systems dynamics.	
Teaching program: •Introduction to vibration analysis. •Vibration of mechanical systems with one degree of freedom. •Harmonic analysis, random vibrations, shock excitation. •Vibration of mechanical systems with more than one degree of freedom. •Mechanical systems with disturbed mass and elasticity. •Mechatronic vibration control systems.	
Assessment methods: Individual tasks to be calculated by the students, reports.	
Recommended reading: 1.J. Solnes: Stochastic processes and random vibrations theory and practice. John Wiley and Sons, West Sussex 1997 2.R.N. Jazar: Vibrations of thick cylindrical structures. Springer Verlag. New York 2010 3.V.A. Svetlitsky: Engineering vibration analysis. Springer Verlag. Berlin- Heidelberg 2004	

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Course name: Measurement Method in Mechanical Engineering	
Course code: M016	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Rzasa Mariusz, m.rzasa@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Presentation of the basic subject of experiments in a mechanical area. Typical measurements methods. Use the typical instrument and system design.	
Teaching program: Acquiring and acquisition of data using a computer measuring devices. The nature of engineering experiments. Method of measurement a typical mechanical quantities. Typical instrument and system design. Test data checking and rejection and Statistical data analysis. Graphical presentation of data results.	
Assessment methods: Points for the students' activity during classes. The laboratory classes for small groups of people should help the students in being experienced in proper application of the devices for electric measurements. Active work of the students during the classes. laboratory reports	
Recommended reading: 1.Adam Barylski, Janusz T. Cieśliński: Developments in Mechanical Engineering, Gdańsk University of Technology Publishers, 2005. 2.Jerome F. Mueller et al.: Standard Application of Mechanical Details, McGraw-Hill Book Co., New York 1985.	

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Course name: Computer Measurement Systems	
Course code: M017	Form of class: Lecture, Laboratory, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Rzasa Mariusz, m.rzasa@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Presentation of the basic notions and elements of the computer measuring systems. Typical DAQ and SCDA systems. Typical programming environments of computer measuring systems.	
Teaching program: Acquiring and acquisition of data using measuring cards DAQ. Simple handling of data, spectral analysis FFT, program calibration of sensors. Designing and programming of virtual measuring devices. Programming of simple-programmable devices PLC and configuration of cooperation of these devices with the system of visualization and measurement. Computer algorithms of data processing and their application in measuring systems.	
Assessment methods: Points for the students' activity during classes. The laboratory classes for small groups of people should help the students in being experienced in proper application of the devices for electric measurements. Active work of the students during the classes. laboratory report/ group project paper report and/or presentation	
Recommended reading: 1. Vibration measurement / Gheorghe Buzdugan, Elena Mihailescu, Mircea Rades. - Dordrecht [i in.] : Martinus Nijhoff Publ., 1986. 2. Measurement and instrumentation : theory and application / Alan S. Morris, Reza Langari. - Amsterdam [etc.] : Elsevier, cop. 2012.. 3. The measurement, instrumentation, and sensors handbook / editor-in-chief, John G. Webster. - Boca Raton, FL : CRC Press published in cooperation with IEEE Press, cop. 1999.	

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Course name: Computer Aided Design	
Course available with minimum number of 4 participants.	
Course code: M018	Form of class: Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Pawliczek Roland, r.pawliczek@po.opole.pl	
Prerequisites: English (min B1 level), Fundamentals of informatics and descriptive geometry.	
Objectives of the course and learning outcomes: The objective of the CAD course is to make students familiar with professional program systems concerning designing of 3d models, analysis of the geometry of the object, generation of documents. Learning outcomes: student can use computer-aided design systems, use the tools for structural analysis and generate design documentation.	
Teaching program: CAD Graphic Environment CATIA: introduction to 3D modeling systems, types of documents. Basic components of user interface. Environment configuration. Object manipulation tools. Using sketches, profiles. Basic of geometry creation. Correlated dimensions. Geometrical constraints. Basic functions of 3D-solid creation: sketch based features (extraction of a profile, rotation about an axis). Model edition and modification. Assembly constraints and assembly analysis. Generation of technical documentation: views and projections, sections, details and other technics. Dimensioning and annotations.	
Assessment methods: Individual project	
Recommended reading: 1. Kirstie Plantenberg, Introduction to CATIA V5 Release 19, 2. Schroff Development Corporation (August 12, 2009) 3. http://blog.caddsoftsolutions.com/2011/09/catia-v5-basic-tutorial-pdf-free.html 4. CATIA help files	

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Course name: Auto CAD basics	
Course code: M019	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Królczyk Grzegorz, g.krolczyk@po.opole.pl	
Prerequisites: English (min B1 level), Engineering Graphics	
Objectives of the course and learning outcomes: To acquaint students with computer aided design and manufacturing in context of modern methods of production.	
Teaching program: In the competitive business arena companies must continually strive to create new and better products faster, more efficiently, and more cost effectively than their competitors to gain and keep the competitive advantage. Computer-aided design (CAD) software, are now the industry standard. Computer Aided Design, explores how the use of internets and intranets in the manufacturing process allows a total enterprise approach to manufacturing. Explains how computer aided process planning results in highly cost effective manufacturing. Covers techniques in computer assembly that automate the product integration process. Presents techniques that are applicable to any manufacturing process.	
Assessment methods: Project: solution of chosen problem (description of the problem and computer program).	
Recommended reading: 1. Course notes, 2. Ghassan Aouad, Angela Lee, Song Wu, Timothy Onyenobi. Computer Aided Design Guide for Architecture, Engineering and Construction. SPON Press, 2012 3. Cornelius T. Leondes. Computer-Aided Design, Engineering, and Manufacturing: Systems Techniques and Applications, Volume III, Operational Methods in Computer-Aided Design. CRC Press 2000.	

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Course name: Advanced CAD/CAE design	
Course code: M020	Form of class: Laboratory,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Mrzygłód Mirosław, m.mrzyglod@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Extend practical skills and knowledge related to selected problems of design with application of modern CAD/CAE tools.	
Teaching program: The course includes among other things: advanced 3D solid modelling and design parameterization, 3D surface design with application of reverse engineering, sheet metal design (SMD), structural finite element analysis (FEA), introduction to continuous fluid dynamics analysis (CFD), fluid- structure interaction (FSI) analysis, introduction to explicit dynamics (impacts) analysis.	
Assessment methods: Hands on training with application of industrial examples.	
Recommended reading: 1.T. Stolarski, Y. Nakasone, S. Yoshimoto, Engineering Analysis with ANSYS Software, Butterworth-Heinemann, 2007 2.S. Moaveni, Finite Element Analysis: Theory and Application with ANSYS, Prentice-Hall, 1999 3.Dassault Systemes, CATIA Version 5 Release 20 User's Documentation, 2009.	

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Course name: Dynamics of the vehicle	
Course code: M021	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Brol Sebastian, s.brol@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level), Physics	
Objectives of the course and learning outcomes: Gaining skills in: application of vehicle force balance for steady, accelerated and decelerated movement; modeling of vehicle dynamics; drag forces modeling; driving forces modeling; vehicle movement analysis and; vehicle powertrain and body designing.	
Teaching program: Balance of the forces, driving forces, drag forces: grade, towing, rolling, aerodynamic, inertial, modeling of vehicle movement in steady state, in acceleration phase, deceleration phase, solving differential equations in order to achieve power, driving force, acceleration, distance in time charts, designing of selected vehicle parameters such as driving force course, aerodynamic properties, rolling drag. Testing of vehicles: on road tests, dynamometer tests, GPS, Power Acceleration And Force device aided tests.	
Assessment methods: Final report	
Recommended reading: Miliken and Miliken: Race Car Vehicle Dynamics Wolf-Heinrich Hucho: Aerodynamics of Road Vehicles Genta: Motor vehicle dynamics	

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Course name: Programming in MATLAB	
Course code: M022	Form of class: Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Karolczuk Aleksander, a.karolczuk@po.opole.pl	
Prerequisites: English (min B1 level), Basic mathematics: matrix algebra	
Objectives of the course and learning outcomes: Gaining the basic skill in programming using Matlab software.	
Teaching program: 1) Introduction to Matlab: What is Matlab, Matlab desktop. 2) Array and matrix operations: matrix, basic matrix manipulation, dimensions of matrix, subscripts, colon operator. 3) Variables and numbers: data types, numbers and formats, data search in matrix, relational and logical operations. 4) Basic plotting functions. 5) Programming in MATLAB: m-files, scripts and functions, loops, conditional statements. 6) More advance programming in MATLAB: multiple plot objects, 3D plots .7) Images, animation and applications.	
Assessment methods: Test paper examination	
Recommended reading: 1.Graeme Chandler, Introduction to Matlab, Mathematics Department, The University of Queensland, 2000, http://pfister.ee.duke.edu/courses/ecen455/IntroMatlab_GC.pdf 2.David F. Griffiths, An Introduction to Matlab, Department of Mathematics, The University Dundee, 2015, http://www.maths.dundee.ac.uk/software/MatlabNotes.pdf 3.David Houcque, Northwestern University, 2005, Introduction to Matlab for engineering students, file:///C:/Users/Alek/Downloads/introduction-to-matlab.pdf	

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Course name: Computer aided programming of the CNC machine tools	
Course available with minimum number of 4 participants.	
Course code: M023	Form of class: Lecture, Laboratory, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Bartoszuk Marian, m.bartoszuk@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge about the machine tools, cutting tools, properties of workpiece and cutting materials, manufacturing processes	
Objectives of the course and learning outcomes: Preparation a control program for CNC machine tools based on the CAM software (for example Mastercam , Inventor CAM , GTJ, etc.)	
Teaching program: Theory of CNC machine tools. Type of machine tools and machining centres. Type of control systems. Type of CAM software s. Postprocessors. Methods of programming of CNC machine tools. Programming by using simulation softwares. Programming by using modern CAM software.	
Assessment methods: Practical classes assessment and individual project paper report	
Recommended reading: 1.SmId P.: CNC Programming Handbook, Industrial Press Inc., New York 2003. 2.Overby A.: CNC Machining Handbook: Building, Programming, and Implementation, Mcgraw-hill, 2010. 3.Crandell T.: CNC Machining and Programming: An Introduction, Industrial Press Inc., 2003. 4.Evans K.: Programming of CNC Machines Student Workbook, Industrial Pr, 2007.	

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Course name: Information Technology (IT) in Engineering	
Course code: M024	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kurek Andrzej, a.kurek@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge in programming, basic knowledge in computer aided design.	
Objectives of the course and learning outcomes: Upon completing the course, the students will be able to deal with real-life IT problems occurring in designer work.	
Teaching program: This classes are focused on basic programming problems. Teaching programming in common languages used in engineering and science. Mostly on the example of MatLab and SciLab programs to do vast range of calculations and results plotting. Another part is the use of information technology in engineering and common IT problems in engineering. The curse program contains solving engineering and scientific problems. The matrix-based languages are the world's most natural way to express computational mathematics. Built-in graphics make it easy to visualize and gain insights from data. Common IT problems in engineering	
Assessment methods: Report, individual project paper raport	
Recommended reading: 1.Getting Started with MATLAB, version 6, The MathWorks (avaible online) 2.Peter I. Kattan: Matlab Guide to Finite Elements: an Interactive Approach, 2 ed. - Berlin Springer - Verlag, cop. 2007. 3.http://www.scilab.org/content/download/247/1702/file/introscilab.pdf	

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Course name: Graphical programming in mechatronic systems	
Course code: M025	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Pawliczek Roland, r.pawliczek@po.opole.pl	
Prerequisites: English (min B1 level), Basic of informatics technology.	
Objectives of the course and learning outcomes: The aim of the course is to familiarize students with professional programming systems concerning the use of the idea of virtual instrument for solving problems generally understood mechatronic systems and control systems. Learning outcomes: student can build a simple measuring and control systems and create a program for the acquisition, processing and analysis of measurement data; student is able to handle systems of computer-aided design and analysis of operation of mechatronic systems.	
Teaching program: The idea of virtual instruments – LabVIEW environment for graphical programing. LabVIEW user interface. Basic of graphical programming: front panel, data types, controls and indicators ,functions, structures. Basic of data analysis. Measurement systems: data acquisition, analogue-digital conversion. Measurement problems: aliasing, spectrum leakage, filtering. Simulation module: differential equations, Laplace transform, transfer function, state vector, output vector. Control design module: modeling of the proportional, first and second order systems. Model interconnections. Structure of the control system. System response, characteristics. PID control system. Analysis of the stability of the system.	
Assessment methods: Coursework, individual project report.	
Recommended reading: 1. NI LabVIEW User Manual, www.ni.com 2.Ronald W. Larsen, LabVIEW for Engineers, Prentice Hall, 2011 3.LabVIEW help files	

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Course name: Electrical Engineering and Electronics	
Course code: M026	Form of class: Lecture, Laboratory, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English, German	
Name of the lecturer and contact information: Rzasa Mariusz, m.rzasa@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Presentation of basic notions, elements and systems applied in electrical engineering and electronics, skill in recognition of typical connection systems, making simple electric systems.	
Teaching program: Measurements of basic electric quantities and determination of measurement uncertainty. Students learn principles of operation and service of basic devices for electric measurements. Determination of frequency characteristics of typical circuits for alternating currents including RC LC and RL, determination of resonance frequency of LC. Start of simple control systems including relays. Students learn how to read simple electric schemes and how to connect electric circuits. Investigations on rectifier systems – connection of typical rectifier systems and tests of their action and measurements in characteristic points of electronic circuits.	
Assessment methods: Active work of the students on the topics of the classes. Points for the students activity during the classes. Laboratory classes for small groups of people allow to obtain better results of teaching. Laboratory report/Group project paper report and/or presentation.	
Recommended reading: 1.Basic Electrical Engineering : Laboratory and Tutorial Procedures / Zenon Jan Pudlowski. - Sydney : EEERG : University of Sydney, 1991. 2.Electrical engineering experiments : theory and practice / by Henry R. Reed and George F. Corcoran. New York: John Wiley	

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Course name: Combustion engines	
Course code: M027	Form of class: Lecture, Laboratory, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 4	Number of hours per semester: 60
Language of instruction: English	
Name of the lecturer and contact information: Hetmańczyk Ireneusz, i.hetmanczyk@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge about combustion engine (building, steering, diagnostic, exploitation)	
Objectives of the course and learning outcomes: The basic technical properties of building combustion engine. Basic knowledge about materials and structures combustion engine. Improvement in the energy balance of combustion engines. Reduction of emission of harmful substances.	
Teaching program: - History of IC engines, two stroke and four stroke engines principle of operations. - Stroke ignition and compression ignition engines, external combustion engines, gas turbine. - Definitions and theoretical relations regarding for performance of IC engines. - Engine testing, methods of measuring experimental parameters in IC labs, (such as, tower, speed, air flow rate, Torque, fuel flow rate, pressure, Temperature, cycle pressure and volume, contraptions of CO₂, CO, NO_x, O₂, NO and NO₂ in the exhaust gas) and principles of measurements. - Heat transfer from in- cylinder contents to surrounding surface of the engine, principles and theoretical calculations. - Air standard cycle, air cycle, Otto- fuel cycle, Otto, Diesel and dual cycle. - Real cycles, ignition timing, injection timing, valve timing. - Super charge and turbo charging. - Fuels, alternative fuels, combustion, laminar and turbulent flame speeds. - Knock, octane no. and cetane no. - Fuel metering, carburetor and injection system, theoretical relations. - Ignition system, centrifugal and vacuum advances, principle of operations. - Friction and lubrication in IC engines. - Rotary (Wankel) engines their operations, advantages and disadvantages. - Homogeneous charge compression ignition engines, their operation, advantage and disadvantages. - Hybrid engines, different state of operation.	
Assessment methods: Laboratory reports, presentations	
Recommended reading: Combustion engines, Scientific Magazine, PL ISSN 0138-0346	

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Course name: Informatics	
Course code: M028	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 4	Number of hours per semester: 60
Language of instruction: English	
Name of the lecturer and contact information: Spyra Andrzej, a.spyra@po.opole.pl Wydrych Jacek, j.wydrych@po.opole.pl	
Prerequisites: English (min B1 level), Working with computer	
Objectives of the course and learning outcomes: Upon completing the course, the students will be able to deal with real-life programming problems. The course will introduce programming concepts and many examples to explain the theoretical material, and includes many suggestions for practical use of the chosen programming language.	
Teaching program: 1.Introduction, The History of Computing, Data Storage and Manipulation, Operating Systems 2.Algorithms: The Concept of an Algorithm, Algorithm Representation, Algorithm Discovery, Iterative Structures, Recursive Structures, Efficiency and Correctness 3.Programming Languages: Historical Perspective, Traditional Programming Concepts, Procedural Units, Language Implementation, Object-Oriented Programming 4.Review of the chosen programming language (C , VBA, Python): Environment, Syntax, Data Types, Variables, Keywords, Operators, Decision, Loops, Numbers, Characters, Arrays, Strings, Functions and/or Procedures, File I/O 5.Programming examples	
Assessment methods: Individual project report, computer-based problem solving work, written test	
Recommended reading: 1.Brookshear, J. Glenn, Brylow D., Computer Science: An Overview. 12th Ed., Pearson, 2014 2.Wirth N., Algorithms Data Structures = Programs. Prentice Hall, 1978 3.Chapra S. C. Introduction to VBA for Excel. 2nd Ed., Pearson, 2009 4.Malik D.S., C Programming: From Problem Analysis to Program Design, 7th Ed., Cengage Learning, 2014 5.Materials prepared by lecturer.	

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Course name: Building Structures	
Course code: M029	Form of class: Lecture, Group tutorial, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 5	Number of hours per semester: 75
Language of instruction: English	
Name of the lecturer and contact information: Kurek Andrzej, a.kurek@po.opole.pl	
Prerequisites: English (min B1 level), Knowledge of mathematics, mechanics and strength of materials	
Objectives of the course and learning outcomes: Student has knowledge of basic design elements engineering. Student is able to design the basic elements of mechanical engineering	
Teaching program: Some materials applied in building industry. General rules of building engineering. Elements of buildings, basic terms, kinds and aims: foundation trenches and foundations, walls and floors, roofs and draining of water, water, sewage and gas installations, stairs and communication systems. Loading of building structures. Connections of building structures. Constructional system and stiffness of the building. Building baffles and their requirements. Ventilation and combustion ducts. Constructions made of bricks, reinforced concrete, steel and wood. Technical specifications of building utilization.	
Assessment methods: Individual project paper report, test, presentations, laboratory	
Recommended reading: 1.Stanisław Fic: Building structures in theory and practice: Wydawnictwo Państwowej Szkoły Wyższej im. Papieża Jana Pawła II, 2013. 2.Tomasz Błaszczyński: Durability and repair of building structures Wrocław : Dolnośląskie Wydawnictwo Edukacyjne, 2010. 3.Wolfgang Schueller: High-Rise Building Structures, John Wiley	

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Course name: Technology, economy and organisation of building site	
Course code: M030	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kurek Andrzej, a.kurek@po.opole.pl	
Prerequisites: English (min B1 level), Knowledge of mathematics, mechanics and building structures.	
Objectives of the course and learning outcomes: Students get acquainted the main issues connected with managing a building site.	
Teaching program: Teaching program contains of steps: •Starting a construction investment, basic knowledge. •Regulations on health and safety on a building site. •Different technologies, different problems (presentation). •Technological requirements and economic conditions in construction process. The classes are focused on the economic approach to civil engineering, and uses building site as the example. Also, health and safety regulations and technological problems occurring on the building site. The course ends with a project for evaluation.	
Assessment methods: Individual project paper report	
Recommended reading: 1.Stanisław Fic: Building structures in theory and practice; Pope John Paul II School of Higher Education in Biała Podlaska. Faculty of Economic and Technical Department of Technical Sciences, Biała Podlaska 2013. 2.Tomasz Błaszczuński: Durability and repair of building structures. Wrocław : Dolnośląskie Wydawnictwo Edukacyjne, 2010. 3.Wolfgang Schueller: High-Rise Building Structures. John Wiley	

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Course name: Building structures-docks and coasts	
Course code: M031	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kurek Andrzej, a.kurek@po.opole.pl	
Prerequisites: English (min B1 level), Knowledge of mathematics, mechanics and strength of materials	
Objectives of the course and learning outcomes: Upon completing the course, the students will gain knowledge about different technologies and technics used in construction of coast and docs structures.	
Teaching program: Introduction to civil engineering. Introduction to building engineering. Material base in building industry and building technologies Basic parts and elements of building, their mutual weaves. Structural building's systems - characteristic and principles of the designing, spans and space, module in Civil Engineering if coastal structures. Traditional wall (brick) structures - materials of the wall systems, structure of support walls, technologies of wall structures, building's stiffening. Non-traditional wall structures - masonry, brickworks, sandwich walls, concrete walls, physical characteristics of masonries. Modern technologies used in coastal constructions. Coastal constructions and its economic conditions.	
Assessment methods: Individual project paper report	
Recommended reading: 1.Stanisław Fic: Building structures in theory and practice, Pope John Paul II School of Higher Education in Biała Podlaska. Faculty of Economic and Technical Department of Technical Sciences. - Biała Podlaska, 2013. 2.Tomasz Błaszczński: Durability and repair of building structures, Wrocław : Dolnośląskie Wydawnictwo Edukacyjne, cop. 2010. - 239, [1] s. : il. ; 25 cm. 3.Wolfgang Schueller: High-Rise Building Structures. John Wiley	

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Course name: Basic of Automatics	
Course code: M032	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Brol Sebastian, s.brol@po.opole.pl Graba Mariusz, m.graba@po.opole.pl	
Prerequisites: English (min B1 level), Basics of mathematics and physics	
Objectives of the course and learning outcomes: Objectives: Gain knowledge about two and three state control, continuous control Outcomes: The Student can design two- and three state control system and tune it, additional the Student can handle and tune control systems using P, PI, PID controllers.	
Teaching program: This course focuses on basic automation systems, control solutions and identification methods. Additional computer aided methods of modeling are discussed and used. At the beginning short description of both logic control combinatory and sequential is explained and discussed followed by appropriate exercises made with use of Simulation software. Next, the computer aided modeling of plants and practical aspects of its identification will be explained. Finally control with open and closed loop is analyzed in context of use P, PI and PID controllers with emphasis on quality of control. The course will follow as pointed out below: - Basic of control systems - Logical combinatory control - Logical sequential control - Modeling of plant - Identification of plans - Control in open loop - Control in closed loop - P, PI, PID controllers - Quality of control - Adaptive control	
Assessment methods: Laboratory reports	
Recommended reading: 1.Materials prepared by lecturer 2.Shimon Y. (Ed.), Handbook of Automation, Springer ,2009, LXXVI, 1812p. With DVD.. 3.David W. Pessen, Industrial Automation: Circuit Design and Components, John Wiley	

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Course name: Statistics	
Course code: M033	Form of class: Lecture,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Borsuk Grzegorz, g.borsuk@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Basic knowledge of selected fields of mathematics.	
Teaching program: Methods of statistics, presentation of the basic tools of descriptive statistics, statistical areas, sufficient statistics and statistical information, schemes and methods of statistical inference, the point estimate, mean square error, variance of the estimator, Interval estimation of the sample, Model of linear and multiple regression, diagnostics and testing.	
Assessment methods: Exam (test).	
Recommended reading: 1.Springer handbook of engineering statistics, Susan L. Albon et al., Springer, 2006 2.Statistical theory and modelling for turbulent flows, Durbin, B.A. Pettersson R., John Willey.	

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Course name: Basics of ecology	
Course code: M034	Form of class: Lecture, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Kuczuk Anna, a.kuczuk@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level), fundamentals of chemistry and biology	
Objectives of the course and learning outcomes: Basic ecological terms, ecology, ecosystem, biotic community, biosphere, environmental science. Composition of a living organisms. Biotic and abiotic elements of environment and relations between them. Population and its characteristics. Ecosystem – building of organic matter, circulation of matter - photosynthesis, heterotrophs, reducers. Energy in ecological systems. Examples of chosen ecosystems: soil and water ecosystem and – description, trophic chains, protection. Chosen issues in the field of environmental biology. Trip: visit to farm – obtain information about agroecosystem/ or alternative trip to forest/ on the lakes – to obtain information about phenomena occurring in these ecosystems.	
Teaching program: Ecology, Biology, Environmental protection - basic differences. Chemistry of life - elements and compounds that build a living organism. Levels of organization of the living world - organism, species, population, ecosystem, biosphere, biotic and abiotic factors. Population - its density and structure, population barriers. Interactions between organisms - including trophic relations, chemical interactions. Biocoenosis - diversity and stability of biocenoses, structure and organization. Ecosystem - productivity of ecosystems, energy flow and circulation of matter, autotrophs and photosynthesis, heterotrophs, reducers. Circulation of carbon, nitrogen and water. Biosphere. Selected issues in environmental biology - biology in pest control. Trip: visit to farm or alternative trip to forest/ on the lakes.	
Assessment methods: Written test or presentation of task.	
Recommended reading: S. Dash, M. Dash, Fundamentals Of Ecology 3rd Edition. Publisher: Mcgraw Higher Ed. 2009. Odum E., Barrick M., Barrett G.W., Fundamentals of Ecology Paperback (English) 5th Edition. 2005. Guzman Casado G.I., Gonzales de Molina M., Energy in agroecosystems – a tool for assessing sustainability. 2017.	

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Course name: Environmental Chemistry	
Course code: M035	Form of class: Lecture, Group tutorial, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Guziałowska-Tic Joanna, j.guzialowska@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: In this course students will use the fundamental principles of chemistry to gain an understanding of the source, fate and reactivity of compounds in natural and polluted environments. Emphasis will be placed on the environmental implications of energy utilization and on the chemistry of the atmosphere, hydrosphere, and lithosphere. Environmental issues that will be discussed include climate change, air pollution, stratospheric ozone depletion, pollution and treatment of water sources, and the utilization of insecticides and herbicides.	
Teaching program: Atmospheric Chemistry and Air Pollution: • stratospheric Chemistry: The Ozone Layer , • the Ozone Holes, • the Chemistry of Ground-Level Air Pollution, • the Environmental and Health Consequences of Polluted Air—Outdoors and Indoors. The Greenhouse Effect, Climate Change and CO ₂ : • the Greenhouse Effect. • CO ₂ Emissions, and Global Climate Change. Water chemistry and Water Pollution: • the Chemistry of Natural Waters, • the Pollution and Purification of Water. Toxic Organic Compounds: • toxic Heavy metals, • pesticides, • dioxins, Furans, and PCBs, • other Toxic Organic Compounds of Environmental Concern, • wastes, soils and sediments.	
Assessment methods: Laboratory: active participation, laboratory report Lecture: written/test paper examination	
Recommended reading: 1. Manahan, Stanley E. "Frontmatter" Fundamentals of environmental chemistry. Boca Raton. CRC Press, LLC, 2001. 2. Hites R.A., Raff J.D. Elements of environmental chemistry. Wiley 2012. 3. Jorge G. Ibanez, Margarita Hernandez-Esparza, Carmen Doria-Serrano, Arturo Fregoso-Infante, Mono Mohan Singh. Environmental Chemistry. Fundamentals. Springer, 2007.	

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Course name: Environmental Analytics	
Course code: M037	Form of class: Lecture, Laboratory, Seminar,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Guziałowska-Tic Joanna, j.guzialowska@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: The aim of this course is to give the students a deeper introduction to the theory and practice of environmental analytics.	
Teaching program: Lecture and seminar: • Environmental samples preparation (water, wastewater, sludge), • Fundamentals of UV/VIS spectroscopy and IR spectroscopy, • Beer-Lambert's law, • Separation techniques, • Liquid chromatography (TLC, HPLC), • Gas chromatography, • Ion-exchange chromatography (HPIC), • Detectors in chromatographic analysis, • Examples of application of chromatographic methods in environmental science, • Data analysis (the calibration curves, spectral analysis, quality and quantity analysis). Laboratory: 1. Environmental samples preparation (solid phase extraction and Soxhlet extraction). 2. Spectrometric methods in water and wastewater quality control. 3. Measurement of total, organic and inorganic carbon in environmental samples. 4. Separation, detection and determination of selected organic compounds (non steroidal anti-inflammatory drugs, antibiotics and preservatives) in aquatic samples by means of high performance liquid chromatography (HPLC).	
Assessment methods: Laboratory: active participation, laboratory reports Lecture: test paper examination	
Recommended reading: 1. Reeve R.N.: Introduction to environmental analysis, John Wiley	

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Course name: Water Technology	
Course code: M038	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 3	Number of hours per semester: 45
Language of instruction: English	
Name of the lecturer and contact information: Kłosok-Bazan Iwona, i.klosok-bazan@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: The course presents technologies, installations and equipment for physical, biological and chemical water treatment. This course gives an insight into the different technologies of municipal and industrial water treatment.	
Teaching program: Study of the sources of water and the public health aspects of water supply; chemical, physical and bacteriological standards of water quality; types of water treatment plants; and water treatment procedures, operation, maintenance, storage and distribution. Examines basic fundamentals of laboratory analysis with an emphasis on applied chemical and microbiological procedures for water treatment plant operators. Includes procedures and techniques used in physical, chemical, bacteriological and biological examination of water/wastewater.	
Assessment methods: Written test, oral assesment, , laboratory reports	
Recommended reading: 1.CHEREMISINOFF N., Handbook of Water and Wastewater TreatmentTechnologies; 2.The Nalco Water Handbook - accessible in electronic version in our library 3.BOURKE N., CARTY G., CROWE M., LAMBERT M.: Water Treatments Manuals. Environmental Protection Agency 1995	

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Course name: Wastewater treatment	
Course code: M039	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Boguniewicz-Zabłocka Joanna, j.boguniewicz@po.opole.pl	
Prerequisites: English (min B1 level), Fundamentals of mathematics, chemistry, biology	
Objectives of the course and learning outcomes: The main objectives of the course are to: 1. Introduce the need for wastewater treatment. 2. Investigate the various constituents in wastewater. 3. Introduce the changes in quantity and quality of wastewater, quality control. 4. Expose students to the various chemical and biological treatment techniques employed to treat wastewater for various uses. 5. Provide an analysis of the characteristics of wastewater treatment processes After completion of the course students are expected to: - Acquire the knowledge for the need for water quality and how to achieve it. - Name and categorize the various processes used in wastewater treatment. - Differentiate between the processes of treatment. - Determine the characteristics and the effect of the treatment processes.	
Teaching program: 1.Introduction to wastewater and wastewater network 2.Domestic wastewater and industrial wastewater control 3.Physical, chemical and microbiological characterization of water; wastewater and air quality 4.Sedimentation, flocculation filtration 5.Biological treatment methods 6.Reactor tanks 7.Chemical treatment (softening, absorption and ion exchange) 8.Conventional unit operations and processes for wastewater	
Assessment methods: Midterm oral exams, final test paper exam	
Recommended reading: 1.Forster C. F.: Wastewater treatment and technology. ASCS Press 2003, Wastewater Engineering: Treatment and Reuse. McGraw-Hill's 2002. 2.James R. Mihelcic , Julie B.: Environmental Engineering: Fundamentals, Wiley, 2009 3.James R. Mihelcic , Julie B. Environmental Engineering: Fundamentals, Sustainability, Design, Wiley 2009 4.Ronald L. Droste: Theory and Practice of Water and Wastewater Treatment, Wiley 1996.	

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Course name: Industrial Wastewater	
Course code: M040	Form of class: Lecture,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Boguniewicz-Zabłocka Joanna, j.boguniewicz@po.opole.pl	
Prerequisites: English (min B1 level), Fundamentals of wastewater treatment, biology.	
Objectives of the course and learning outcomes: The main objectives of the course are to: 1. Introduce the need for industrial wastewater treatment 2. Investigate the wastewater from different industrial sectors 3. Introduce the changes in quantity and quality of wastewater 4. Provide an analysis of the characteristics of industrial wastewater treatment After completion of the course students are expected to: - Acquire the knowledge for the need for wastewater treatment - Name and categorize the various processes used in industrial wastewater treatment - Determine the characteristics and the effect of the treatment processes.	
Teaching program: 1.Introduction 2.Permissions required for industril wastewater effluent 3.The types of industrial wastewaters 4.Inorganic industrail wastewaters 5.Organic industrail wastewaters 6.Amounts of industrail wastewaters 7.The effects of industrail wastewater to municipal WWTP and to the environment. 8.Other factors related to the effects of industrail wastewater.	
Assessment methods: Midterm oral exams, final test paper exam.	
Recommended reading: 1.Forster C. F.: Wastewater treatment and technology. ASCS Press 2003,Wastewater Engineering: Treatment and Reuse. McGraw-Hill's 2002. 2.Czysz. W, D.A. Schneider, H Rump, et al: Waste Water Treatment Technology. Origin, Collection, Treatment,and Analysis of Waste Water. Springer- Verlag, Berlin, Germany, 1989. 3.Tchobanoglous, G., Burton, F.L., and Stensel, H.D. (2003). Wastewater Engineering (Treatment Disposal Reuse) / Metcalf	

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Course name: Technical Systems of Sanitary	
Course code: M041	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Pochwała Sławomir, s.pochwala@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: The main objective of the course is to provide students with a large knowledge of the design of water supply networks and sewage systems.	
Teaching program: Design of water supply and sewerage: - A specific area on the map with a scale of 1:10,000 to design a network - Calculation of the demand of water for public supply - Calculation of the demand of water for factories - Calculation of maximum demand on the needs of the neighboring village - Draw up a scheme to carry out computational and hydraulic calculations (diameters of pipelines, flow velocity) - Calculation of the maximum hourly cutting projected networks - Calculation of cutting fire - Calculation of the minimum cutting - Applying to plan situational altitude on a scale of 1:10000 scheme projected networks - Execution of the longitudinal profile of the selected section of networks.	
Assessment methods: Graded project.	
Recommended reading: 1.Koike, Takeshi: Critical urban infrastructure handbook, Water Supply System: Design Aspects, 2015. 2.Don D. Ratnayaka, Malcolm J. Brandt and K. Michael Johnson: Water Supply (Sixth Edition), 2009. 3.Dragan Savic, John Banyard: Water Distribution Systems, 2011.	

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Course name: Modeling of Water Dystrybution Systems	
Course code: M042	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 3	Number of hours per semester: 45
Language of instruction: English	
Name of the lecturer and contact information: Spyra Andrzej, a.spyra@po.opole.pl	
Prerequisites: English (min B1 level), Working with computer. Knowledge of the basic physical laws of hydrostatics and hydrodynamics	
Objectives of the course and learning outcomes: This course provides an introduction to the hydraulic modelling of water distribution systems. This is followed by an introduction to using EPANET as a calculation tool (EPANET is used as demonstration software although the basic principles taught are applicable to any water distribution modelling software. The course covers the basic theory followed by practical computer sessions strengthening the material covered.	
Teaching program: 1. Lecture: Fluid properties, statics	
Assessment methods: Individual project report, computer-based problem solving work, written test	
Recommended reading: 1. Arnalich S.: Epanet and Development. How to calculate water networks by computer. Water and Habitat, 2011 2. Arnalich S.: Epanet and Development: A progressive 44 exercise workbook. Water and Habitat, 2011 3. Rossman L.: Epanet 2 Users Manual. US Environmental Protection Agency, Cincinnati, USA, 2000	

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Course name: Hydrology and Hydraulics	
Course code: M043	Form of class: Lecture, Group tutorial, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 3	Number of hours per semester: 45
Language of instruction: English	
Name of the lecturer and contact information: Spyra Andrzej, a.spyra@po.opole.pl Wydrych Jacek, j.wydrych@po.opole.pl	
Prerequisites: English (min B1 level), Advanced knowledge of mathematics	
Objectives of the course and learning outcomes: The primary objective is the demonstration and understanding of the fundamental concepts and processes associated with the hydraulic and water quality design, operation and performance aspects of agriculture and urban drainage systems. Modelling tools will be used to support the design of urban drainage systems (incl. pumping stations, overflows, and other flow regulating structures). The tools will also be used to develop understanding in current pollution problems, and to identify mitigation/rehabilitation measures. In this way, the students will gain a sound understanding of the modelling tools, which can be used to aid decision-making in pollution management, and will get experience in the use of modelling tools through applications within the Integrated Project case studies.	
Teaching program: Lectures/practice: - Introduction - Hydrologic cycle, water balance, precipitation - Evaporation, transpiration, and infiltration - Direct Surface Runoff Stream flow Measurement Hydrographs - Unit hydrographs and design Hydrographs - Flood Frequency Analysis - Flood Routing - Open Channel Flow Principles Uniform Flow and Design of channels - Critical flow and Gradually varied Flow - Roadway Drainage System- Culverts Computer model: CulvertMaster - Urban Hydrology and Urban Drainage Systems - Computation of Storm water - Storm Sewers Design, Detention Pond - Groundwater Flow - Pressure Flows: Pipe System - Pumps and Turbines - Storage and Control Structures Laboratory: - Closed-Conduit Flow: Pipe Systems; Frictional Resistance and Minor Losses; Pipe Networks; Pumps; Water Distribution Networks - Open Channel Flow: Steady Uniform Flow; Flow Through Transitions; Gradually Varied Flow; Rapidly Varied Flow; Discharge Measurements - Engineering Hydrology: Drainage Design; Rainfall-Runoff Predictions; Unit Hydrographs; Design Flood Frequency Estimation	
Assessment methods: 1. 6 quantitative problem sets solved using Excel or similar program, literature review of relevant technical journals. 2. 6 quantitative and qualitative lab reports that build toward the design project and follow recommended writing style and format.	

Recommended reading:

All readings will be scanned into the course. If students are unhappy with the quality of scans then they are advised to purchase the texts below.

1. Philip B. Bedient, Wayne C. Huber: Hydrology and Floodplain Analysis, Prentice Hall, 2002.
2. Mays L.W. Hydraulic Design Handbook, McGraw-Hill, Inc., New York 1999
3. Potter T.D. Handbook of Weather, Climate and Water- Atmospheric Chemistry, Hydrology and Social Impacts, Wiley-Interscience 2003

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Course name: Meteorology and Climatology	
Course code: M044	Form of class: Lecture, Group tutorial,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Wydrych Jacek, j.wydrych@po.opole.pl	
Prerequisites: English (min B1 level), Linear Algebra and Differential Equations; Multivariable Calculus; Dynamics	
Objectives of the course and learning outcomes: This course aims at developing a sound understanding of the physical processes that influence weather and climate. Students will be able to acquire the basic skills used in meteorology and climatology.	
Teaching program: - Introduction; Meteorology and climatology as sciences - The Earth System; Atmosphere and its features - Basic meteorological elements and their climatological characteristics - Atmospheric Thermodynamics, Radiative Transfer; Atmospheric Chemistry - Cloud Microphysics, Atmospheric Dynamics; General atmospheric circulation - Weather Systems; Atmospheric Boundary Layer - Climate Dynamics; Basic climate-forming factors - Climate change; Impacts of climate change - Paleoclimate; Different sources of meteorological data and information - Weather forecast; Climate models; Climate scenarios	
Assessment methods: Formal assessment includes a Mid-Term Test and a Final Test. Both these tests are comprehensive and cover the entire course material up to that date, from lectures, exercises and readings.	
Recommended reading: All readings will be scanned into the course. If students are unhappy with the quality of scans then they are advised to purchase the texts below. 1. Potter T.D. Handbook of Weather, Climate and Water- Atmospheric Chemistry, Hydrology and Social Impacts, Wiley-Interscience 2003 2. Ahrens C.D. Meteorology Today: An Introduction to Weather, Climate, and the Environment, Cengage Learning, 2008 3. Carbone G. Exercises for Weather	

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Course name: Air Pollution Control	
Course code: M045	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Olszowski Tomasz, t.olszowski@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Assimilation and consolidation of chosen information in scope of atmospheric air menaces, and possibilities of air quality control. Students have to be friendly with fundamentals of air contamination measurements. They will give back raise the level of competence in understanding and identifying the phenomena and processes in the atmosphere, which may adversely affect air quality.	
Teaching program: Basic concepts in the field of air protection and air pollution. Description of the atmosphere, air composition, characteristics of gaseous and particulate pollutants. Characteristics and taxonomy of natural and anthropogenic sources of air pollution. Methods of measurement of gaseous and particulate pollutants in ambient air. Impact of climate variability on the spread of contamination. Dust deposition research. Biomonitoring of ambient air.	
Assessment methods: lecture: oral exam-test, individual consultations laboratory: active participation under the laboratory, written laboratory report	
Recommended reading: 1. Daniel Vallero: Fundamentals of Air Pollution. Daniel Vallero. Elsevier Inc., 2008 (fourth edition). 2. Karl B. Schnelle, Jr., Charles A. Brown: Air Pollution Control Technology Handbook. Taylor and Francis, 2001. 3. Chris Windler: Contaminated Air Protection: Proceedings of the Air. Chris Windler . BALPA. Sydney, Australia, 2005.	

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Course name: Pollution Diffusion in Atmosphere	
Course code: M046	Form of class: Lecture, Laboratory,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 3	Number of hours per semester: 45
Language of instruction: English	
Name of the lecturer and contact information: Wydrych Jacek, j.wydrych@po.opole.pl	
Prerequisites: English (min B1 level), Elementary knowledge on flow and diffusion in boundary layer of atmosphere.	
Objectives of the course and learning outcomes: Basic knowledge on the main problems of air pollution, air pollution spreading in atmosphere, dry and wet deposition, chemical reactions and possibilities of air pollution modelling.	
Teaching program: - Sources of air-pollution, air-pollution spreading in the earth atmosphere, - Dry and wet deposition, types of anthropogeneous compounds, - Bases of their chemistry, - Space scaling of air-pollution transport, - Lagrangian and Eulerian models, plume models, - Puff models, dispersion modeling, - Practical application of Gaussian models, - Types of meteorological conditions for air-pollution spreading, - Effects of air-pollution on meteorological processes.	
Assessment methods: Formal assessment includes a Mid-Term Test and a Final Test. Both these tests are comprehensive and cover the entire course material up to that date, from lectures, exercises and readings.	
Recommended reading: All readings will be scanned into the course. If students are unhappy with the quality of scans then they are advised to purchase the texts below. a) Lyons T.J., Scott W.D.: Principles of Air Pollution Meteorology, Belhaven Press, London 1990 Heinsohn R.J., Kabel R.L.: Sources and Control of Air Pollution, Prentice Hall Upper Saddle River, New Jersey 1996. b) Potter T.D. Handbook of Weather, Climate and Water- Atmospheric Chemistry, Hydrology and Social Impacts, Wiley-Interscience 2003 c) Ramaswami A. Integrated environmental modeling- Pollutant Transport, Fate and Risk in the Environment, Wiley 2005	

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Course name: Waste management	
Course code: M047	Form of class: Lecture, Project,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Król Anna, a.krol@po.opole.pl Ligus Grzegorz, g.ligus@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of waste management. Basic knowledge about methods of waste utilization.	
Objectives of the course and learning outcomes: This course covers the main principles in the management of industrial waste. The student learns industrial technologies and associated waste generation. Student plans reuse of waste and knows the main principles of these processes.	
Teaching program: Teaching program for waste management course is composed of the following subjects: Lecture: -Strategy for waste management -Systematics of waste -Low and non-waste technologies -Methods of utilization of waste -Recycling of waste in industry processes -Waste disposal -Waste to energy -Industrial waste disposal Project: -Calculate the number of containers required for the separate collection of waste at the site of the industrial plant -Calculate the volume and the number of necessary bins, containers and silos for the collection of industrial waste in the manufacturing plant -Selection of warehouse space -Selection of road transportation of waste inside and outside the production plant -Selection of methods of waste reuse.	
Assessment methods: Individual project, presentation.	
Recommended reading: 1.Ashby M.F. Materials and the Environment (Second Edition) Elsevier 2013 2.Ekstrom K.M., Waste Management and Sustainable Consumption: Reflections on Consumer Waste, ROUTLEDGE London 2014 3.Tchobanoglous G.,Theisen H.,Vigil S.A, Integrated Solid Waste Management: Engineering Principles and Management Issues, McGraw-Hill Publishing Co.	

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Course name: Environmental Engineering	
Course code: M048	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kłosok-Bazan Iwona, i.klosok-bazan@po.opole.pl Król Anna, a.krol@po.opole.pl Kuczuk Anna, a.kuczuk@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of waste management, wastewater treatment, air protection. Basic knowledge about different industries and production technologies.	
Objectives of the course and learning outcomes: The course presents technologies, installations and equipment for environmental protection in industry. This course gives an insight into the different technologies and their influence on environment.	
Teaching program: Teaching program for Environmental Engineering course is: characteristics of the production process, localization of industry, describe of technological process, production scheme, overview of the influence of different stages of production on the environment, methods and equipment for environmental protection in industry, methods and equipment for environmental protection in industry during accidents and unexpected events. During course students with teacher work on innovation solutions when choosing equipment for environmental protection in industry.	
Assessment methods: Individual project, presentation	
Recommended reading: 1. Ashby M.F. Materials and the Environment (Second Edition) Elsevier 2013 2. Ekstrom K.M., Waste Management and Sustainable Consumption: Reflections on Consumer Waste, ROUTLEDGE London 2014 3. Tchobanoglous G., Theisen H., Vigil S.A, Integrated Solid Waste Management: Engineering Principles and Management Issues, McGraw-Hill Publishing Co.	

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Course name: Applications of Geographic Information Systems (GIS)	
Course code: M049	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Wydrych Jacek, j.wydrych@po.opole.pl	
Prerequisites: English (min B1 level), There are no prerequisites but some background in computer science or geography is helpful.	
Objectives of the course and learning outcomes: By the end of the course, students will be able to: - Identify, locate, and acquire spatial data pertinent to projects in their field of interest, as well as pinpoint significant gaps in or problems with existing information. - Evaluate the appropriateness of the existing data sources for use in a project. - Understand the data creation process and create simple data sets and/or add to existing data - Create spatial data from tabular information that includes a spatial reference - Perform basic spatial analyses (attribute and spatial queries, buffering, overlays) as well as linking these methods together in a more complex analytical model. - Create high-quality maps and associated graphics and text that clearly communicate spatial information and analyses.	
Teaching program: - Introduction - GIS Data and Spatial Models - Topology and Spatial Operations - Projections, Scale and Coordinate Systems - Thematic Mapping - GIS Analysis - Cartography - Network Modeling	
Assessment methods: Three homework assignments, a group project and two individual final projects.	
Recommended reading: All readings will be scanned into the course. If students are unhappy with the quality of scans then they are advised to purchase the text below. a) Longley P.A. GIS teoria i praktyka; eng. Geographic Information Systems and Science, PWN, Warszawa 2008 b) Galati S. Geographic Information Systems Demystified, Artech House Publishers, 2006 c) Goor W. GIS Tutorial 1: Basic Workbook, Esri Press, 2013 d) Allen D. GIS Tutorial 2: Spatial Analysis Workbook, Esri Press, 2013	

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Course name: Noise measurement and control	
Course code: M050	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Ligus Grzegorz, g.ligus@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of metrology and theory of machines	
Objectives of the course and learning outcomes: Acquire knowledge and skills in the field of noise measurement and control.	
Teaching program: 1.Measurement of the Sound Pressure Level and Sound Power Level from the industrial sources 2.Occupational noise measurement 3.Road noise measurement 4.Calculation of the Equivalent Sound Level 5.Acoustic testing of buildings partitions and sound-absorbing baffles 6.Acoustic testing of industrial silencers	
Assessment methods: Laboratory reports	
Recommended reading: 1. Biel D. A., Hansen C., H., Engineering noise control: Theory and practice, Spon Press, London, 2009 2. Berger E. H., The noise manual, AIHA, Fairfax, 2003 3. Instructions provided by the lecturer	

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Course name: Building energy audit	
Course code: M051	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Ligus Grzegorz, g.ligus@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of civil engineering, buildings structures and heat transfer.	
Objectives of the course and learning outcomes: Acquire knowledge and skills in the field of building's heat load calculation.	
Teaching program: 1.Principles of 3D building computer modelling 2.Principles of computer aided calculations of heat load of individual rooms including heat-transfer coefficients for walls, floors, roofs and flat roofs, heat losses for individual rooms, heat loss for the whole building, heat balance for the apartment building heating period, radiators selection 3.Guidelines for computer aided calculation of heat load with the used of selected software 4.Preparation of the typical heat load calculation for selected building.	
Assessment methods: Individual/group project paper report.	
Recommended reading: 1.Krigger J., Residential Energy: Cost Savings and Comfort for Existing Buildings, Saturn Resource Management, 2014 2.Pedersen C.O., Cooling and Heating Load Calculation Principles, American Society of Heating, Refrigerating and Air-Conditioning Engineers, 1998 3.User's manual for software provided by the lecturer.	

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Course name: Applied Computer Image Analysis	
Course code: M052	Form of class: Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 3	Number of hours per semester: 45
Language of instruction: English	
Name of the lecturer and contact information: Ligus Grzegorz, g.ligus@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of informatics and theory of machines.	
Objectives of the course and learning outcomes: Acquire knowledge and skills in the field of noise measurement and control.	
Teaching program: 1. Multiphase flow structures recognition with the use of image grey level analysis 2. Liquid film thickness measurement with the use of image grey level analysis 3. Optical methods for melting point identification 4. Assessment of sedimentation process with the use of Digital Particle Image Velocimetry 5. Assessment of mixing process with the use of Digital Particle Image Velocimetry 6. Assessment of liquid transport with the use of Digital Particle Image Velocimetry 7. Visualization techniques for aerodynamic testing of vehicles, buildings and aircraft 8. Visualization techniques for hydrodynamic testing of ships 9. Visualization techniques for aerodynamic testing of wind turbine 10. Application of velocity vector field analysis for heat exchangers 11. Application of streamline analysis for heat exchangers 12. Identification of the cavitation phenomena with the use of Digital Particle Image Velocimetry 13. Optical methods for air carrying velocities determination in the pneumatic solid transport systems 14. Assessment of separation process with the use of Digital Particle Image Velocimetry.	
Assessment methods: Laboratory reports.	
Recommended reading: 1. Adrian R.J, Westerweel J., Particle Image Velocimetry, Cambridge University Press, New York, 2011 2. Obidi T.Y, Theory and Applications of Aerodynamics for Ground Vehicles, SEA International, Warrendale, 2014 3. M.L. Hansen, Aerodynamics of Wind Turbines, Routledge, London, 2015 4. Instructions provided by the lecturer.	

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Course name: Fuels Combustion in Industry	
Course code: M053	Form of class: Lecture, Group tutorial, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Wzorek Małgorzata, m.wzorek@po.opole.pl	
Prerequisites: English (min B1 level), Fundamentals of mathematics and thermodynamics	
Objectives of the course and learning outcomes: The aim of this course is to give the students a theoretical and practical knowledge of fuels combustion in industry, additional expose students to general laboratorial techniques of taking measurements of properties of fuels and emissions	
Teaching program: Lecture: Basic information about fuels, clean fossil and alternative fuels; Coal chemistry, conversion and combustion, Technologies for combustion in industry: power plants, incineration plants, cement factories ect.; Exercise: Calculations of high heat value and low heat value of solid, liquid and gases fuels; Calculations of dry and humidity combustion gas contents, emission levels; Complete combustion and incomplete combustion; Energy balance of different boilers; Efficiency of combustion process. Laboratory: Introduction to the course. Samples preparation of different type of fuels; Analysis of physical properties of fuels (content of water, bulk density, particle size distribution, granulation; Measurement of High Heating Value (HHV) of different types of fuels and calculation of LHV; Analysis of ash content and volatile matter Measurement of pollution emission during combustion 2 types of fuels.	
Assessment methods: Lecture/Exercises: Exam-test Laboratory: Active perception under laboratory, laboratory reports	
Recommended reading: 1.The internal materials prepared by lecturers 2.Miller B.G: Clean Coal Engineering Technology, Butterworth-Heinemann, 2010 3.Williams A. at al.: Combustion and Gasification of Coal, Taylor	

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Course name: Alternative Energy Sources	
Course code: M054	Form of class: Lecture, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 3	Number of hours per semester: 45
Language of instruction: English	
Name of the lecturer and contact information: Anweiler Stanisław, s.anweiler@po.opole.pl	
Prerequisites: English (min B1 level), Knowledge on mechanics, fluid dynamics, heat transfer, environmental aspects of Engineering and modelling	
Objectives of the course and learning outcomes: Energy demand and production, types and distribution of energy sources, alternative and renewable energy sources, renewable energy measurements and calculations, environmental impact and sustainability.	
Teaching program: General rules of environmental engineering in the area of alternative and renewable energy sources. Basic terms, kinds and aims of environmental engineering as an aspect of modern alternative and renewable energy storage, conversion and transmission. Global energy demand and production, types of energy sources, distribution of energy sources, alternative and renewable energy sources exploitation, innovative approach to energy production, renewable energy measurements and calculations. Solar, wind, biomass, water, geothermal, radioactive and other alternative types of energy. Assessing and measuring environmental impact and sustainability. Decarbonisation. Materials applied in eco-building industry. Passive and active renewable energy harvest. Examples of specific renewable energy technologies and its applications.	
Assessment methods: Presentation of prepared scientific paper	
Recommended reading: 1.Lars ROSE (editor): Energy: Modern Energy Storage, Conversion, and Transmission in the 21st Century (Energy Science, Engineering and Technology). Nova Science Publishers, New York, 2013. [ISBN: 978-1619425262] 2.Jiri KLEMES (editor): Assessing and Measuring Environmental Impact and Sustainability. Elsevier, Oxford, 2015 [ISBN: 978-0-12-7999685] 3.Mariano Martin (editor): Alternative energy sources and technologies: Process design and operation. Springer, 2016 4.Myer Kutz: Environmentally Conscious Alternative Energy Production. Wiley, 2008. 5.Felix A. Farret, M. Godoy Simoes: Integration of Alternative Sources of Energy, Wiley 2006.	

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Course name: Applied Thermodynamics	
Course code: M055	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 4	Number of hours per semester: 60
Language of instruction: English	
Name of the lecturer and contact information: Tańczuk Mariusz, m.tanczuk@po.opole.pl	
Prerequisites: English (min B1 level), Basics of thermodynamics	
Objectives of the course and learning outcomes: To improve knowledge and understanding of basic rules and laws of thermodynamics. To extend the skills of calculating thermodynamic cycles of chosen thermal machines. To get familiar with case studies of thermal machines that are in operation	
Teaching program: Lecture: First and second law of thermodynamics. Energy balances. Steam cycles. Steam turbine plants. Gas cycles. Gas engines and gas turbines. Combined heat and power plants. Efficiency: internal, net, gross, thermal, mechanical, electrical. Improving efficiency of the cycles and plants: methods with technological details as well as graphical representation in different coordinate systems (specific enthalpy v. specific entropy, temperature v. specific entropy). Exercises: Calculating energy balances of the plants. Working with case study examples. Calculations with Engineering Equation Solver (EES).	
Assessment methods: Written/test paper examination, practical classes assessment	
Recommended reading: 1.R. M. Helsdon, N. Hiller and G. E. Walker. Introduction to Applied Thermodynamics. A volume in The Commonwealth and International Library: Mechanical Engineering Division. ISBN: 978-0-08-010504-8 2.R.K. Rajput. Thermal Engineering. Laxmi Publications, 2005 3.G. Salvendy: Handbook of Industrial Engineering. Technology and Operations Management, Wiley and Sons 2001	

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Course name: Energy and Environmental Analysis and Prefeasibility Studies	
Course code: M056	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 4	Number of hours per semester: 60
Language of instruction: English	
Name of the lecturer and contact information: Tańczuk Mariusz, m.tanczuk@po.opole.pl	
Prerequisites: English (min B1 level), Basics of thermodynamics, computer skills (MS Excell or similar).	
Objectives of the course and learning outcomes: To get and understand know-how on technical and economic analysis of energy projects. To be able to make feasibility studies of real cases applications.	
Teaching program: Basics of economical calculations. Introducing into costs and benefits analysis. Discounted method. Cash flows. Net Present Value. Simple and Discounted Payback Time. Internal Rate of Return. Building MS Excell worksheets for calculations of economic efficiency of the projects for different energy modelling cases, including industrial and domestic project of energy generation and supply. Implementation of sensitivity analysis modules into the calculation. Presentation of the results with use of active charts. Proper conclusion formulation and discussion of the results.	
Assessment methods: Oral examination and practical classes assessment.	
Recommended reading: 1.Shannon P. Pratt, Robert F. Reilly, Robert P. Schweihs. Valuing a Business: The Analysis and Appraisal of Closely Held Companies. McGraw-Hill Education, 2000. 2.Munsaka, Temba. The Importance of Project Feasibility Study. 2016. ISBN 10: 3656535337. 3.D. Elliott: Sustainable Energy: Opportunities and Limitations. 2007. ISBN 978-0-230-24174-9	

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Course name: Modeling of Energy Systems	
Course code: M057	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 4	Number of hours per semester: 60
Language of instruction: English	
Name of the lecturer and contact information: Tańczuk Mariusz, m.tanczuk@po.opole.pl	
Prerequisites: English (min B1 level), Basics of thermodynamics, Energy conversion	
Objectives of the course and learning outcomes: To get the skills for modeling selected energy conversion system with use of a dedicated software. To get familiar with case studies of thermal machines regarding thermodynamic analysis	
Teaching program: Steam-water thermal cycles. Gas thermal plants. Heat generating facility versus cogeneration of heat and power (CHP units). Modelling of conventional plants integrated with removable energy systems. Steam power plants and heat generating and power plants. Methodology of modeling of energy conversion plants based on thermal cycles. Engineering equation solver - introduction and calculation examples. Implementation of techno-economic analysis modules into thermodynamic modelling. Optimization methods. Modelling of operation type of CHP units: heat tracking operation, electricity tracking operation, fuel tracking operation and mixed ones.	
Assessment methods: Written/test paper examination, practical classes assessment.	
Recommended reading: 1. Renaud Gicquel. Energy Systems: A New Approach to Engineering Thermodynamics. January 27, 2012 by CRC Press. 2. Introduction to Energy Systems Modelling Andrea Herbst, Felipe Toro, Felix Reitze, and Eberhard Jochem. Swiss Journal of Economics and Statistics, 2012, Vol. 148 (2) 3. Klemeš, Jirí Jaromír / Varbanov, Petar Sabev / Wan Alwi, Sharifah Rafidah Wan / Manan, Zainuddin Abdul. Process Integration and Intensification. Saving Energy, Water and Resources. May 2014, ISBN 978-3-11-030685-9.	

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Course name: Heating Systems	
Course code: M058	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Ligus Grzegorz, g.ligus@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of civil engineering, buildings structures and heating systems.	
Objectives of the course and learning outcomes: Acquire knowledge and skills in the field of heating systems design.	
Teaching program: 1. Principles of design central heating systems with the use of 3D modelling software (creation of buildings model, room zones, selecting and inserting of heat sources, radiators, floor heaters, supply and return pipe networks, valves, pumps, adjusts pre-sets of the pressure and flow rate governors, the requirements regarding the authorities of thermostatic valves) 2. Guidelines for designing on diagrams and plan views and presentation the results of calculations 3. Preparation of the central heating system project for selected building	
Assessment methods: Individual/group project paper report.	
Recommended reading: 1. Day A.R., Ratcliffe M.S., Shepherd K.J., Heating Systems, Plant and Control, Blackwell Science, Oxford, 2003 2. McDonald A.G., Magande H., Introduction to Thermo-Fluids Systems Design, Wiley, Chichester, 2012 3. User's manual for software provided by the lecturer.	

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Course name: Heat Transfer	
Course code: M059	Form of class: Lecture, Group tutorial, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 3	Number of hours per semester: 45
Language of instruction: English	
Name of the lecturer and contact information: Filipczak Gabriel, g.filipczak@po.opole.pl Pietrzak Marcin, m.pietrzak@po.opole.pl Placzek Małgorzata, m.placzek@po.opole.pl	
Prerequisites: English (min B1 level), Fundamentals of mathematics.	
Objectives of the course and learning outcomes: The objective of this course is to introduce (through a combination of theory, exercise and laboratory practice) to the basic heat transfer processes. This course examines three heat transfer mechanisms: conduction, convection and radiation. Heat transfer by conduction through one and multilayer flat and tubular walls. Free and forced convection description. The radiative emission characteristics of black and grey bodies will be discussed and radiative heat transfer between such bodies will be analyzed. Acquire knowledge about basics of heat transfer, including principles and calculations of heat transfer processes constituting background for analysis of heat exchangers, thermal equipment and systems. A theoretical discussion about selected processes of heat transfer will be followed based on laboratory experiment results.	
Teaching program: Topics to be covered: 1.Fundamentals of heat transfer processes (the basic requirements for heat transfer - driving force for heat transfer, rate of heat transfer and heat flux, thermal properties of different type of materials, thermal resistance). 2.Introduction and characteristic of heat transfer mechanisms: conduction (steady state one dimensional heat conduction, two dimensional heat conduction, transient heat conduction), convection and radiation. 3.Free and forced convection. 4.Radiation (processes and properties, concept of ideal and real thermal radiator - black and gray body, Stefan-Boltzmann Law, emittance - Kirchhoff's Law, heat exchange among black and grey bodies and enclosures). 5.Heat loss and insulation (heat loss from pipes, tubes and tanks - with and without insulation). Insulation materials (type, functions, examples). 6.Construction and operational parameters of heat exchangers (LMTD and NTU method). 7.Methods of heat transfer intensification. 8.Metal foams - production, properties and application. 9.Heat transfer - the general applications (fluidized beds, food processing, nuclear reactors, power plants, manufacturing and processing industries). 10.Selected heat transfer processes studied in the laboratory: convective heat transfer, heat transfer in pipes filled with metal foam, heat transfer in ribbed surface.	
Assessment methods: Lecture: test paper examination Exercise: active participation under the exercise, individual consultations Laboratory: active participation under the laboratory, written laboratory report Seminar: active participation under the seminar, essay (10 pages) or oral presentation of set task, individual consultations.	
Recommended reading: 1.Materials prepared by lecturer. 2.Bayazitulu Y., Özisik M. N.: Elements of heat transfer, McGraw-Hill, New York, 1988. 3.Frank P.: Fundamentals of Heat and Mass Transfer, Incropera [et al]. - 6th ed. - Hoboken, NJ, John Wiley	

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Course name: Heat and Mass Transfer Operations	
Course code: M060	Form of class: Lecture, Group tutorial, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 3	Number of hours per semester: 45
Language of instruction: English	
Name of the lecturer and contact information: Filipczak Gabriel, g.filipczak@po.opole.pl Płaczek Małgorzata, m.placzek@po.opole.pl	
Prerequisites: English (min B1 level), Fundamentals of thermodynamics and heat transfer mechanisms.	
Objectives of the course and learning outcomes: The aim of this lecture is to provide students with basic knowledge from the area of heat and mass transfer processes taking place in process engineering equipment. The course examines the three fundamental heat transfer mechanisms - conduction, free and forced convection and radiation. Solutions are obtained for flat and tubular walls, including heat transfer losses and insulation use. In mass transfer area student learns the issues of construction and operation of the apparatus for distillation and rectification processes.	
Teaching program: a) heat transfer: - fundamentals of heat transfer processes, - introduction to conduction (one- and two-dimensional, steady state conduction), - free and forced convection, - radiation (processes and properties, exchange between surfaces), - construction and work of heat exchangers, - examples of heat transfer processes studied in the laboratory include (convective heat transfer) - principal methods of heat transfer intensification, - insulation (type, material, functions); b) mass transfer: - theoretical basis for mass transfer, - analogy between mass and heat transfer, - characteristic of packed bed and plate columns and their internal equipment.	
Assessment methods: Course work/oral presentation/written test examination.	
Recommended reading: 1. Płaczek M., Filipczak G.: The internal faculty materials prepared by lecturers, 2. Boyazitoglu Y., Ozisik M.: Elements of heat transfer, McGraw-Hill, New York, 1988 3. Frank P. [at all]: Fundamentals of Heat and Mass Transfer, John Wiley	

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Course name: Processes and Technology of Production	
Course code: M061	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Wzorek Małgorzata, m.wzorek@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: The aim of this course is to give the students a practical knowledge on basic unit operations which are used in different technologies in industry.	
Teaching program: General view of unit operations in industry, Practical application of production technology (Introduction); Selected unit operations in separation processes: gravity settling process and filtration, basic equipment for liquid-solid sedimentation, filtration and application of membrane; Mixing in liquid phase and application of mixing processes; Drying process and main equipment for drying; Basic information about distillation, absorption and adsorption processes; Material distribution for level replacement, relations demonstrate, formula of preparation to development, method and techniques in process operations: crashing, sorting, transport.	
Assessment methods: Test, presentations, laboratory reports	
Recommended reading: 1.The internal materials prepared by lecturers 2.McCabe W.L., Smith J.C.: Unit Operations of Chemical Engineering, McGraw-Hill Chemical Engineering Series, 1976 3.Reynolds T.D., and Richards P.: Unit Operations and Processes in Environmental Engineering, PWS Publishing Company 1996	

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Course name: Process Engineering	
Course code: M062	Form of class: Lecture, Group tutorial, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Filipczak Gabriel, g.filipczak@po.opole.pl Płaczek Małgorzata, m.placzek@po.opole.pl	
Prerequisites: English (min B1 level), Fundamentals of mathematics and fluid dynamics.	
Objectives of the course and learning outcomes: The aim of this course is to give the students a deeper introduction to the theory of Process Engineering, to acquire advanced process engineering knowledge and prepare of students to general laboratorial techniques related to mechanical unit operations especially occurring in multiphase systems, as sedimentation, mixing of suspensions, filtration as well as any aspects of multiphase flow connected with other unit operations according to lecture program.	
Teaching program: General view of unit operations in process and chemical engineering – mechanical, heat and mass transfer operations (Introduction); Physical properties and units, total-energy equation of steady flow process, fluid flow phenomena (laminar and turbulent flows of Newtonian fluids, pressure drop); Multiphase flow of two-phase systems - flow patterns and pressure drop, applications to industry process and equipment, Selected unit operations in separation processes: gravity settling process and filtration, basic equipment for liquid-solid sedimentation and filtration; Mixing in liquid phase and application of mixing processes; Elements of heat transfer – heat transfer by conduction in solids, principles of heat flow in fluids, heat exchanger equipment.	
Assessment methods: Coursework/individual presentation/written test examination.	
Recommended reading: 1. Płaczek M., Filipczak G.: The internal materials prepared by lecturers 2. McCabe W.L., Smith J.C.: Unit Operations of Chemical Engineering, McGraw-Hill Chemical Engineering Series, 1976 3. Reynolds T.D., and Richards P.: Unit Operations and Processes in Environmental Engineering, PWS Publishing Company 1996 4. Hetsroni G.: Handbook of Multiphase Systems, New York, McGraw-Hill Book Co., 1986.	

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Course name: Selected Elements of Process Engineering	
Course code: M063	Form of class: Lecture, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 3	Number of hours per semester: 45
Language of instruction: English	
Name of the lecturer and contact information: Filipczak Gabriel, g.filipczak@po.opole.pl Płaczek Małgorzata, m.placzek@po.opole.pl	
Prerequisites: English (min B1 level), Fundamentals of mechanical or environmental and process engineering.	
Objectives of the course and learning outcomes: The aim of this lecture is to provide students with basic knowledge from the area of mechanical and heat transfer processes taking place in multiphase systems. The student learns the processes, their mechanism, and also becomes prepared for self-solving engineering tasks.	
Teaching program: Two-phase flow: nature and general application of multiphase flow processes, two-phase gas-liquid and liquid-liquid flow (flow patterns and pressure drop), three phase liquid-liquid-gas flow (flow patterns and pressure drop), multiphase fluids flow - transport in pipes; Two-phase heat processes: pool boiling and convective heat transfer - heat transfer mechanism, flow boiling and evaporation, heat transfer coefficient – the basic method for calculation, project and design exercises; Modelling of multiphase heat transfer processes: basic equations of two-phase flow, the homogenous and separated models, Practice and applications: heat boilers, evaporators.	
Assessment methods: Coursework/individual presentation/written test examination.	
Recommended reading: 1. Płaczek M., Filipczak G.: The internal materials prepared by lecturers 2. McCabe W.L., Smith J.C.: Unit Operations of Chemical Engineering, McGraw-Hill Chemical Engineering Series, 1976 3. Reynolds T.D., and Richards P.: Unit Operations and Processes in Environmental Engineering, PWS Publishing Company 1996 4. Hetsroni G.: Handbook of Multiphase Systems, New York, McGraw-Hill Book Co., 1986.	

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Course name: Mechanical Operations	
Course code: M064	Form of class: Lecture, Group tutorial, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Filipczak Gabriel, g.filipczak@po.opole.pl Pietrzak Marcin, m.pietrzak@po.opole.pl Placzek Małgorzata, m.placzek@po.opole.pl	
Prerequisites: English (min B1 level), Fundamentals of mathematics.	
Objectives of the course and learning outcomes: The aim of this course is to give the students a deeper introduction to the theory of mechanical operations such as sedimentation, mixing, filtration. The primary objective of this course is to identify the important physical mechanisms occurring in processes involving particles, discuss unit operation and its role in chemical industries, characteristics of particulate solids, principles of size reduction, particle dynamics and separation of particles, formulate and solve mathematical descriptions of such processes.	
Teaching program: Topics to be covered: 1. Characteristic of physical properties of solid particles, suspension. 2. The phenomenon of sedimentation- introduction. Clarification and centrifugal sedimentation. 3. Characteristic of filtration process: definition, mechanism of filtration, driving force of the process, constant-rate and constant-pressure filtration, application area of filtration processes, hot, cold and vacuum filtration, characteristic of filter media (material: woven material, perforated sheet metal, bed of granular solid built up on supporting medium, membrane filter media; surface and depth filter), filter aids, pressure drop across the filter medium, classification of filtration equipments, operation of filtration (continuous and discontinuous). Characteristic and operation parameters of selected filtration apparatuses: plate and frame filter press, rotary drum filter, pressure and sand filter, disc filter, centrifugal filtration. 4. Introduction to mixing process (theoretical background). Mixing in different systems (liquid-liquid, liquid-solid, gas-liquid-solid). Mixing induced by gas phase, liquid phase and mechanical agitators. Mixing mechanisms. Mixers design and operation parameters. Flow pattern during mixing (tangential, radial, axial flow). Characteristic of impellers. Creating a vortex and role of baffles. Role of mixing process in chemical, biochemical, food, pharmaceutical industries.	
Assessment methods: Lecture: test paper examination Exercise: active participation under the exercise, individual consultations, resolved task lists Seminar: active participation under the seminar, essay (10 pages) or oral presentation of set task, individual consultations.	
Recommended reading: 1. Materials prepared by lecturer. 2. McCabe W.L., Smith J.C and Harriott P., "Unit Operations of Chemical Engineering", 7th Ed., McGraw Hill, 2005. 3. Doran Pauline M.: Bioprocess engineering principles, 2nd ed. – Amsterdam, Elsevier, 2013, 919 s. 4. Najafpour Ghasem D.: Biochemical engineering and biotechnology, 2nd ed., Amsterdam, Elsevier, cop. 2015.	

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Course name: Bioprocess Engineering	
Course code: M065	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Płaczek Małgorzata, m.placzek@po.opole.pl	
Prerequisites: English (min B1 level), Fundamentals of mathematics, chemistry, biology.	
Objectives of the course and learning outcomes: The aim of this course is to provide the information about bioprocess engineering and indication of its important role for development of biotechnology industry. Moreover, the aim of this course is to provide the information about technical aspect of microorganisms cultivation especially those that are used industrially. Description of performance of typical biotechnology processes realized in a large scale, as well as design and ability to use of different bioreactor type. The course is designed to be a study of all aspects of practical application of microorganisms. Some part of the course is dealing with production of different substances in a biotechnological way (alcohols, organic acid, antibiotics, vitamins or cultivation of plant and tissue cells in bioreactors). Additionally, some information about environmental protection (wastewater treatment and bioremediation) will be also provided.	
Teaching program: 1. Introduction to bioprocess engineering (steps in bioprocess engineering development). 2. Comparison of chemical and biochemical ways of production. 3. Bioreactor design (type of bioreactor: stirred tank reactor, bubble column, airlift bioreactors, immobilized system, loop bioreactor; scale up of bioprocess, etc.). 4. Modes of operation of bioreactors (batch, fed batch, continuous). 5. Technical aspect of bioprocess realization (mixing, aeration, cooling, sterilization). 6. Kinetics of biomass growth (growth phases of cells, growth kinetics for batch, fed batch and continuous culture, biomass growth models). 7. Stoichiometry of cell growth and product formation (elemental balances, electron balances, biomass and product yields, theoretical oxygen demand). 8. Heat and mass transfer processes in bioreactor. 9. Enzyme technology (specific function, classification, enzymes act as catalysts, industrial application of enzymes, enzyme deactivation). 10. Upstream processing (screening of microorganism, preparation of culture media, inoculation) and downstream processing (solid-liquid separation processes, method of cell disruption and release of intracellular products, concentration, purification, drying and methods of final product formulation). 11. Application of fermentation processes (technology production of selected bioproducts). 12. Bioprocess engineering and environmental protection.	
Assessment methods: Lecture: test paper examination, Exercise: active participation under the exercise, individual consultations, resolved task lists or test paper examination.	
Recommended reading: 1. Materials prepared by lecturer. 2. Doran M.P.: Bioprocess Engineering Principles, Academic Press Limited, UK 2013. 3. Najafpour G.D.: Biochemical Engineering and Biotechnology, 2nd edition, Elsevier 2015. 4. Basic Biotechnology, Ratledge C., Kristiansen B., Cambridge University Press, 2006.	

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Course name: Engineering of Reactors	
Course code: M066	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Płaczek Małgorzata, m.placzek@po.opole.pl	
Prerequisites: English (min B1 level), Fundamentals of mathematics, chemistry.	
Objectives of the course and learning outcomes: The aim of this course is to give the information about the fundamentals of reaction equilibrium and kinetics. Characteristic of types and operational work conditions of different reactors used in chemical industry. Description of heat and mass transport processes in chemical reactors.	
Teaching program: 1.Introduction to engineering of chemical reactors. Evolution of the chemical process industries. Importance of multiphase reactors. 2.Fundamentals of reaction equilibrium and kinetics. Classification of chemical reactions. Multiple reactions (parallel and series reactions). 3.Types and fundamental properties of chemical reactors (Continuous Stirred-Tank Reactor (CSTR), Batch Reactor, Tubular Plug-Flow Reactor). 4.Mass balance for different types of chemical reactors. 5.Heat transfer in reactors. Energetic balance of ideal reactors. 6.Stationary and non-stationary state of chemical reactor. 7.Models of heterogeneous catalytic reactors. 8.Details of design and scale up aspects of several important types of multiphase reactors. 9.Optimization of chemical processes.	
Assessment methods: Test paper examination.	
Recommended reading: 1.Materials prepared by lecturer. 2.Schmidt, Lanny D., The Engineering of Chemical Reactions, New York, Oxford University Press, 1998. 3.Nauman, E. Bruce: Chemical Reactor Design, Optimization, and Scaleup, McGraw-Hill, 2002. 4.Pangarkar V.G.: Design of multiphase reactors, John Wiley	

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Course name: Design Work - Installation for Solution Production	
Course code: M067	Form of class: Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Pietrzak Marcin, m.pietrzak@po.opole.pl Placzek Małgorzata, m.placzek@po.opole.pl	
Prerequisites: English (min B1 level), Fundamentals of mathematics and process engineering.	
Objectives of the course and learning outcomes: The goal of this course is to give the students insight into the methodology that is used in process plant design and indicate on the important elements of design work. The aim of this course is to expose students to general engineering design work of special types of industrial installation related to calculation of fluid flows, mixing, selection of different elements of apparatuses equipment (piping and instrumentation) and finally preparation of engineering drawing of designed installation.	
Teaching program: Topics to be covered: 1.Determination of the medium properties (dynamic viscosity, density of particular liquids and mixture). 2.Storage tanks geometry and material determination. 3.Calculation of orifice size in bottom of the storage tank; determination of the pipeline diameter. 4.Selection of mixer type (geometry and material, type of stirrer, calculation of power demand for mixing). 5.Selection of equipment to the installation (flange to pipes, valves, bends, tees, bottoms to the tank, support for tanks and mixer). 6.Calculation of frictional, local, hydrostatic and finally total pressure drop, power and selection of proper pump. 7.Preparation of engineering drawing of designed installation.	
Assessment methods: Project: active participation under the project, individual consultations, written report including process calculation and engineering drawing of designed installation.	
Recommended reading: 1.Materials and tables prepared by lecturer. 2.McCabe W.L., Smith J.C.: Unit Operations of Chemical Engineering, 7 ed. McGraw-Hill Education, 2005. - 1140 s.	

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Course name: Design Work - Installation for gas cooling and humidification	
Course code: M068	Form of class: Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Pietrzak Marcin, m.pietrzak@po.opole.pl Placzek Małgorzata, m.placzek@po.opole.pl	
Prerequisites: English (min B1 level), Fundamentals of mathematics and process engineering.	
Objectives of the course and learning outcomes: The goal of this course is to give the students information about methodology used in process plant design and indicate on the main elements of engineering design work. The aim of this course is to expose students to general engineering design work of special kinds of installation. The project include: determination of fluid properties, fluid flows, calculation of heat transfer, geometry of heat exchanger and packed tower, pressure drop, selection of different elements of apparatuses equipment (piping and instrumentation) and finally preparation of engineering drawing of designed installation.	
Teaching program: Topics to be covered: 1. Determination of the medium properties (dynamic viscosity, density, specific heat). 2. Liquid storage tanks geometry and material determination. 3. Calculation of scrubber (diameter and high of scrubber, check on holdup, maximum gas velocity). 4. Selection of scrubber device (selection of type of liquid collector and redistributor, bed limiter, droplet separator, etc.). 5. Calculation of heat exchanger (heat transfer area, selection of heat exchanger type). 6. Selection of equipment to the installation (flange to pipes, valves, bends, tees, heads, support for particular apparatuses). 7. Calculation of frictional, local, hydrostatic and finally total pressure drop, power and selection of pump. 8. Preparation of engineering drawing of designed installation.	
Assessment methods: Project: active participation under the project, individual consultations, written report including process calculation and engineering drawing of designed installation.	
Recommended reading: 1. Materials and tables prepared by lecturer. 2. McCabe W.L., Smith J.C.: Unit Operations of Chemical Engineering, 7 ed. McGraw-Hill Education, 2005. 3. Bayazitolu Y., Özisik M. N.: Elements of heat transfer, McGraw-Hill, New York, 1988. 4. Frank P.: Fundamentals of Heat and Mass Transfer, 6th ed., Hoboken, NJ, John Wiley	

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Course name: Membrane Processes	
Course code: M069	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Pietrzak Marcin, m.pietrzak@po.opole.pl Płaczek Małgorzata, m.placzek@po.opole.pl	
Prerequisites: English (min B1 level), Fundamentals of mathematics.	
Objectives of the course and learning outcomes: The aim of this course is to provide the information about membrane separation processes, design and operating of membrane modulus. An indication of the role of these processes in realization of industrial processes and environmental protection.	
Teaching program: 1. Introduction to the separation processes. Fundamentals of membrane processes: theory, definitions, the base of separation mechanism. Types of membrane processes (ultrafiltration, microfiltration, reverse osmosis, dead-end filtration, cross-flow filtration, hybrid flow filtration). 2. Classification and proprieties of membranes (materials and material properties). Preparation of synthetic membranes. Flat and tubular membranes. 3. Mechanisms of mass transport in membrane processes. 4. Disadvantageous phenomena in membrane processes (e.g. fouling, scaling, Donnan effect). 5. Membrane processes in environmental protection. Membranes in bioreactors and hybrid processes. 6. Characterization of membrane processes with the engineering and economic aspects of device performance, device and module design.	
Assessment methods: Test paper examination.	
Recommended reading: 1. Materials prepared by lecturer. 2. Rautenbach R., Albrecht R.: Membrane process, Wiley	

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Course name: Process Flow Systems	
Course code: M070	Form of class: Lecture, Group tutorial, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Filipczak Gabriel, g.filipczak@po.opole.pl Pietrzak Marcin, m.pietrzak@po.opole.pl Placzek Małgorzata, m.placzek@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level), Fundamentals of fluid mechanics, Process engineering.	
Objectives of the course and learning outcomes: The aim of this course is to give the students information about process flow systems including characteristic of fluids, calculation of pressure drop in pipeline, types of pumps description, procedure of pump selection for installation.	
Teaching program: Topics to be covered: 1. Definitions and fundamentals of fluids rheology. (Newtonian and non-Newtonian fluids, thixotropic behaviors). Characteristic and examples. The viscosity of newton and non-newton fluids. Types of boundary layer. 2. The pressure drop. Calculation of pressure drop in pipeline (frictional, local and hydrostatic pressure). Loss coefficients for pipeline components. 3. Common pump types. System characteristics and pump total head. Pump's selection criteria (best efficiency point). Pumping systems (pumps in parallel and serial connection). 4. Cavitation phenomena.	
Assessment methods: Lecture: test paper examination Exercise: active participation under the exercise, individual consultations, resolved task lists Seminar: active participation under the seminar, essay (10 pages) or oral presentation of set task, individual consultations.	
Recommended reading: 1. Materials prepared by lecturer. 2. White F.M.: Fluid Mechanics, McGraw-Hill, 1999. 3. Kolev N.I.: Multiphase Flow Dynamics Vol. 1, 2, Berlin, Springer-Verlag, 2015.	

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Course name: Extraction	
Course code: M071	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Pietrzak Marcin, m.pietrzak@po.opole.pl	
Prerequisites: English (min B1 level), Fundamentals of mathematics, chemistry and process engineering.	
Objectives of the course and learning outcomes: The aim of this study is to provide information on extraction process, building extraction columns, their proprieties, activity, and use in industrial processes. Moreover, the aim of this course is to introduction to basic problems of performance of typical technology processes on a large scale, as well as introduction to different extraction types.	
Teaching program: - A Fundamentals of solvent extraction - Liquid-liquid extraction - phase equilibrium - Prediction of distribution - Choice of solvent - Gibbs principle - Diffusion and mass transfer for extraction - Methods calculation (graphical methods, mass-transfer method, short-cut methods) - Extraction equipment (mixer-settlers, column contractors, centrifugal extractors, membrane extractors) - extractor design (rules of thumb) - Liquid-extraction processes.	
Assessment methods: lecture: active participation under the lecture and exercise exercise: active participation under the exercise, individual consultations.	
Recommended reading: 1.Hanson C.: Recent Advances in Liquid-Liquid Extraction, Elsevier, 1971. 2.Rydberg J.: Solvent extraction Principles and Practice. Secend Edition. Revised and Expanded, World Wide Web, 2004. 3.Kislik V.S.: Solvent extraction. Classical and Novel Approaches, Elsevier, 2012.	

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Course name: Distillation and Rectification	
Course code: M072	Form of class: Lecture, Group tutorial, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 4	Number of hours per semester: 60
Language of instruction: English	
Name of the lecturer and contact information: Pietrzak Marcin, m.pietrzak@po.opole.pl	
Prerequisites: English (min B1 level), Fundamentals of mathematics, chemistry and process engineering.	
Objectives of the course and learning outcomes: The aim of this study is to provide information on distillation and rectification, building distillation and rectification columns, their properties, activity, and use in industrial processes. Moreover, the aim of this course is to introduction to basic problems of performance of typical technology processes on a large scale, as well as introduction to construction of different columns types. The course is designed to be a study of all aspects of practical application of distillation and rectification.	
Teaching program: - A Fundamentals - Vapour - Liquid equilibrium - Binary mixtures - Ternary mixtures - Empirical findings in vapour - liquid equilibrium - Empirical laws of vapour - liquid equilibrium - Continuous distillation - Continuous distillation of binary mixtures - Continuous distillation of multicomponent mixtures - Batch distillation - Batch distillation of binary mixtures - Batch distillation of multicomponent mixtures - Semicontinuous distillation - Semicontinuous distillation of binary mixtures - Semicontinuous distillation of multicomponent mixtures - Continuous rectification (multiple distillation) - Rectification of binary mixtures - Rectification of ternary mixtures - Rectification of multicomponent mixtures - Batch rectification - Industrial rectification processes - Design and dimensioning of mass-transfer equipment - Types of construction - Plate columns - Packed columns - Dimensioning of plate columns - Dimensioning of packed columns - Calculation of continuous distillation - Calculation of batch distillation - Calculation of continuous rectification - Calculation of batch rectification - Calculation of mass transfer in packed columns - Rectification columns design, optimization, and scale up.	

Assessment methods:

Lecture: active participation under the lecture and exercise

Exercise: active participation under the exercise, individual consultations,

Project: study of rectification column design.

Recommended reading:

1. Bagaturov S.A.: Multicomponent distillation and rectification, Asia Pub. House, London 1968.

2. Krister H.: Distillation operation, McGraw-Hill Book-mart Press, 1990.

3. Smith C.: Distillation control: An engineering perspective, McGraw-Hill Book-mart Press, 2012.

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Course name: Sustainable Development for Engineers	
Course code: M073	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kłosok-Bazan Iwona, i.klosok-bazan@po.opole.pl	
Prerequisites: English (min B1 level),	
Objectives of the course and learning outcomes: Basic terms connected with Sustainable Development rules implementation.	
Teaching program: Why sustainability is so important. Sustainable Development in practice. Sustainability indicators. Measuring sustainability. Environmental hazards and squandering resources. Environmental Impact Assessment. Integrated Product Policy (LCA) - part I. Integrated Product Policy (LCA) - part II. Sustainable development in the company. Economic aspects of Sustainable Development. Sustainable Development and innovation process. Environmental aspects of innovation and new technology transfer.	
Assessment methods: Reports.	
Recommended reading: 1.De Las Heras A., (2014) Sustainability Science and Technology: An Introduction CRC Press, 2.Allenby B.R. (2012) The Theory and Practice of Sustainable Engineering Pearson (Prentice Hall) 3.Azapagic A., Perdan S. (2011) Sustainable Development in Practice: Case Studies for Engineers and Scientists 2nd Edition Wiley.	

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Course name: Spatial Planning and Urban Design	
Course code: M074	Form of class: Lecture,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Wydrych Jacek, j.wydrych@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: The subject extends knowledge from fields of study of land-use planning and urbanism and is optional in terms of academic specialization in regional economy and public administration. The purpose of the course is to develop a deeper understanding of the processes and actors which determine urban and regional development, and how these affect planning practice. After completing the course, the student shall be able to evaluate and critically analyse planning practice in Poland, Europe and elsewhere.	
Teaching program: - Spatial conjunctions of society development (space and time like essential entities and progress parameters of human society; historical development, current situation and evolutionary tendency in global, national and regional criteria, especially in central Europe, spatial consequences of globalization) - Settlement of Poland (structure of residential system, mutual relations of seats; town-planning and building structure of seats, use of territory; international confrontation, especially with neighbouring states; settlement changes in conditions) - Settlement system and towns theory (urbanization, suburbanization, des-urbanization, re-urbanization) - Typology of town agglomerations and towns in Europe and in Poland (factor affecting settlement and town development; tools for purposeful interaction development of municipal system and towns; resident axis and centre seats, "network of towns"; relation between towns and its background) - Function of towns, functional, town-planning and building structure of towns (town like grown organism; urban analysis of towns; zoning and draft "towns of short routes"; town-planning structure of contemporary big towns in Poland and parameters of their parts, morphology of towns) - Characteristic of the main functional components of towns and their mutual connections (a town like place of residence and workplace, resting-place and recreation, centre of administration, culture and education and their operational and town-planning connections) - Characterization of "technical" components of towns" (technical infrastructure, traffic roads and arrangements, telecommunication) - Rural space and rural seats and landscape (typology of rural space and rural seats and their functional, town-planning and building characteristics, structure of land and changes in its arrangements and use) - Land-use planning like instrument of regulation development, arranging seats and land and relation to other territorial relevant kinds of planning (relation to territorial planning and developing programs on level of regions and municipalities; territorial connections developing plan corporations and institutions; land-use planning and landed modifications; land-use planning and branch planning - in sector of agriculture and wood economy, transport and technical infrastructure, living and civic equipments and services) - Systematics spatially relevant planning in European union - divergences of spatial planning in Germany and France and land-use planning in Poland, territorial basic informations for cross-border cooperation; information system and land-use planning).	
Assessment methods: Formal assessment includes a Mid-Term Test and a Final Test. Both these tests are comprehensive and cover the entire course material up to that date, from lectures and readings.	
Recommended reading: All readings will be scanned into the course. If students are unhappy with the quality of scans then they are advised to purchase the texts below. 1. Gindroz R. The Urban Design Handbook: Techniques and Working Methods, Norton	

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Course name: Basics of Business Entities of Economy	
Course code: M075	Form of class: Lecture,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Kuczuk Anna, a.kuczuk@po.opole.pl	
Prerequisites: English (min B1 level), The basics of entrepreneurship, decision-making principles.	
Objectives of the course and learning outcomes: Introduction to basics and consolidation of fundamental notions and rights in scope of micro-and macroeconomics and fundamentals of economic account.	
Teaching program: Fundamentals of economics notions- rarity effect, problem of management, goods and services, resources; Market, price, demand, supply- market structure, market mechanism, market balance; Consumer's decisions- rules of consumer decisions, usability theory; Producer's decisions - production's function, costs; Market structures- perfect rival ship, full monopoly, non-perfect rival ship; Chosen aspects of economic account - Investments efficiency, cash-flow, discount, NPV, IRR; Job market, capital market, ground market; Macroeconomics introduction; Circulation of product and income , ways of Groos National Income measurement; Aggregated supply and demand, macroeconomics balance; Unemployment, kinds of unemployment; Inflation- kinds, reasons, measures; Economy cycle, cycles of economic situation; Fiscal policy; Money in economy.	
Assessment methods: Written or oral test.	
Recommended reading: 1.Begg D., Dornbush R., Fisher S., Economics, subsequent editions; 2.Curtis D., Irvine I., Microeconomics: Markets, Methods and Models, Lyryx 2014; 3.Blachard O. Stanley F., Lectures on macroeconomics, MIT Press, 1989.	

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Course name: Organization of Agricultural Production and Services	
Course code: M076	Form of class: Lecture, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Kuczuk Anna, a.kuczuk@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of economy, management, plant and animal production.	
Objectives of the course and learning outcomes: Assimilation and consolidation of fundamental notions and rights in scope of agricultural production organization, economic account and services connected with agriculture.	
Teaching program: Fundamental notions used in organization and economics agriculture. Characterization of production factors and farming resources. Production process in agriculture - basis categories of production, divisions and production s branches, productions activity in farm, specification of agricultural production intensity, specialization of production. Fundamental organization-economics notions of plant production - meaning and specificity of crop production, structure of agricultural lands and sowing, harvest and yields, crop-rotation, fertilization. Farm territory - calculation of factors of fields shape. Organization of agricultural land - counting of agricultural lands structure and structure of total area, measure of soil quality; counting and analysis of sowing structure, share of plants making the soil more fertile; counting of intensity of crop production; study of crop-rotation, qualification of fertilization level. Fundamental organization-economics notions of animal production livestock population, rotation of herd, preliminary and balance of manure, preliminary and balance of fodder, intensity of animal production - Counting of example of livestock rotation, preliminary of fodder and manure balance; Economics and organization of work in agriculture - kinds of work, rules of rational work organization - Counting of work resource in farm. Agricultural services - agricultural services organization, agricultural market. Farm economic account - profits, direct and indirect costs.	
Assessment methods: Project paper and presentation.	
Recommended reading: 1. Debertin D.L., Agricultural Production Economics: The Art of Production Theory. CreateSpace Independent Publishing Platform, 2012 2. Rane A.A., Deorukhkar A., C., Atlantic Publishers	

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Course name: Final project	
Course code: M077	Form of class: Project, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 15	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Borsuk Grzegorz, g.borsuk@po.opole.pl Filipczak Gabriel, g.filipczak@po.opole.pl Ligus Grzegorz, g.ligus@po.opole.pl Pietrzak Marcin, m.pietrzak@po.opole.pl Płaczek Małgorzata, m.placzek@po.opole.pl Pochwała Sławomir, s.pochwała@po.opole.pl Spyra Andrzej, a.spyra@po.opole.pl Tańczuk Mariusz, m.tanczuk@po.opole.pl Wydrych Jacek, j.wydrych@po.opole.pl Wzorek Małgorzata, m.wzorek@po.opole.pl	
Prerequisites: English (min B1 level), The general knowledge of study area and ability to individual work.	
Objectives of the course and learning outcomes: Project theme is linked to knowledge of the some chosen elements of Mechanical Engineering or Environmental Engineering as well as Process Engineering programmes, especially related to fluids mechanics of one- and multiphase flows and heat and mass transfer processes.	
Teaching program: Teaching program - main areas of the final project: a) Processes taking place in multiphase systems (M. Płaczek PhD, G. Filipczak assoc. prof.) b) Heat and mass transfer processes design (M. Płaczek PhD, M. Pietrzak PhD) c) Flow measurements in fluids mechanics (S. Pochwała PhD) d) Computational fluids mechanics (G. Borsuk PhD, J. Wydrych PhD) e) Informatics in fluids mechanics (J. Wydrych PhD eng.) f) Hydraulics and hydrodynamics (A. Spyra PhD eng.) g) Computer image analysis in environmental engineering (G. Ligus PhD eng.) h) Waste to energy (M. Wzorek Assoc. prof.)	
Assessment methods: Individual elaboration	
Recommended reading: - according to the area of realized final project	

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Course name: Disabled sports	
Course available with minimum number of 4 participants.	
Course code: F01	Form of class: Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Rutkowski Sebastian, s.rutkowski@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level)	
Objectives of the course and learning outcomes: The aim of the course is to acquaint students with problems and the theory of sports of disabled people. Practical classes will introduce paralympic games and prepare students to work with disabled people. Disabled sports are sports played by persons with a disability, including physical and intellectual disabilities.	
Teaching program: The course covers theoretical and practical parts. Practical part include the observation of and participation in sports activities for persons with damaged sight organ, for persons with impaired hearing organ, after amputation and for persons who are intellectually impaired to a moderate and considerable degree . Discussing each of the games will be explained the rules, classification, the scores of players, tactics, equipment requirements, course of the game. Goalball Boccia Sitting volleyball Wheelchair Rugby Wheelchair Basketball Powerlifting Paralympic swimming Archery Athletics	
Assessment methods: practical classes assessment	
Recommended reading: Lecture notes Karen DePauw, Susan Gavron. Disability Sport Ronald Davis. Teaching Disability Sport John M. Dunn, Carol Leitschuh. Special Physical Education	

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Course name: Kinesiotaping	
Course available with minimum number of 4 participants.	
Course code: F02	Form of class: Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Rutkowski Sebastian, s.rutkowski@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level)	
Objectives of the course and learning outcomes: Upon completion of this course, Including the lecture, demonstration and practical, the student will be able to: Explain and apply the concepts of the Kinesio Taping Method. Describe the unique qualities of the tape Understand the principles of tape application. Apply a time-efficient method to decrease muscle spasm, pain and swelling. Apply various taping techniques for treatment of the spine and upper / lower extremity dysfunction.	
Teaching program: Students are acquainted fundamental concepts of the Kinesiotaping method and the unique properties and use of Kinesio tape to practice muscle applications for the upper and lower limbs, trunk, back and neck. Students will be able to apply the Kinesiotaping method to relax overuse syndromes, stimulate weak muscles and decrease pain and swelling. Describe the various cutting techniques and their clinical applications. Corrective Taping Techniques: Mechanical Correction Fascia Correction Space Correction Ligament/Tendon Correction Functional Correction Lymphatic Correction	
Assessment methods: practical classes assessment	
Recommended reading: 1. Kenzo Kase, Jim Wallis, Tsuyoshi Kase. Clinical Therapeutic Applications of The Kinesio Taping Method Book 2. John Gibbons. A practical guide to Kinesiology Taping 3. John Langendoen. Kinesiology Taping The Essential Step-By-Step Guide 4. Lecture notes	

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Course name: Prosthetics and Orthotics	
Course available with minimum number of 4 participants.	
Course code: F03	Form of class: Seminar,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Rutkowski Sebastian, s.rutkowski@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level)	
Objectives of the course and learning outcomes: The semester course of studies combines lectures and classes on the role of orthopedic subjects in rehabilitation, especially as a remedy in physiotherapy. The aim is to acquaint students how to recognize patient problems, assess individual needs, design and construct appliances, fit the device and adjust to the individual patient. Structure and function of prosthetic appliances, repairs and maintenance. Select appropriate materials and deal with the emotional difficulties of patients. Arrangements for orthopedic supply, recognition, distribution and payment.	
Teaching program: Amputations, levels of amputations and their consequences upper limb prosthesis- role, importance, types of prostheses, power source characteristics of various models lower limb prosthesis - role, importance, types of prostheses, power source characteristics of various models upper limb orthoses - definition, tasks, the reasons for the use of orthoses, the use of orthoses of injuries and their complications, congenital defects and abnormal limb axis, osteoarthritis, rheumatoid disease, neural dysfunctions and other diseases lower limb orthoses - as above verticalization equipment.	
Assessment methods: Individual project presentation	
Recommended reading: Lecture notes Bella J. May, Margery A. Lockard. Prosthetics	

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Course name: Adaptive Physical Activity	
Course available with minimum number of 4 participants.	
Course code: F04	Form of class: Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Rutkowski Sebastian, s.rutkowski@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level)	
Objectives of the course and learning outcomes: This module aims to develop the student's knowledge and understanding of current concepts, trends and research findings pertinent to adapted physical activity and sport. The role of adapted physical activity and sport as a Means of meeting the needs of Individuals with disabilities will be discussed and current strategies and programs' will be highlighted. A student passing this module should be able to: understand and analyze specific terms, principles, and laws related to disability, adapted physical activity and sport; analyze and appreciate the physical activity and sport needs of individuals with disabilities.	
Teaching program: Specificity for active blind and partially sighted - examples of Activities, exercise adaptation and compensation, tours, activity daily living Specificity the activity of the Spinal Cord Injury, principles of teaching, examples activity, exercise adaptation and compensatory activities of daily living, learning to ride a wheelchair, balance and overcome obstacles in a wheelchair. Specificity activity amputees upper limbs - adaptation to perform activities of daily living, hobbies, recreation and tourism. Specificity the activity of the lower limb amputation - adaptation to perform activities of daily living, learning locomotion and overcome obstacles with the help of the elbow crutches, examples of activities and recreation.	
Assessment methods: Group project presentation	
Recommended reading: 1. Lecture notes 2. Joseph Winnick, David Porretta. Adapted Physical Education and Sport 3. Robert Steadward, Garry D. Wheeler, E. Jane Watkinson. Adapted Physical Activity 4. Susan Kasser, Rebecca Lytle. Inclusive Physical Activity	

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Course name: Clinical Physiotherapy in Neurology	
Course available with minimum number of 4 participants.	
Course code: F05	Form of class: Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Rutkowski Sebastian, s.rutkowski@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level)	
Objectives of the course and learning outcomes: The course allows to acquaint students with techniques and methods used in physiotherapy in neurology of adults patients	
Teaching program: Students are acquainted with issues related to patient history, discuss problems, presentation of work with patients. Issues to be covered also includes: examination of the patient for the purpose of neurology rehabilitation - sensory testing, muscle tension, cognitive disorders, disorders of the body schema Introduction to the Bobath concept - origins of the concept, aim, clinical reasoning, principles of implementation Stimulation of the hand and foot by the concept of Bobath - explanation of utility, purpose, importance and practical learning discuss the process of verticalization	
Assessment methods: Group project report	
Recommended reading: 1. Lecture notes 2. Sue Raine, Linzi Meadows, Mary Lynch-Ellerington. 3. Bobath Concept: Theory and Clinical Practice in Neurological Rehabilitation 4. Bente Bassoe Gjelsvik. Bobath Concept in Adult Neurology Susan Edwards MCSP. Neurological Physiotherapy: A Problem-Solving Approach	

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Course name: Practical Training	
Course code: F06	Form of class: Group tutorial,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 5	Number of hours per semester: 75
Language of instruction: English	
Name of the lecturer and contact information: Łuniewski Jacek, j.luniewski@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Practice takes place in a hospital - rheumatology ward. The student is able to provide physiotherapy care, advice on the health related mode of life for patients with rheumatic disease, applies ethical rules with these patient, with their families, with his nearest environment and society.	
Teaching program: Students use their knowledge in practical action in direct work with patients under the supervision of a qualified therapists. Student performs physical therapy techniques, therapeutic exercises, massage techniques, physical modalities and other physiotherapy methods. All actions are adapted to the patient's condition and stage of the disease. The student learns to conduct medical records and data.	
Assessment methods: Practical assessment	
Recommended reading: No recommended reading for practical training	

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Course name: Functional Diagnostics and Rehabilitation Programming in Rheumatology	
Course available with minimum number of 4 participants.	
Course code: F07	Form of class: Seminar,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Łuniewski Jacek, j.luniewski@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level)	
Objectives of the course and learning outcomes: The course allows to acquaint students with techniques and methods used in diagnostic and rehabilitation programming in neurology of adults patients.	
Teaching program: Basics of programming the rehabilitation process, controlling its course and adapting the physiotherapeutic treatment to the aims of complex rehabilitation. Selection of physiotherapeutic procedures and methods appropriately for clinical recognition. Results control, keeping documentary. Planning and conduct physical therapy for patient with osteoarthritis. Planning and conduct physical therapy for patients with systemic connective tissue disease during exacerbations and remissions. Seronegative spondyloarthropathies: planning and carrying out a comprehensive medical rehabilitation proceedings. Repetition of acquired practical skills in the treatment of patients with rheumatic diseases. Assessment of planning and conducting a physical therapy session with a patient with a rheumatic disease.	
Assessment methods: Group project report	
Recommended reading: Karen Jones Neurological Assessment. Janet Carr. Neurological Rehabilitation : Optimizing motor performance Raj Gladly Samuel. Physiotherapy in Neuro-conditions	

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Course name: Therapeutic Massage	
Course code: F08	Form of class: Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Łuniewski Jacek, j.luniewski@po.opole.pl	
Prerequisites: English (min B1 level), Knowledge of anatomy and physiology	
Objectives of the course and learning outcomes: The subject programme introduces knowledge from range of massage theory and practical skills. Students are expected to explain theoretical basis of therapeutic massage, demonstrate the steps in preparing a room and patient for a massage session, give and adjust dosage of therapeutic massage.	
Teaching program: Physiological basis of therapeutic massage, massage mechanism of action, key concepts, terms and conditions. Ethics, work organization. Effect of massage on the human body, indications and contraindications for the massage. Technique and methodology of therapeutic massage on each area of the human body (upper limb, lower limb, low back area, the area of the neck, chest and abdomen). Types and varieties of massage (technique and methodology): segmental massage, spot, isometric massage, lymphatic massage. Therapeutic massage in different clinical situation.	
Assessment methods: Practical examination	
Recommended reading: 1. Beck M.: Theory and practice of therapeutic massage, 5th edition, Cengage Learning 2010 2. Hollis M. Jones E.: Massage for therapists. Wiley-Blackwell, 1998 3. Muscolino J.E.: The muscle and bone palpation manual with trigger points, referral patterns and stretching. Elsevier Health Sciences, 2014	

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Course name: Adapted Sport and Recreational Physical Activity	
Course code: F09	Form of class: Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Stefaniak Wojciech, w.stefaniak@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Acquire practical knowledge about adaptation of sport and recreational activities in different disabilities.	
Teaching program: Sport and recreation as an important part of rehabilitation. General rules for adaptation of physical activity for physical and sensorial disabled. Daily, recreational and sport activities on wheelchair and for amputees. Daily, recreational and sport activities for visual disabled. Rules for adaptation of activities for auditory disabled.	
Assessment methods: Individual or group project paper, individual or group project presentation, practical classes assessment	
Recommended reading: 1.Keith Gilbert, Otto Schantz: The Paralympic Games: Empowerment Or Side Show?: Meyer	

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Course name: Clinical Reasoning and ICF Model Based Rehabilitation	
Course code: F10	Form of class: Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Stefaniak Wojciech, w.stefaniak@po.opole.pl	
Prerequisites: English (min B1 level), Anatomy and functional anatomy, physiology	
Objectives of the course and learning outcomes: Acquire basic knowledge and skills for clinical reasoning in rehabilitation.	
Teaching program: The teaching classes are provided by following theme structure: 1. ICF model. 2. Assessment and evaluation of patient. 3. Data analysis. 4. Environmental factors. 5. Treatment planning. 6. Outcome measurements. 7. Evidence based rehabilitation.	
Assessment methods: paper test examination, individual presentation, practical classes assessment	
Recommended reading: 1. International classification of functioning, disability and health (ICF), WHO 2001 2. Anne Shumway-Cook, Marjorie H. Woollacott: Motor Control, Translating Research into Clinical Practice: Lippincott Williams	

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Course name: Neurorehabilitation	
Course code: F11	Form of class: Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: October, February
Number of hours per week: 3	Number of hours per semester: 45
Language of instruction: English, Spanish	
Name of the lecturer and contact information: Stefaniak Wojciech, w.stefaniak@po.opole.pl	
Prerequisites: English (min B1 level), Anatomy, physiology, movement therapy	
Objectives of the course and learning outcomes: Acquire teoretical and practical basic tools for evaluating and treatment planing of neurological patient.	
Teaching program: The program consist of following themes: 1. Normal and abnormal movement (motor control, postural control, movement analysis, environmental factors). 2. Assesment and evaluation in neurorehabilitation. 3. ICF model. 4. Facilitation of ADL activities. 5. Task oriented therapy. 6. Constraint induced movement therapy. 7. Treatment progression - taxonomy of tasks. 8. Orthotics. 9. Outcome measurements.	
Assessment methods: paper test examination, individual presentation, practical classes assessment	
Recommended reading: 1. Janett Carr, Roberta Shepherd: Neurological Rehabilitation, Optimazing Motor Performance: Churchill Livingstone Elsevie 2010 2. Anne Shumway-Cook, Marjorie H. Woollacott: Motor Control, Translating Research into Clinical Practice: Lippincott Williams	

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Course name: Orthopaedic and Sport Rehabilitation	
Course code: F12	Form of class: Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: October, February
Number of hours per week: 3	Number of hours per semester: 45
Language of instruction: English	
Name of the lecturer and contact information: Stefaniak Wojciech, w.stefaniak@po.opole.pl	
Prerequisites: English (min B1 level), Anatomy and functional anatomy, physiology, movement therapy.	
Objectives of the course and learning outcomes: Acquire theoretical and practical basic tools for diagnosis and treatment planning in the field of orthopaedic and sport rehabilitation.	
Teaching program: The teaching is led by following themes structure: 1. Postural control and motor control. 2. Normal and pathological movement analysis. 3. Trauma and its implications. 4. General approach in acute stage of injury. 5. Orthopaedic examination. 6. General approach in subacute and chronic stage of injury. 7. Common pathologies of ankle, knee, hip, shoulder, elbow, wrist and hand. 8. Treatment in selected pathologies of lower and upper limb. 9. Treatment planning. 10. Prevention and long term care. Orthotics.	
Assessment methods: Paper test examination, individual presentation, practical classes assessment.	
Recommended reading: 1. Ludwig Ombregt: A System of Orthopaedic Medicine: Elsevier Health Sciences, 2013 2. Bruce C. Reider, George J. Davies, Matthew T. Provencher: Orthopaedic Rehabilitation of the athlete: 3. Christer Rolf: The Sports Injuries Handbook, diagnosis and management: A	

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Course name: Human motion analysis in physiotherapy practice	
Course code: F13	Form of class: Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 2	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English, Spanish	
Name of the lecturer and contact information: Stefaniak Wojciech, w.stefaniak@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level), Spanish (min B1 level)	
Objectives of the course and learning outcomes: Student is able to describe human motion in different ways in relation to gravity force, task and environment.	
Teaching program: 1.Describing movements in human body 2.Movement is result of interaction individuum, task and environment 3.Forces acting on human body 4.Different ways of motion analysis 5.Human motion analysis in assessment of human behaviour 6.Motion analysis in daily practice	
Assessment methods: Project, Oral examination	
Recommended reading: 1. Anne Shumway-Cook, Marjorie H. Woollacott: Motor Control, Translating Research into Clinical Practice: Lippincott Williams 2. Janett Carr, Roberta Shepherd: Neurological Rehabilitation, Optimazing Motor Performance: Churchill Livingstone Elsevie 2010	

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Course name: Lymphatic drainage	
Course code: F14	Form of class: Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: October
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Rutkowska Anna, a.rutkowska@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level)	
Objectives of the course and learning outcomes: The student will be prepared to conduct manual lymphatic drainage	
Teaching program: •Anatomy Of The Lymphatic System, Insufficiency Of The Lymphatic System. Pathophysiology Of Edema. Transport Of Lymphatic System.Kinds Of Edema (Swelling With Low Protein Content – Transudate. Swelling With A High Content Of Protein- Exudate, Lymphedema).Characteristics Of Lymphoedema. Consequences Of Lymphedema.Treatment Of Lymphedema (Manual Lymphatic Drainage, Compression: Wrapping , Compression Garment , Pneumatic Compression , Hygiene Of The Skin, Exercises With Limb Compression ,Elevation Position Of The Limbs).Indications And Contraindications For The Use Of Mdl And Comprehensive Resealing Therapy. The Basic Principles Of Mdl-Grips. •Practical Classess. Methods Of Manual Lymphatic Drainage.	
Assessment methods: Group project report, practical classess assessment	
Recommended reading: Wittlinger Hildegard. Dr. Vodder's Manual Lymph Drainage French Ramona Moody. Complete Guide to Lymph Drainage Massage Foldi Professor Dr. Michael. Foundations of Manual Lymph Drainage	

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Course name: Physiotherapy in gynecology and obstetrics	
Course code: F15	Form of class: Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Rutkowska Anna, a.rutkowska@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level)	
Objectives of the course and learning outcomes: The student will be prepared to conduct manual lymphatic drainage	
Teaching program: Physiotherapy during pregnancy, physiotherapy in the puerperium, physiotherapy after cesarean section. Low back pain during pregnancy and after puerperium. (Massage, kinesiotaping applications, manual therapy treatments and prevention) The role of pelvic floor muscle during pregnancy after childbirth and in incontinence problem. Training of pelvic floor muscle. Physiotherapy in the separation of the rectus abdominal muscle. Role of physiotherapy during lactation problems. Indication and contraindication for massage during pregnancy. Physiotherapy after cesarean section. Scar mobilization. Physiotherapy after mastectomy.	
Assessment methods: Group project report	
Recommended reading: Llewellyn - Jones Derek, Fundamentals of Obstetrics and Gynaecology. Rost Cecile C. M. Relieving Pelvic Pain During and After Pregnancy Curtis Dr Glade B M.D. Rost Cecile C. M. Relieving Pelvic Pain During and After Pregnancy	

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Course name: Physiotherapy in oncology	
Course code: F16	Form of class: Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Rutkowska Anna, a.rutkowska@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level)	
Objectives of the course and learning outcomes: The student will be prepared to conduct manual lymphatic drainage	
Teaching program: Symptoms Of Cancer (Lung Cancer, Breast Cancer, Colon Cancer, Stomach Cancer And Prostate Cancer), Practical Application Of Therapeutic Methods In Selected Disease Entities And Clinical Problems In Physiotherapy In Oncology: Therapy Of Trigger Points, Pir, Lymph Drainage, Thera-Band Training Strengthening Muscle Strength, Modern Breathing And Relaxation Exercises. Breast Cancer (Risk Factors, Diagnosis, Prevention, Breast Exams, Breast Cancer Treatment, Types Of Mastectomy) Physical Consequences Of Mastectomy Psychological Consequences Of Mastectomy Rehabilitation After Mastectomy (The Aim Of Physiotherapy, Physiotherapy Before Surgery, Physiotherapy After Surgery (0-3 Day), Prevention Of Complications Of Circulatory, Prevention Of Respiratory Complications, Prevention Of Deep Vein Thrombosis, Physiotherapy After Hospital (4-5 Day), Physiotherapy In The Late Outpatient – Sanatorium) Scar Greater Flexibility And Range Of Motion To Restore The Operated Limb. Improving Lymph Drainage. Improving Mental State And Relax. Physiotherapy Treatment Of Lymphedema –Practical Classess	
Assessment methods: Group project report	
Recommended reading: Stephen J. Withrow	

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Course name: Alternative diagnostics and therapeutics methods in physiotherapy	
Course code: F17	Form of class: Seminar,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Skomudek Aleksandra, a.skomudek@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level)	
Objectives of the course and learning outcomes: Student can name, characterize and evaluate unconventional methods in physiotherapy	
Teaching program: 1. Basic concepts and principles of craniosacral therapy. 2. Craniosacral therapy, application and therapy. 3. Basic concepts and principles of visceral osteopathy. 4. Visceral osteopathy, application and therapy. 5. Phytotherapy 6. Cold, warm and cold-blooded cold as a form of diagnosis of the body's reactivity to stimulation. 7. Diagnostic and therapeutic methods of Chinese Medicine used in physiotherapy.	
Assessment methods: individual/group project paper report and/or presentation	
Recommended reading: 1. A Practical Guide to Biodynamic Craniosacral Therapy. Cranial Intelligence. Ged Sumner, Steve Haines 2. Visceral Manipulation in Osteopathy. Eric U. Hebgen 3. Lecture notes	

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Course name: Marketing	
Course code: TR01	Form of class: Group tutorial, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Hołodnik Daria, d.holodnik@po.opole.pl	
Prerequisites: English (min B1 level), Basics of Marketing, Basics of Communication and Negotiations	
Objectives of the course and learning outcomes: This course focuses on developing skills and competency in the core functions in the process of management: planning, organizing, directing, motivating, controlling. Students are required to use tools and instruments to solve problems in the organizations. They are also expected to deal with knowledge of specific procedures within the management function. The course provides an overview on activities aimed at effective use of human teams and material means taken to achieve its objectives.	
Teaching program: The program is led by following themes structure: - Basics concepts of marketing - Marketing environment - Marketing mix - Consumers on the market - Segmentation, marketing instruments - Product, price, place, promotion - Marketing strategy	
Assessment methods: Written examination, practical classes assessment.	
Recommended reading: 1. Ph. Kotler, G. Armstrong, Principles of marketing, Global Edition, 14/E, Pearson Higher Education, 2012 2. Gary Armstrong, Philip Kotler, Marketing : an Introduction /. - 7th ed. - Upper Saddle River : Prentice-Hall, 2005. 3. Lecture notes.	

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Course name: Tour Guiding	
Course code: TR02	Form of class: Group tutorial, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Hołodnik Daria, d.holodnik@po.opole.pl	
Prerequisites: English (min B1 level), Basics of Tourism	
Objectives of the course and learning outcomes: Methodical knowledge about guiding a tourist group. Organizational knowledge about tourist events. Social and psychological approaches for guiding tourist group	
Teaching program: Competition specification needed for working as a guide The profile competence specification for working as a tourist guide (in regard to: low system in EU, recruitment process in travel agencies, personal continuous improvement). Organizational aspects of guiding bus and airplane tourist group. Constructing announcements to the tourist group during standard and accidental situations. Planning the information and knowledge diffusion while having city guiding. Determinants of successful guiding in context of tourist relationship management. Modern technics of interactive communication with the tourist group (narration analysis).	
Assessment methods: Individual project report and presentation, practical classes assessment, written test.	
Recommended reading: 1.Prince: The art of guiding, The Institute of Tourism Guiding, 2nd ed., 2008; 2.Weaver, Lawton: Tourism Management, J. Wiley	

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Course name: Comercial Clinic Management	
Course code: TR03	Form of class: Group tutorial, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Hołodnik Daria, d.holodnik@po.opole.pl	
Prerequisites: English (min B1 level), Basics of Management and Economics	
Objectives of the course and learning outcomes: Practical knowledge about service problems in physiotherapeutic clinic. Business modeling based on client value co-creation paradigm.	
Teaching program: 1. Types of business models of physiotherapeutic clinic due to traditional and creative industries. 2. Holistic, virtual and knowledge based approaches in managing physiotherapeutic service. 3. Client service management. 4. Client value management in different types of physiotherapeutic clinic (SPA, medical clinic, fitness club etc.). 5. Designing the processes of delivering solutions to client's problems.	
Assessment methods: Paper examination, practical classes assessment	
Recommended reading: 1.Ramaswamy, Ozcan: The Co-creation Paradigm, Stanford Business Books, 2014 2.Strickdorn, Schneider: This is service design thinking: Basics, Tools, Cases, J. Wiley	

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Course name: Hotel Management and Service Excellence	
Course code: TR04	Form of class: Group tutorial, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Hołodnik Daria, d.holodnik@po.opole.pl	
Prerequisites: English (min B1 level), Basics of Marketing, Basics of Communication and Negotiation	
Objectives of the course and learning outcomes: Knowledge about service management in a hotel by using advanced coaching tools.	
Teaching program: Information, knowledge and energy management as a source of developing self- awareness and potentiality. Practical usage of the knowledge and wisdom pyramid (psychological and social perspective). Coaching as the tool of harmonizing the knowledge asymmetry in the company. Coaching as the method of client problem searching and defining. Types of client problems (personal, professional, health, mental, etc.) and the differentiation of delivery solutions methodology. Recognizing and building up relation between coach and coaches. Coaching as professional consulting process (within company e.g.: between employer and employee). Study case of various coaching implementation models. Conditions, circumstances and determinants of coaching success.	
Assessment methods: Oral and written paper examination	
Recommended reading: 1.Bouncken, Pyo: Knowledge Management in Hospitality and Tourism, Taylor and Francis, 2009; 2.McLeod, Vaughan: Knowledge Networks and Tourism, Taylor and Francis , 2014; 3.Lecture notes	

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Course name: Tourism Product	
Course code: TR05	Form of class: Group tutorial, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Hołodnik Daria, d.holodnik@po.opole.pl	
Prerequisites: English (min B1 level), Basics of Marketing, Basics of Communication and Negotiation, Basics of Sociology	
Objectives of the course and learning outcomes: Knowledge and skills about tourist product composing methods and its implementation into health services market.	
Teaching program: Structure and characteristics of tourist products (basic, extend, realistic psychological and potential product). Tourist product meaning in regard to B2B, B2C, B2M markets. Traditional and knowledge based health product.. Identification and detection of client preferences. Knowledge based client segmentation Standardisation, individualisation and personalization in product composing. Methodology of product co-creation according to client health program. Variants of shaping, communicating and delivering client values. Life-long client value management in case study.	
Assessment methods: Coursework, group project and presentation, test paper examination.	
Recommended reading: 1.Tresidder, Hirst: Marketing in Food, Hospitality, Tourism and Events: a critical approach, Goodfellow Publishers, 2012; 2.Strickdorn, Schneider: This is service design thinking: Basics, Tools, Cases, J. Wiley	

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Course name: Agro and Ecotourism	
Course code: TR06	Form of class: Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Woś Barbara, b.wos@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Student evaluates the potential of the natural environment and the possibilities of its use in agro and ecotourism , is able to develop agro and ecotourism product. Student is able to adapt the agro and eco- tourism offer to the needs of the market.	
Teaching program: Basis of agro and ecotourism in Poland and other countries (types of farms, main group of clients, typical offer, environmental and economic aspects). Case studies different agro and Eco farms and offers. Two terrain trip to selected Agro and Eco farms. How to prepare the agro and ecotourism product (step by step from beginning till working farm). Practical work - project of agro or Eco farm.	
Assessment methods: Group projetc	
Recommended reading: 1. S.J. Page, R. K. Dowling, Ecotourism, Prentice Hall, London 2002. 2. G. Holly, R.Ellie, Marketing starategies for agrotourism operation, University of California, 2011 3. L. Roberts, D. Hall, Rural tourism and recreation: Principles to practice. Cambridge: CABI Publishing 2001	

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Course name: Management	
Course code: TR07	Form of class: Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Zagórna-Goplańska Maja, m.zagorna-goplanska@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: This course focuses on developing skills and competency in the core functions in the process of management: planning, organizing, directing, motivating, controlling. Students are required to use tools and instruments to solve problems in the organizations. They are also expected to deal with knowledge of specific procedures within the management function. The course provides an overview on activities aimed at effective use of human teams and material means taken to achieve its objectives. After completing this course student has ability to make the correct selections of method and management techniques. Students can evaluate business decision and communicate properly within the designated organisational roles.	
Teaching program: Basic concepts and definitions of management and organization / management, managerial functions, organization, elements of organizations, resources, manager's job, levels of management/ The Environment of Organizations / general and task environment, internal elements in the organization/ Planning and Managing Decision Making./ different types of plans, steps in the planning process, Identify components in the process of decision making/Organizing. Organization Structure and Design / major elements of organizational structure, factors affecting organisational structure/ Managing Organizational Change / areas of organizational changes, resistance to change techniques to managing changes effectively/ Managing Human Resources and motivating / concepts, models of motivation, what the HRM is/ Leadership and management styles / 6 management styles/ Managing work groups of employees. Effective interpersonal communication./ techniques to manage people, examples of different types of communication/ Strategic management / steps In the process of strategic planning, mision, Visio, golas, implementing/ Process of controlling.	
Assessment methods: Written papers, activity during classes, practical classes assessment.	
Recommended reading: 1.Ricky W. Griffin, Management, 10th Edition, Texas A	

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Course name: Economics	
Course available with minimum number of 4 participants.	
Course code: TR08	Form of class: Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Zagórna-Goplańska Maja, m.zagorna-goplanska@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: The aim of this course is to develop knowledge and understanding about economic mechanism in the macro- and microeconomics. Students are required to investigate issues on economic behaviour of individuals, firms and government, the function and operation the market and contemporary economic problems. Students also develop skills to investigate and engage in effective analysis, synthesis and evaluation of economic information from a variety of sources.	
Teaching program: The classes are conducted according to the following themes modules: 1. Basic economic definitions and issues. 2. Supply and demand. 3. Markets in action. 4. Perfect and imperfect competition. 5. The national economy.GNP. 6. Macro- issues. 7. Fiscal and monetary policy. 8. Unemployment. 9. Inflation.	
Assessment methods: Written papers, activity during classes, practical classes assessment.	
Recommended reading: 1. J. Sloman, J., Economics. 7th ed. Harlow: Pearson, 2009 2. D. Begg, S. Fisher, R. Dornbush, Economics, 6th edition, 2000, McGRAW Hill 3. J. Sloman, Essentials of Economics , Prentice-Hall Financial Times,4th ed. 2007	

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Course name: Managing a Travel Busienss	
Course code: TR09	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Hołodnik Daria, d.holodnik@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level), Basic of Management and Marketing	
Objectives of the course and learning outcomes: Practical knowledge about tourism management in aspect of client value creation.	
Teaching program: 1.Classifications of the tourism companies due to traditional and creative industries. 2.Modern business models of a tourism company: virtual, based on knowledge, organizational learning, benchmarking, intelligent, agile. 3.Creating a client's value in the tourism service. 4.Desiging an organizational processes aimed at client value management. 5.A mulitiplied case study analysis : delivering solutions to tourist's problem.	
Assessment methods: Individual project paper report and presentation, practical classes assessment	
Recommended reading: 1.Ramaswamy, Ozcan: The Co-creation Paradigm, Stanford Business Books, 2014 2.Strickdorn, Schneider: This is service design thinking: Basics, Tools, Cases, J. Wiley	

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Course name: Marketing of Tourism and Leisure	
Course code: TR10	Form of class: Group tutorial, Project,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Hołodnik Daria, d.holodnik@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level), Basics of Communication and Negotiations	
Objectives of the course and learning outcomes: Practical knowledge about marketing communication between company and its clients. To get familiar with the modest marketing tools that can be applied across service based organization (functioning on leisure and touristic services market, e.g.: travel agency, fitness center, ecotourism farm, hotels, restaurants etc.)	
Teaching program: Analysis of features of traditional and postmodern marketing approaches used by a tourism and leisure service company. Impact of virtualization and digitalisation: reorientation in marketing philosophy making. Practical exploitation (case study analysis) of following marketing models, methods and concepts: •transactional (quantitative tools) CRM (customer relationship management), •psychological (qualitative tools) CRM, •sensory marketing, •experience marketing, •entrainment and event marketing. Differentiation of criteria in client segmentation and product placement.	
Assessment methods: Individual or group project paper report and presentation, practical classes assessment	
Recommended reading: 1.Tresidder, Hirst: Marketing in Food, Hospitality, Tourism and Events: a critical approach, Goodfellow Publishers, 2012; 2.Ramaswamy, Ozcan: The Co-creation Paradigm, Stanford Business Books, 2014; 3.Lecture notes.	

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Course name: Travel Consultancy	
Course code: TR11	Form of class: Group tutorial, Project,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Hołodnik Daria, d.holodnik@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level), Basics of Marketing, Basics of Communication and Negotiation	
Objectives of the course and learning outcomes: Familiarization with diagnostic methodology of information and knowledge flows. Comprehending consulting tools.	
Teaching program: Basics of information and knowledge management in profit and non-profit oriented tourism companies. The pyramid of wisdom. Creating a meaning field of a tourism organization (information flows and values) and a tourist (diagnosing priority preferences and key expectations of the tourist). Detection method of sharing and relating meaning fields. Tourist education as a new trend in travel consulting. The essence of consultancy (definition, types and approaches of coaching). Coaching as professional consultancy. Tourist's problem solving (relationship making between a coach and coachee). Study case of various coaching implementation models. Planning of the coaching phases and sessions.	
Assessment methods: Individual project paper report and presentation, practical classes assessment	
Recommended reading: 1.Bouncken, Pyo: Knowledge Management in Hospitality and Tourism, Taylor and Francis, 2009; 2.McLeod, Vaughan: Knowledge Networks and Tourism, Taylor and Francis , 2014; 3.Lecture notes	

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Course name: Alternative Health Coaching	
Course code: TR12	Form of class: Seminar,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Hołodnik Daria, d.holodnik@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level)	
Objectives of the course and learning outcomes: Comprehending coaching methods in the context of professional sport or health service support.	
Teaching program: Information and knowledge management as a new direction of relationship making potentiality. Practical usage of the knowledge and wisdom pyramid (social perspective). Coaching as the tool of harmonizing the knowledge asymmetry in the company. Coaching as the method of client health problems searching and defining. Types of client health problems (personal, professional, health, mental, etc.) and the differentiation of delivery solutions methodology. Recognizing and building up relation between coach and coaches. Coaching as professional consulting process (within company e.g.: between employer and employee). Study case of various coaching implementation models. Conditions, circumstances and determinants of coaching success.	
Assessment methods: Individual project	
Recommended reading: 1. Michael K. Simpson ; Unlocking Potential: 7 Coaching Skills That Transform Individuals, Teams, and Organizations, Brilliance Publishing, 2014. 2. Knowles Ann-Marie, Social Psychology in Sport and Exercise Linking Theory to Practice, Palgrave Macmillan Higher Ed, 2015 3. Lecture notes	

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Course name: Psychologie	
Course code: TR13	Form of class: Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: German	
Name of the lecturer and contact information: Machoń Henryk, h.machon@po.opole.pl	
Prerequisites: English (min B1 level), Deutsch (mindestens Stufe B1)	
Objectives of the course and learning outcomes: Einblick in die Denk- und Arbeitsweise der Psychologie als Wissenschaft vom Denken, Erleben und Verhalten und Erhellung ihrer Hauptströmungen wie Psychoanalyse, Behaviorismus, Humanistische Psychologie. Nach dem Kurs kennt der Student die psychologische Hauptbegriffe und kann mit ihnen unterschiedliche Phänomene und Problem deuten und erklären. Durch die Übungen im Rahmen der Sitzungen kann er an Diskussionen teilnehmen, unterschiedliche Rolle übernehmen und die gruppendynamische Prozesse gestalten.	
Teaching program: Einführung in die Psychologie durch die Darstellung ihrer Geschichte, Entstehung ihrer Hauptströmungen mit ihren unterschiedlichen Prämissen und Therapieformen sowie systematische Analyse ihrer Grundphänomene: Kognitionen, Emotionen, Verhalten und Motivationen. Hier werden unter anderen folgende Bereiche erhellte: Bewusstsein, Gedächtnis, Lernen, Sprache, Intelligenz, Persönlichkeit, Stress und Stressbewältigung, Gesundheit. Es wird auch die Sicht der Sozialpsychologie und ihre wissenschaftliche Mittel dargestellt. Zusätzlich werden die wichtigsten psychische Störungen präsentiert und die verschiedenen therapeutischen Methoden, die in der Therapie verwendet werden. Schließlich wird die Problematik der psychologischen Beratung und Hilfe unterstreichen.	
Assessment methods: Vorlesung und Seminar. Im Rahmen des Seminars soll jede(r) TeilnehmerIn ein Referat (Präsentation) vorbereiten und gehalten, das benotet wird. Mündliche Prüfung.	
Recommended reading: Hans-Peter Nolting, Peter Paulus, Psychologie lernen: Eine Einführung und Anleitung, Beltz 2016. Wolfgang Schönplug, Einführung in die Psychologie, Beltz 2006. Hans Goller, Erleben, Erinnern, Handeln: eine Einführung in die Psychologie und ihre philosophischen Grenzfragen, Kohlhammer 2009. 3. Hans Goller, Erleben, Erinnern, Handeln: eine Einführung in die Psychologie und ihre philosophischen Grenzfragen, Kohlhammer 2009.	

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Course name: Einführung in die Philosophie	
Course code: TR14	Form of class: Group tutorial, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 2	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: German	
Name of the lecturer and contact information: Machoń Henryk, h.machon@po.opole.pl	
Prerequisites: English (min B1 level), Deutsch (mindestens Stufe B1)	
Objectives of the course and learning outcomes: Einführung in die Philosophie als Königin der Wissenschaften mit besonderer Berücksichtigung der Kernprobleme und Phänomene, wie sie schon Immanuel Kant formuliert hat: Was kann ich wissen? (Erkenntnistheorie), Was soll ich tun? (Ethik), Was darf ich hoffen? (Religionsphilosophie), Was ist der Mensch? (Anthropologie). Diese Fragen werden beantwortet aus der Sicht verschiedenen philosophischen Schulen. Der Student kennt die philosophische Grundbegriffe, versteht ihre Bedeutung und ihren Platz in der Geschichte der Philosophie und in der Gegenwart. Er kann auf die philosophische Dimension verschiedener Phänomenen hinweisen und ist in der Lage ihre Bedeutung erhellen.	
Teaching program: Die Veranstaltung ist systematisch angelegt und befasst sich unter anderen mit folgenden Phänomenen: die menschliche Freiheit, das Glück, das Gute (und ihre Grenzen), das Schöne, die Gerechtigkeit und das Leib-Seele-Problem. Die verschiedene Disziplinen der Philosophie, wie Anthropologie, Metaphysik und vor allem Ethik, werden hier durch ihre spezifische Fragen angedeutet, die reflektiert und beantwortet werden (z.B. ist Gerechtigkeit nötig, um das Glück zu erreichen?).	
Assessment methods: Vorlesung und Seminar. Im Rahmen des Seminars soll jede(r) TeilnehmerIn ein Referat (Präsentation) vorbereiten und gehalten, das benotet wird. Mündliche Prüfung.	
Recommended reading: 1. Jonas Pfister, Philosophie. Ein Lehrbuch, Reclam 2011. 2. Reiner Ruffing, Philosophie, Wilhelm Fink Verlag 2006. 3. Arno Anzenbacher, Einführung in die Philosophie, Verlag Herder 2002.	

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Course name: Introduction to Philosophy	
Course code: TR15	Form of class: Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 2	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Machoń Henryk, h.machon@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level)	
Objectives of the course and learning outcomes: This seminar will introduce you to some of the main areas of research in contemporary philosophy. Each module a different philosopher will talk you through some of the most important questions and issues in their area of expertise. This course will begin by trying to understand what philosophy is – what are its characteristic aims and methods, and how does it differ from other subjects? Then we'll spend the rest of the course gaining an introductory overview of several different areas of philosophy.	
Teaching program: Topics you'll learn about will include: - Epistemology, where we'll consider what our knowledge of the world and ourselves consists in, and how we come to have it; - Metaphysics, where we'll think through some fundamental conceptual questions about free will and the nature of reality; - Ethics (Moral Philosophy), where we'll attempt to understand the nature of our moral judgements and reactions – whether they aim at some objective moral truth, or are mere personal or cultural preferences; - Philosophy of science, where we'll investigate foundational conceptual issues in scientific research and practice; - Philosophy of Mind, where we'll ask questions about what it means for something to have a mind, and how minds should be understood and explained; - Political Philosophy, where we'll investigate whether we have an obligation to obey the law; - Philosophy of Religion, where we'll ask questions about god, belief (faith) and atheism.	
Assessment methods: Presentation, discussion most of the topics with examples. Oral exam.	
Recommended reading: Matthew Chrisman, Duncan Pritchard, Philosophy for Everyone, Routledge, New York City, 2014. Simon Blackburns, Think: A Compelling Introduction to Philosophy, Oxford University Press, Oxford 2001.	

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Course name: Psychology	
Course code: TR16	Form of class: Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 2	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Machoń Henryk, h.machon@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level)	
Objectives of the course and learning outcomes: This course will introduce you to the fundamental principles of psychology and to the major subjects of psychological inquiry. It has been designed to not only provide you with the tools necessary for the interest of psychology but as well to present you with a sampling of the major areas of psychology research. The seminar begins with a short overview of how psychology developed as an academic discipline and an introduction to a number of the basic methodologies most commonly deployed in its study. The subsequent units are arranged around broad areas of research, including emotion, cognition, development, memory, and psychopathology. The seminar will focus on well-substantiated research and current trends within each of these categories.	
Teaching program: Introduction to psychology: -the history and methods of psychology (review of the history of psychology as a discipline, by learning about both its ancient philosophical roots and its more recent reincarnation as a scientific field of study); -the nature of behavior (the nurture versus nature dispute, which asks whether humans are a product of their environment or of their biological makeup); -emotion, cognition, consciousness (discussion about emotional life, cognitions and how our perceptions of the World and ourself are influenced by our different states of consciousness); -learning and memory (the physical, mental, and emotional changes that an individual undergoes); -social psychology (the social behavior of individuals, groups, and entire societies as well as the influences that the relationships to these entities have on human being as individuals); -psychopathology (introduction to some groups of psychological disorders, like social anxiety, obsessive compulsive disorder, drug addiction, personality disorders etc.).	
Assessment methods: Presentation, discussion most of the topics with examples. Oral exam.	
Recommended reading: Richard Gerrig, Philip Zimbardo, Psychology and Life, (16th Edition), Allyn	

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Course name: Nutrition and supplementation in sport	
Course code: TR17	Form of class: Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Domaszewski Przemysław, p.domaszewski@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level)	
Objectives of the course and learning outcomes: Practical knowledge about nutrition and supplementation in different types of sports	
Teaching program: • Meaning of proper nutrition in optimising sport performance. • Analysis of basic types of dietary supplements typically used to enhance exercise and athletic performance. • Differences between variety forms of supplements. • Analysis of list of supplement published on Australian Sport Commission website: - A list (sports drink, sports gel, sports confectionery, liquid meal, whey protein, sports bar, electrolyte replacement, iron supplement, multivitamin/mineral, vitamin D, probiotics, caffeine, B-alanine, bicarobante, beetroot juice, creatine) - B list (quercetin, tart, exotic barriers, curcumin, anti-oxidants C and E, HMB, glutamine, fish oils, glucosamine) - C list (examples of supplements with little meaningful proof of beneficial effects) - D list (banned or at high risk of contamination with substances that could lead to a positive drug test)	
Assessment methods: Coursework, practical classes assessment	
Recommended reading: 1. Bean A. The complete guide to sports nutrition. 2009 2. Bean A. Sports Nutrition for Young Athletes. 2010 3. Mueller K., Hingst J. Athlete's guide to Sports Supplements. 2013	

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Course name: Theory and Methodology of Team Sport - Volleyball	
Course code: WF01	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Borzucka Dorota, d.borzucka@po.opole.pl	
Prerequisites: English (min B1 level), Physical education, biology, physics	
Objectives of the course and learning outcomes: Skills in teaching technical elements, basics of judging	
Teaching program: The subject programme covers the basic knowledge of methodology and specific exercises of the volleyball techniques, methods and forms of teaching volleyball, mastering practical elements and techniques for playing volleyball, knowledge and skills to enforcing regulations of the game. A particular focus is given on assimilation knowledge concerning individual and team tactics at the volleyball meeting.	
Assessment methods: Practical classes assessment	
Recommended reading: 1.http://www.fivb.com 2.Official Volleyball Rules 2017-2020 (FIVB) 3.Official Beach Volleyball Rules 2017-2020 (FIVB)	

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Course name: Theory and Methodology of Individual Sports - Swimming	
Course available with minimum number of 4 participants.	
Course code: WF02	Form of class: Lecture, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 3	Number of hours per semester: 45
Language of instruction: English	
Name of the lecturer and contact information: Wojciechowska-Maszkowska Bożena, b.wojciechowska-maszkowska@po.opole.pl	
Prerequisites: English (min B1 level), Physical education, biology, physics	
Objectives of the course and learning outcomes: Skills in teaching technical elements swimming, basics of judging.	
Teaching program: The subject programme covers the basic knowledge of methods of teaching swimming to children and youth; regulations and rules binding during a swimming competition, the procedure and action in case of threat of the human life in water.	
Assessment methods: Practical classes assessment	
Recommended reading: 1.http://www.polswim.pl/ 2.http://www.fina.org/ 3.http://www.len.eu/	

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Course name: Didactics of Physical Education	
Course code: WF03	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: October, February
Number of hours per week: 3	Number of hours per semester: 45
Language of instruction: English	
Name of the lecturer and contact information: Kuśnierz Cezary, c.kusnierz@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of pedagogical-psychological and bio-medical subjects.	
Objectives of the course and learning outcomes: The aim of the course is to acquaint students with the contemporary goals of physical education, basics principles of diagnosis of physical development, planning and evaluation of PE teaching in primary and secondary schools and to help them to become a competent and professional PE teacher. Students will gain the methodic competencies in leading, organization and planning of educational process as well as the creativity and skills to link up an individual scientific development with pedagogical practice.	
Teaching program: Methodics of physical education as a subject of studies. The contribution of PE methodics into an occupational preparation. Hierarchy of contemporary objectives of physical education. Principles of teaching-learning. Process of motor skills teaching. Shaping of the motor abilities in a physical education lessons. Intellectualisation of physical education. Knowledge as a basis for achieving pro-health competences. Individualisation in the PE process. Organisation and conducting lessons of PE. Methods and forms of physical education. The rules of selection of didactical means. Selection of exercises for the needs of lesson. Types of physical education lessons. Conspectus as a detailed plan of physical education lesson. Basic principles of elaboration. Safety conditions according to the applied methods and forms of exercises. Annual plan for the class. Grading and evaluation. Regulations and tasks of the school sport.	
Assessment methods: Conspectus of PE lesson in difficult conditions. Annual plan for the class. Oral examination.	
Recommended reading: 1. Madejski E., Pośpiech J., Węglarz J.: Identity of Polish Physical Education- European background. The State Higher Vocational School in Tarnow 2012. 2. Pośpiech J.: Physical education and school sport in European perspective-comparative studies. Towarzystwo Naukowe Kultury Fizycznej. Państwowa Wyższa Szkoła Zawodowa w Raciborzu. 2006. 3. Pośpiech J.: Identity of contemporary physical education – crisis or evolution? (in)European Journal of Physical	

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Course name: Summer Training Camp	
Course code: WF04	Form of class: Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: February
Number of hours per week: 60	Number of hours per semester: 900
Language of instruction: English	
Name of the lecturer and contact information: Wieloch Marcin, m.wieloch@po.opole.pl	
Prerequisites: English (min B1 level), Physical education, biology, physics	
Objectives of the course and learning outcomes: Fun and Games movement, theory and methodology of individual and team sports, teaching physical education, history of physical culture	
Teaching program: During the summer camp program, students learn the principles of organizing and conducting summer recreation of children and youth. Become familiar with the rules and principles of swimming in open water, games and activities field. During the course of sailing, students learn to build and labeling watercraft. The basic principles of maneuvering Sailboat dealer and windsurfing. Students also learn in the field of the advantages of practicing canoeing and kayaking. The combined skills acquired during a summer camp allow in the future safely and actively organize time pupils during the summer holidays on the water bodies.	
Assessment methods: Practical classes assessment	
Recommended reading: 1. www.open-water.pl 2. www.wopr.pl 3. www.polswim.pl 4. www.zeglarstwo.org.pl 5. www.windsurfing.pl	

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Course name: Theory and Methodology of Team Sport - Basketball	
Course code: WF05	Form of class: Lecture, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Nawarecki Dariusz, d.nawarecki@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: The aim of the course is to acquaint students with a theory and teaching methodology of basketball game. The course is dedicated to presenting its position and function in the curriculum of comprehensive education, and the main tasks are related to getting the knowledge of teaching methodology, mastering the elements technique and tactics of playing the basketball game.	
Teaching program: The program is conducted by following thematic modules: 1. History of basketball. 2. Standards of teaching, organization of teaching, methods of physical activity teaching. 3. Profile of basketball game, the basics of game instruction. 4. Moving on the field without the ball. 5. Additional measures – dribbling. 6. Additional measures – passing and holding. 7. Main measures – basketball shots. 8. Double forms of cooperation in offensive action. 9. Basics rules of offense. 10. Fast offense, half court offense. 11. Action control of the player during the game. 12. Individual defense of player guarding with or without the ball. 13. Team defense. 14. Mini basketball – targets, rules and game instruction. Basketball games organization.	
Assessment methods: Practice test, teaching during the part of the classes, classes' observation, discussion	
Recommended reading: 1. Arlet T.: Koszykówka podstawy Techniki i taktyki gry. Externa Kraków 2001 Syg.BWF:XI G 21,XI G 22, XI G 28, 2. Dembiński J.: Zasób ćwiczeń w nauczaniu podstaw techniki gry w koszykówkę. AWF Wrocław 1993 Syg. BWF: XI G 6 3. FIBA.: Oficjalne przepisy gry w koszykówkę. www.pzkosz.pl	

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Course name: Human Kinetics/ Anthropomotorics	
Course code: WF06	Form of class: Laboratory, Project, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Borysiuk Zbigniew, z.borysiuk@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: The aim of the course is to acquaint students with problems and the theory of motor abilities as a scientific issue covering the whole aspect of human motor activities in its complex and conditions. The main task is to present the essence of the problems, structure, changeability and conditions of human motor abilities.	
Teaching program: The programme is conducted according to the following themes modules: 1.Introduction to the Motor Control ideas, 2.Reviewing of the Kinetics Movement history, 3.Metodology aspects in research procedures of Human Kinetics fields, 4.Neurophysiological background of Motor Control, 5.Neuroplasticity as a basis of diagnostic neuromuscular activity, 6.Practical training in laboratory	
Assessment methods: Laboratory report, presentation.	
Recommended reading: 1. Schmidt R., Motor Control and Learning, Champaign IL: Human Kinetics, 1982. 2. Enoka R., Neuromechanics of Human Movement. Champaign IL: Human Kinetics, 2008. 3. Kelso J. Dynamic Patterns, Cambridge: MIT Press. 1995.	

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Course name: Theory and Methodology of Individual Sports - Gymnastics	
Course code: WF07	Form of class: Group tutorial, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 3	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Sojka-Krawiec Katarzyna, k.sojka-krawiec@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: The purpose of the course is to prepare students to teaching work on gymnastics at all level schools, non-school establishments as well as at the higher education institutions. Division of gymnastics and gymnastic exercises, their role in shaping of general physical fitness and assimilation of terminology for exercise planning. Key features of the forms of agility exercises, system and methodology of teaching various exercises. PE at school and main issues of methodology	
Teaching program: The practising classes are conducted by following themes structure: 1. Introduction of security rules during exercising on the gymnastic machines. 2. How muscles corpus, arms and legs works during gymnastic exercising- explanation and sample performing. 3. Gymnastic movement training programs- specification of equipment and tools. 4. Methodical aspects of the gymnastic training application in the PE at primary schools. 5. Particular classes assessment according to the gymnastic phases of practitioner development. 6. Apprehending of gymnastic assecuration methods. 7. Self- examining of gymnastic ability (flexibility, agility, elasticity etc.).	
Assessment methods: Practical classes assessment	
Recommended reading: 1. www.fig-gymnastics.com 2. Lecture notes.	

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Course name: Health Education	
Course code: WF08	Form of class: Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Nowak Paweł, p.nowak@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level)	
Objectives of the course and learning outcomes: Preparing students for implementing tasks in the teaching profession - tasks related to promoting health in the school community and the environment surrounding the school - is the aim of the subject.	
Teaching program: •Health literacy as contemporary public health challenge •Schools for Health in Europe Network - concept and functioning •Relations between physical education with health education •Physical education teacher as health educator •Activating methods used in health education •Didactic aids used in health education •Organization of health promoting events •Stages and principles of planning the health promotion program •Rules for developing the class scenarios •Evaluation in health education	
Assessment methods: practical classes assessment (project)	
Recommended reading: 1. Corbin C. B., Welk G. J., Corbin W.R., Welk K. A. (2006). Fundamental concepts of fitness and wellness with nutrition update. McGraw-Hill, New York 2. Downie R. S., Fyfe C., Tannahill A.(1994). Health promotion. Models and Values, Oxford University Press, New York. 3. Gilbert G. G., Sawyer R. G., McNeill E. B. (2011). Health education. Creating strategies for school and community health. Jones and Bartlett Publishers, Sudbury, Massachusetts.	

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Course name: Algebra and Analytical Geometry	
Course code: T001	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October
Number of hours per week: 4	Number of hours per semester: 60
Language of instruction: English	
Name of the lecturer and contact information: Ściegosz Hanna, h.sciegosz@po.opole.pl	
Prerequisites: English (min B1 level), Fundamental and relatively basic knowledge on mathematics beyond arithmetic.	
Objectives of the course and learning outcomes: The goal of this lecture comes to know the algebraic notations and to apply them to solve some technical problems.	
Teaching program: 1. Foundations of logic, types of proofs, mathematical induction; 2. Algebra of sets and subsets; 3. Algebraic structures: group, ring, field; 4. Complex numbers; 5. Rational functions, polynomials and partial fractions; 6. Matrices, matrix algebra 7. Square matrices; determinants, Laplace's formula; 8. Adjugate matrix, inverse matrix; 9. Systems of linear equations; 10. Cramer's rule; 11. Rouché-Capelli theorem; 12. Gauss-Jordan elimination; 13. Vector spaces, linear independence, bases of linear spaces, spanning vectors and spanned spaces; 14. Eigenvectors and eigenvalues of square matrices; 15. Three-dimensional analytic geometry (scalar and vector products, planes, straight lines, surfaces of second order).	
Assessment methods: Written and oral assessment, individual elaborate, two written tests during semester and written final exam.	
Recommended reading: 1. K.R. Matthews, Elementary linear algebra, Univ. of Queensland, Press 1991 2. D.J. Winter, A Primer of Linear Algebra, Macmillan, Press 1988 3. M. Artin, Algebra, Prentice Hall, 1991 4. W. L. Perry, Elementary Linear Algebra, MacGraw-Hill, 1988	

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Course name: Chemistry	
Course code: T002	Form of class: Lecture, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Mościpan Małgorzata, m.moscipan@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: To provide students with understanding of the basic concepts of chemistry and basic chemical calculations.	
Teaching program: Principles of chemistry, including stoichiometry, nomenclature, atomic structure, bonding, redox reactions, periodicity, equilibria, electrochemistry, kinetics, inorganic and organic compounds. The recitation hour – practice on chemical calculations and problem solving.	
Assessment methods: Written exams.	
Recommended reading: Lecture and class notes.	

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Course name: Differential Equations	
Course available with minimum number of 4 participants.	
Course code: T003	Form of class: Lecture, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Ściegosz Hanna, h.sciegosz@po.opole.pl	
Prerequisites: English (min B1 level), Fundamental knowledge of mathematics, an elementary course of mathematical analysis, differential and integral calculus of functions of one and several variables (Mathematics I and Mathematics II courses), ability to calculate derivatives and integrals quickly.	
Objectives of the course and learning outcomes: To introduce students to methods of solving of differential equations and modeling via differential equations. To present their applications.	
Teaching program: 1. Introduction and First Definitions; 2. First Order Differential Equations (Separable Equations, Homogeneous Equations, Linear Equations, Bernoulli Equations, Darboux Equations, Riccati Equations, Exact and Non-Exact Equations, Integrating Factor technique, Numerical Technique: Euler's Method) 3. Existence and Uniqueness of Solutions, Picard Iterative Process; 4. Second Order Differential Equations (Reduction of Order, Euler-Cauchy Equations); 5. Higher Order Linear Equations (Homogeneous Linear Equations with Constant Coefficients, Non-Homogeneous Linear Equations, Method of Undetermined Coefficients, Method of Variation of Parameters, Linear Independence and the Wronskian); 6. Systems of Differential Equations (Second Order Equations and Systems, Euler's Method for Systems, Linear Systems, Qualitative Analysis of Linear Systems).	
Assessment methods: Written and oral assessment, individual elaborate, written final exam.	
Recommended reading: 1. P. Blanchard, R. L. Devaney, G. R. Hall, Differential equations, Cengage Learning, 2006; 2. J. C. Robinson, An introduction to ordinary differential equations, Cambridge University Press, 2004; 3. R. Bronson, E. J. Bredenstener, Differential equations, McGraw-Hill Professional, 2003. 4. B. Sikora, E. Łobos, A First Course in Calculus, Wydawnictwo Politechniki Śląskiej, 2007;	

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Course name: Ecology	
Course available with minimum number of 4 participants.	
Course code: T004	Form of class: Lecture, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Hnydiuk-Stefan Anna, a.hnydiuk-stefan@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Knowledge of the risks to the environment and the rules in environmental management systems. Global climate change and mechanisms to avoid it. Knowledge of the use of fossil fuels - non-renewable and renewable energy sources and the impact of their use on the environment. The student is able to: plan waste management in the company; to assess the risks to the environment and the manner of their elimination to provide environmental protection and is able to determine the priorities for the company's environmental management systems.	
Teaching program: 1. Selected elements of environmental law. 2. The greenhouse gases effect, greenhouse gas emissions into the atmosphere. 3. European Union emissions trading scheme, Clean Development Mechanisms, Joint Implementation. 4. Ecological Processes in Environmental Impact. 5. Emissions of harmful substances into the air. 6. Environmental aspects of energy conversion. 7. Renewable energy sources. 8. Energy efficiency. 9. Clean technologies. 10. Types of wastes and waste management in the company. 11. Wastewater management.	
Assessment methods: Test paper examination or individual project paper report.	
Recommended reading: 1. Thampapillai D., Environmental Economics: Concepts, Methods and Policies, Oxford University Press, Melbourne 2006. 2. Bartnik R., Bartnik B., Hnydiuk-Stefan A: Optimum Investment Strategy in the Power Industry. Mathematical Models. Springer, New York 2016. 3. EU ETS Directive 2009/29/EC.	

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Course name: Engineering Graphics	
Course available with minimum number of 4 participants.	
Course code: T005	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Moryń Stefan , s.moryn@po.opole.pl	
Prerequisites: English (min B1 level), English (the first certificate/FCE level).	
Objectives of the course and learning outcomes: Teaching practical skills of drawing and sketching geometric constructions on the plane and read technical drawings. Drawing objects using cross-section, half-view, half-section and revolved section. Drawing objects in rectangular and axonometric projections. Practical dimensioning of objects. Making working and assembly drawings. Making drawings using Auto CAD program. Correlation with a group of objects that use engineering drawing.	
Teaching program: Constructing projections and performing sketches. Sketching and freehand drawing of geometric constructions in the plane. Graphical representation of three-dimensional objects. The ability to produce such objects using cross-section, half-view, half-section and aligned section. Drawing development of surface and penetration of solids. Drawing Standards. Working and assembly drawings, dimensioning. Symbols on the construction drawings. Roughness and direction of lay, engineering fit and interference fit, positional and geometrical tolerance, angularity and slope. Standardized components. Dimensional analysis. Computer aided design methods for buildings and machinery.	
Assessment methods: Written exam (5 out of 7 technical drawings need to be positively assessed by the lecturer).	
Recommended reading: ---	

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Course name: Entrepreneurship for Engineers	
Course code: T006	Form of class: Lecture, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Jagoda-Sobalak Dominika, d.jagoda@po.opole.pl	
Prerequisites: English (min B1 level), Basic in management	
Objectives of the course and learning outcomes: The main objective of a course is to explore the entrepreneurial spirit. It is a key source of development for all companies of all sizes and industries. The course provides students with an ability to function multidisciplinary teams and to communicate effectively. It is crucial for create and present a business plan for a new technology idea. The course provide also the background, tools, and human skills to participate in the entrepreneurial process.	
Teaching program: The course will include issues such as: a) Product, Market, Sales, and Technology analysis. b) Opportunity identification and solution development: how to identify market trends and innovations that can lead to exciting new products and services. c) Learning, decision-making and leadership: how to form and manage product development teams. d) Explores the role of development and manufacturing partners. e) Entrepreneurship in its various forms, including startup growth ventures, entrepreneurship in small and medium enterprises, and microbusinesses.	
Assessment methods: Evaluation of individual presentations and also attention, punctuality, learning willingness.	
Recommended reading: a) Whittaker D.H.: Comparative Entrepreneurship: The UK, Japan, and the Shadow of Silicon Valley. Oxford Scholarship, 2011. b) Drucker P.: Innovation and Entrepreneurship. The Classic Drucker Collection, 2007. c) Lowe R., Marriott S.: Enterprise: Entrepreneurship and Innovation: Concepts, Contexts and Commercialisation, Oxford and Burlington, MA: Butterworth-Heinemann 2006.	

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Course name: Fundamentals of Management	
Course code: T007	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Hys Katarzyna, k.hys@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge in the scope of the management.	
Objectives of the course and learning outcomes: The aim of the course is to learn the elementary principles of management. Will be presented, among others: precursors, management ideas, concepts, basic strategy. It gives the introduction into all areas of management.	
Teaching program: 1. Idea of Management. 2. Fundamentals of Management in the context of precursors. 3. The fundamental principles of management 3a. Planning: Problem Solving and Decision Making, Strategic and Operating Plan 3b. Organizing work: job design, authority and delegating work 3c. Motivation: incentive systems in the organization 3d. Control: the idea, areas, methods of control. 4. Human Resources Management. 5. Organizational Behaviour.	
Assessment methods: activity, systematic work in the classroom, preparing reports for the issues.	
Recommended reading: 1. Quinn S., Management Basics Bissett School of Business, 2013, http://bookboon.com/en/management-basics-ebook 2. Griffin R.W., Fundamentals of management, South-Western College Pub, 2011. 3. Robert Lussier R., Management Fundamentals: Concepts, Applications, Skill Development, Cengage Learning, 2008.	

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Course name: Industrial Marketing	
Course code: T008	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Hys Katarzyna, k.hys@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge in the scope of the management	
Objectives of the course and learning outcomes: Acquainting students with bases of industrial marketing, including cells, tasks, functions, strategies, instruments and essential methods are a purpose of the object. Exploiting the wisdom in practice is significant - this process is being carried out on exercise classes as part of individual issues.	
Teaching program: 1. Description of the work of the marketing department for companies on the market B2B (business to business): vision, mission of the department, organizational structure. 2. Evaluation of the current marketing situation of the enterprise: SWOT analiza, Marketing environment of the company. Offered products. Target market. Competition analysis. Analysis of chances and threats. 3. Defined marketing objectives: Cells in a short span of time. Cells in the long term. 4. Proposals of marketing strategies (7P formula): Chosen action in the sphere of the product, the price, distribution and promotion-mix. 5. Operational plans: Schedule of action carried out. Duties and liabilities of the staff.	
Assessment methods: activity, systematic work in the classroom, preparing reports for the issues	
Recommended reading: 1. The Industrial (Marketing) Revolution: How Technology Changes Everything for the Industrial Marketer by Jared R. Fabac (Jul 15, 2013) 2. Industrial Marketing Strategy by Frederick E. Webster Jr. (May 1, 1995) 3. The Fundamentals of Business-to-Business Sales	

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Course name: Innovation Management	
Course code: T009	Form of class: Lecture, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Jagoda-Sobalak Dominika, d.jagoda@po.opole.pl	
Prerequisites: English (min B1 level), Basic: Management	
Objectives of the course and learning outcomes: The focus of the course is on the analysis of key issues surrounding innovation management from the perspective of firms. By the end of the course, students will be able to understand what Innovation Management is and how it relates to business strategy and also distinguish some key characteristics of successful innovation and successful innovators. They should understand aspects of the process through which innovation occurs too. These perspectives should give insight to what influences innovation and how this varies across industries, sectors and through time. Furthermore, they will learn about the role of organizational structures and strategies in innovation. Students will develop skills in both the technical and business aspects of managing innovation.	
Teaching program: The course will include issues such as: a) discusses a number of theories of innovation which provide an historical basis for where we are now (technology waves); b) shows the role of innovation in creating competitive advantage c) presents the impact of different types of innovations on the firm, economy and society; d) describes the various sources of innovation and how to transfer innovations from their sources to points where they can be exploited; e) recognize the potential of an innovation; f) description how to developing a culture and climate of innovation; g) organizing for innovation, customers involvement in innovation; h) innovation process – what are the stages of innovation process from idea generation through to commercialization; i) explores how innovation can be financed; describes the important role government policy plays in supporting business innovation.	
Assessment methods: Course is assessed by a combination of written work and presentation.	
Recommended reading: a) Fagerberg, Jan, David C. Mowery and Richard R. Nelson (2005): The Oxford handbook of innovation. Oxford University Press. b) Tidd, Joe, John Bessant and Keith Pavitt (2009): Managing innovation, integrating technological, market and organizational change, 4. ed. John Wiley and Sons Ltd. c) von Hippel, Eric (2005): Democratizing Innovation Cambridge, MA: MIT Press. d) Rogers, Everett (2003): Diffusions of Innovations (5th Ed.), Free Press. e) Trott, P. (2008) Innovation Management and New Product Development, (3rd Ed.), Harlow: Prentice Hall. f) Smith, D. (2010) Exploring Innovation, 2nd Ed. Berkshire: McGraw-Hill. g) von Stamm, B. (2008) Managing Innovation, Design and Creativity (2nd Ed.), John Wiley	

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Course name: Logistics and Supply Chain Management	
Course available with minimum number of 4 participants.	
Course code: T010	Form of class: Lecture,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Kulińska Ewa, e.kulinska@po.opole.pl	
Prerequisites: English (min B1 level), English (the first certificate/FCE level)	
Objectives of the course and learning outcomes: The following skills and competence: - identification of basic group elements of processes and logistic systems; - interpretation – on a system basis – logistic relations of commercial situation of a company; - determining and analysis of the basic logistic processes and management functions; - understanding the principles of logistics management; - defining of supply chain; - identification of factors integrating companies and its systems in supply chain; - carrying out process based analysis of supply chain; - establishment the strategies of supply chain management; - identification directions of a supply development chain management.	
Teaching program: 1. Devoted to issues connected with the presentation of logistics, its genesis and fundamental matters referring to functional and phase segmentation of entity's logistics. Explained the basis of logistic strategy construction. 2. General system based approach and its application in a company was included. 3. A key feature of process based approach, logistic processes and their types were provided. 4. Forms of company's cooperation within supply chain, its management and factors integrating companies into supply chains were discussed. 5. The involvement into issues connected with risk management. The complexity of supply chains and logistic processes cause that the analysis without considering safety issues cannot be done. 6. Phases and elements as well as methods of risk management. Examines the tasks and place risk management logistic processes, procedure of process oriented risk management and ways of mapping risk.	
Assessment methods: Written exam and oral discussion	
Recommended reading: ---	

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Course name: Managing the Service Quality	
Course code: T011	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Hys Katarzyna, k.hys@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge in the scope of the management.	
Objectives of the course and learning outcomes: Understanding the being of the service quality is a purpose of classes. Getting acquainted with types of services and characteristic features of services. Distinguishing types of services and the guild of services for individual types of the market: B2B and B2C. Examining and knowing requirements of customers for services of different type. Forming the semantic profile for competence of the service staff. The evaluation and the measurement of the service quality of methods with the help chosen.	
Teaching program: 1. Defining and classifying services. 2. Designing and presenting services. 3. Services providing company – internal and outside conditioning. 4. The service contact and the buying decision process of the service. 5. Applying the mix concept of marketing in services. 6. Issues of the quality in services. 7. Problems and manners of the evaluation of the service quality. 8. Competence of employees of service companies. 9. Offer of production services – the questionnaire form and comparison. 10. Blueprinting for production services.	
Assessment methods: Exercises: active participation under the exercises, written report	

Recommended reading:

1. Baker, E. R. and Fisher, M. J., Organizing for Quality Management - Handbook of Software Quality Assurance, Artech House Inc., pp. 1-34, 2008;
2. Balog, A., Badulescu, G., Badulescu, R. and Petrescu, F. E-ServEval: a system for quality evaluation of the on-line public services, Revista Informatica Economica, Bucharest, no. 2(46), 2008;
3. Fotache, M. Probleme generale ale managementului cunostintelor, ISIS 2002, Iassy, 24-26 October, 2002;
4. Gareis, R. Professional Project Portfolio Management, IPMA World Congress, Berlin, 2002;
5. Järvinen, R. and Lehtinen, U. Services, e-Services and e-Service Innovations, Combination of Theoretical and Practical Knowledge Frontiers of e-business research, Tampere University of Technology and University of Tampere, 2004, pp. 78-89;
5. Kalle, K. Business Strategies for Information Technology Management, Idea Group Publishing, 2003;
6. Louise, E. Are we managing our knowledge?, Science, Innovation and Electronic Information Division Statistics, Canada, 2000;
7. Neagu, D. The intelligent enterprise in Knowledge Society, in proceedings of "Knowledge Technologies in Business and Management", Iassy, June 6, 2003;
8. Pocatilu, P. IT Projects Management Metrics Informatica Economica Journal, Bucharest, no.4(44), 2007, pp. 122-125;
9. Rust, R. T. and Kannan, P. K. e-Service: New Direction in Theory and Practice, Armonk NY, 2002;
10. Scupola, A. E-Services: Definition, Characteristics and Taxonomy, Journal of Electronic Commerce in Organizations, Guest Editorial Preface, 2008;
11. Sukasame, N. E-Service Quality: A Paradigm for Competitive Success of E-Commerce Entrepreneurs, The Ninth Pacific Asia Conference on Information Systems (PACIS-2005), 2005;
12. Whitman, M. E. and Wozzczyński, A. B. The Handbook of Information Systems Research, Idea Group Publishing, 2004;
13. Quality Management Principles, [Online], Available:
http://www.iso.org/iso/iso_catalogue/management_standards/iso_9000_iso_14000/qmp.htm.

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Course name: Marketing	
Course code: T012	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Hys Katarzyna, k.hys@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge in the scope of the management.	
Objectives of the course and learning outcomes: Acquainting students with bases of marketing, including cells, tasks, functions, strategies, instruments and essential methods are a purpose of the object. Exploiting the wisdom in practice is significant - this process is being carried out on exercise classes as part of individual issues.	
Teaching program: 1. Description of the work of the marketing department: vision, mission of the department, organizational structure. 2. EVALUATION OF THE CURRENT MARKETING SITUATION OF THE ENTERPRISE: Marketing environment of the company. Offered products. Target market. Competition analysis. Analysis of chances and threats. 3. DEFINED MARKETING OBJECTIVES: Cells in a short span of time. Cells in the long term. 4. PROPOSALS OF MARKETING STRATEGIES: Chosen action in the sphere of the product, the price, distribution and promocji-mix. 5. OPERATIONAL PLANS: Schedule of action carried out. Duties and liabilities of the staff.	
Assessment methods: exercises: active participation under the exercises, written report.	
Recommended reading: 1. Hoyer, W.D. and MacInnis, D.J. (2001) Consumer Behaviour, 2nd Edition, USA: Houghton Mifflin Company; 2. Baker, M. (2000) Marketing Management and Strategy, 3rd edition, Macmillan Business; 3. Booms, B.H. and Bitner, M.J. (1981), Marketing strategies and organisation structures for service firms, in Marketing of Services, J. Donnelly and W.R. George (eds), American Marketing Association; 4. Davies, M. (1998) Understanding Marketing, 1st edition. Prentice Hall; 5. Fill, C (2002) Marketing Communications, Contexts, strategies and applications, Prentice Hall; 6. Kotler, P, Armstrong, G, Saunders, J and Wong, V, (2001), Principles of Marketing: Third European Edition, Prentice Hall, Harlow; 7. Kotler, P. and Armstrong, G. (1997) Marketing An Introduction. Fourth Edition. New Jersey. Prentice Hall International; 8. Kotler, P., Armstrong, G., Saunders, J. and Wong, V. (1999) Principles of Marketing, 2nd Edition, New Jersey: Prentice Hall; 9. Lauterborn, R.(1990), New marketing litany:4Ps passe; 4Cs take over, Advertising Age, Oct. 1:26; 10. Lovelock (2001) Services Marketing, people, technology, strategy, Prentice Hall; 11. McCarthy, J. (1975), Basic Marketing: a managerial approach, Homewood, IL; 12. McDonald, M. (2001) Marketing Plans. How to prepare them, how to use the. 4th edition, Butterworth Heinemann; 13. Peter, J.P. and Olson, J.J. (1996) Consumer Behaviour and Marketing Strategy, USA: Irwin.	

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Course name: Mathematical Modeling in Technology	
Course code: T013	Form of class: Lecture, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Metelski Andrzej, a.metelski@po.opole.pl	
Prerequisites: English (min B1 level), Mathematics 1, Mathematics 2	
Objectives of the course and learning outcomes: Fundamentals of modelling physical processes using numerical methods and computer software.	
Teaching program: The participants learn about: - basic concepts of mathematical modeling, - analytical models for 1D and 2D transient heat conduction problems (different types of boundary conditions), - finite element method for 1D problems (Galerkin method), - finite element method for 2D problems (Galerkin method), - two dimensional isoparametric elements (linear and quadratic), - mapping technique, - numerical integration (for example Gauss quadrature), - building computer software for the solution of two dimensional transient heat conduction problems (using Matlab program), - presentation of recent scientific researches (connected with the field of study and numerical methods application).	
Assessment methods: Presentation of chosen scientific research.	
Recommended reading: 1. J.V.Beck, B.Blackwell, J.R.St.Clair, Inverse heat conduction, a Wiley Interscience Publication, 1985; 2. B.Mochnacki, J.S.Suchy, Numerical methods in computations of foundry processes, PFTA, Cracow 1995; 3. O.C.Zienkiewicz, The finite element method, Butterworth-Heinemann, Oxford, 2000.	

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Course name: Mathematics I	
Course code: T014	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October
Number of hours per week: 4	Number of hours per semester: 60
Language of instruction: English	
Name of the lecturer and contact information: Ściegosz Hanna, h.sciegosz@po.opole.pl	
Prerequisites: English (min B1 level), Fundamental knowledge of mathematics, elementary functions, some experience with mathematical language and proofs.	
Objectives of the course and learning outcomes: The goal of this lecture comes to know the algebraic notations and to apply them to solve some technical problems. Introducing of students to differential and integral calculus of real functions of one variable and providing the background for more advanced mathematical courses.	
Teaching program: 1. Mappings and their properties; 2. Sequences of numbers and limits of sequences; 3. Elementary functions; 4. Limits of one variable functions, continuity; 5. Differentiation of one variable functions; 6. Applications of the derivative to geometry and physics; 7. Graphing of functions using first and second derivatives; 8. Definition of the indefinite integral; 9. Integration by parts; 10. Integration by substitution; 11. Integration of rational functions; 12. Definition of the Riemann integral; 13. Applications of the definite integral; 14. Definition of the improper integral, tests for convergence; 15. Length of a curve, lateral area and volume of surface of revolution.	
Assessment methods: Written and oral assessment, individual elaborate, three written tests during semester.	
Recommended reading: 1. E. Zakon, Mathematical Analysis I, The Trillia Group, 2004; 2. B. S. Schroder, Mathematical Analysis: A Concise Introduction, JohnWiley, 2008; 3. G.M. Fichtenholz, Course in the Differential and Integral Calculus vol. I, II, III, Nauka, Moscow, 1969. 4. B. Sikora, E. Łobos, A First Course in Calculus, Wydawnictwo Politechniki Śląskiej, 2007	

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Course name: Mathematics II	
Course code: T015	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Ściegosz Hanna, h.sciegosz@po.opole.pl	
Prerequisites: English (min B1 level), Fundamental knowledge of differential and integral calculus of real functions of one variable (Calculus I course), some experience with mathematical language and proofs.	
Objectives of the course and learning outcomes: Introducing of students to polynomial and trigonometric expansions of functions of one variable and to differential calculus of functions of several variables. Providing the background for more advanced mathematical courses.	
Teaching program: 1. Infinite series of numbers; 2. Positive series, convergence criteria, relative and absolute convergence; 3. Sequences and series of functions, Weierstrass majorant criterion; 4. Power series, domain of convergence; 5. Fourier real and complex series, applications; 6. Basic properties of n-dimensional Euclidean space; 7. Limits of several variable functions, continuity; 8. Partial derivatives, gradient, total differential, directional derivative, tangent plane; 9. Higher order derivatives, Hessian matrix; 10. Differential calculus for vector valued functions, Jacobian matrix; 11. Extreme of several variable function and its applications; 12. Relative extrema.	
Assessment methods: Written and oral assessment, individual elaborate, two written tests during semester, written final exam.	
Recommended reading: 1. E. Zakon, Mathematical Analysis I and II, The Trillia Group, 2004; 2. B. S. Schroder, Mathematical Analysis: A Concise Introduction, JohnWiley, 2008; 3. G.M. Fichtenholz, Course in the Differential and Integral Calculus vol. I, II, III, Nauka, Moscow, 1969. 4. B. Sikora, E. Łobos, A First Course in Calculus, Wydawnictwo Politechniki Śląskiej, 2007	

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Course name: Mathematics III	
Course available with minimum number of 4 participants.	
Course code: T016	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Ściegosz Hanna, h.sciegosz@po.opole.pl	
Prerequisites: English (min B1 level), Fundamental knowledge of differential and integral calculus of one and multivariable real functions (Mathematics I and Mathematics II courses), ability to calculate derivatives and integrals quickly, knowledge of the shape of the second order surfaces.	
Objectives of the course and learning outcomes: Introducing of students to integral calculus of functions of several variables.	
Teaching program: 1. Definition and main properties of a double integral; 2. Change of a double integral to an iterate integral; 3. Change of variables in a double integral; 4. Applications of a double integral to geometry and physics; 5. Definition and main properties of a triple integral; 6. Change of a triple integral to an iterate integral; 7. Change of variables in a triple integral; 8. Applications of a triple integral to geometry and physics; 9. Parametric form of curves in 3-D space; 10. Line integral of a scalar fields, definition, properties and change to definite integral; 11. Line integral of a vector fields, definition, properties and change to definite integral; 12. Potential of vector field, path independence; 13. Line integral of a vector field in 2-D space, Green's theorem; 14. Parametric form of surfaces; 15. Surface integral of a scalar fields, definition, properties and change to double integral; 16. Surface integral of a vector fields, definition, properties and change to double integral; 17. Rotation and divergence, Gauss-Ostrogradsky's and Stokes' theorems and their applications.	
Assessment methods: Written and oral assessment, individual elaborate, written final exam.	
Recommended reading: 1. E. Zakon, Mathematical Analysis I and II, The Trillia Group, 2004; 2. B. S. Schroder, Mathematical Analysis: A Concise Introduction, John Wiley, 2008; 3. G.M. Fichtenholz, Course in the Differential and Integral Calculus vol. I, II, III, Nauka, Moscow, 1969; 4. B. Sikora, E. Łobos, A First Course in Calculus, Wydawnictwo Politechniki Śląskiej, 2007.	

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Course name: Professional Ethics	
Course available with minimum number of 4 participants.	
Course code: T018	Form of class: Lecture,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Wolczański Tomasz , t.wolczanski@po.opole.pl	
Prerequisites: English (min B1 level), English (the first certificate/FCE level).	
Objectives of the course and learning outcomes: Enrichment of competence in sound knowledge and skills in understanding the theory of ethics. The course is also rich in knowledge in the field of ethics in professional relations, formation of consciousness, legal responsibilities, ethical and social-related economic activity and the formation of the desired socially responsible attitudes of the people involved in the business.	
Teaching program: Basic concepts of ethics, morality, the science of morality. Differences between the concept of morality and ethics as the science of morality. Categories of moral norms. Decision-making. Professional secrecy and the possibility of its suspension. Problem of reliability and adherence to agreements. Corruption as a social problem. Human rights. Social attitudes of the people involved in the business. Protection of Industrial Property. Crossing of cultures and unrestricted flow of information. Contemporary moral dilemmas relating to the requirement of tolerance and freedom. Fairness in human resource management. Categories of justice.	
Assessment methods: Written exam and oral discussion	
Recommended reading: ---	

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Course name: Project Management	
Course code: T019	Form of class: Lecture, Project,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Łapunka Iwona, i.lapunka@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge in the scope of the Management, Economics, Finance and Accounting, Operations Research	
Objectives of the course and learning outcomes: The aim of this course is to acquaint students with the theoretical foundations of project management and elements of practical knowledge needed to participate in a project team or conduct of individual projects (subprojects). Students will acquire and establish knowledge about methods of planning, estimating and scheduling projects, and computer software available in this area.	
Teaching program: 1. The Project Management Framework: What is a project?, What is project management?, Relationship to other management disciplines related endeavors, The project management context, Project phases and the project life cycle, Project stakeholders, Organizational influences, Key general management skills, Socioeconomic influences. 2. Project Management Processes: Process groups, Process interactions, Customizing process interactions. 3. The Project Management Knowledge Areas: Project integration management, Project plan development, Project plan execution, Overall change control. 4. Project Scope Management: Initiation, Scope planning, Scope definition, Scope verification, Scope change control. 5. Project Time Management: Activity definition, Activity sequencing, Activity duration estimating, Schedule development, Schedule control. 6. Project Cost Management: Resource planning, Cost estimating, Cost budgeting, Cost control. 7. Project Quality Management: Quality planning, Quality assurance, Quality control. 8. Project Human Resource Management: Organizational planning, Staff acquisition, Team development. 9. Project Communications Management: Communications planning, Information distribution, Performance reporting, Administrative closure. 10. Project Risk Management: Risk identification, Risk quantification, Risk response development, Risk response control. 11. Project Procurement Management: Procurement planning, Solicitation planning, Solicitation, Source selection, Contract administration, Contract close-out.	
Assessment methods: Lecture - oral examination; active participation in the project; project completion of individual assignments, written report.	
Recommended reading: 1. Adam E.E., Ebert R.J., Productions and operations management, Prentice Hall, New Jersey 2009. 2. A guide to the project management body of knowledge. Fourth Edition, PMI, USA 2008. 3. Goldratt E. M., Critical chain. Great Barrington, MA, North River Press 1997. 4. Kerzner H., Advanced project management: best practices on implementation, John Wiley	

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Course name: Quality Management	
Course code: T020	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 7	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Hys Katarzyna, k.hys@po.opole.pl Kucińska-Landwójtowicz Aneta, a.kucinska@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Purpose of the exercise: Methods supporting the quality management in the production in real conditions (in the given enterprise).	
Teaching program: Process approach in quality management systems within an organization. Assumptions for process approach covered by ISO 9001. Definitions related to processes. Human, equipment and material resources management. Processes distribution within an organization. Methods of process determination within an organization. Documentation of the process-based quality management system.	
Assessment methods: activity, systematic work in the classroom, preparing reports for the issues.	
Recommended reading: 1. ISO 9001; Quality management systems - requirements. 2. Quality Associates International's History of FMEA 3. E. Fadlovich, Performing Failure Mode and Effect Analysis [1] 4. http://www.asq.org/learn-about-quality/process-analysis-tools/overview/fmea.html 5. Kmenta, Steven; Koshuke Ishii (November 2004). "Scenario-Based Failure Modes and Effects Analysis Using Expected Cost". Journal of Mechanical Design 126 (6): 1027. 6. HARVARD BUSINESS REVIEW, The House of Quality by John R. Hauser and Don Clausing, May-June 1988 7. Maisel, L.S., "Performance measurement: the balanced scorecard approach", Journal of Cost Management, Vol. 6 No. 2, 1992, pp. 47-52. 8. Cobbold, I. and Lawrie, G. (2002a). "The Development of the Balanced Scorecard as a Strategic Management Tool". Performance Measurement Association 2002 9. Kaplan R.S. and Norton D.P. (2000). The Strategy Focused Organization, HBS Press, USA.	

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Course name: Quality Management of Production	
Course code: T021	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Hys Katarzyna, k.hys@po.opole.pl Kucińska-Landwójtowicz Aneta, a.kucinska@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge in the scope of the management	
Objectives of the course and learning outcomes: Purpose of the exercise: Methods supporting the quality management in the production in real conditions (in the given enterprise).	
Teaching program: Applying chosen methods of estimation of the product quality: • Quality Function Deployment (QFD), • Failure mode and effects analysis (FMEA), • Complaint resolution (procedure), • Strategic scorecard (BSC), • Ranking of Suppliers according to beloveds of criteria, • Audits (list of test questions, check list).	
Assessment methods: activity, systematic work in the classroom, preparing reports for the issues	
Recommended reading: 1. Quality Associates International's History of FMEA; 2. E. Fadlovich, Performing Failure Mode and Effect Analysis [1]; 3. http://www.asq.org/learn-about-quality/process-analysis-tools/overview/fmea.html; 4. Kmenta, Steven; Koshuke Ishii (November 2004). "Scenario-Based Failure Modes and Effects Analysis Using Expected Cost". Journal of Mechanical Design 126 (6): 1027; 5. HARVARD BUSINESS REVIEW, The House of Quality by John R. Hauser and Don Clausing, May-June 1988 6. QFD FAQ: Frequently Asked Questions about QFD 7. http://www.webducate.net/qfd/ 8. QFD Online - Free House of Quality (QFD) Templates for Excel 9. "What is QFD?" - White paper explaining what QFD is and how to use it. 10. 2GC Limited (2009), "2GC Balanced Scorecard Usage Survey 2009", "FAQ Answer: What is the Balanced Scorecard?" 11. Art Schneiderman, "The First Balanced Scorecard" 12. "The Balanced Scorecard - Measures that Drive Performance", Harvard Business Review, Feb. 1992 13. Maisel, L.S., "Performance measurement: the balanced scorecard approach", Journal of Cost Management, Vol. 6 No. 2, 1992, pp. 47-52. 14. Cobbold, I. and Lawrie, G. (2002a). "The Development of the Balanced Scorecard as a Strategic Management Tool". Performance Measurement Association 2002 15. Kaplan R.S. and Norton D.P. (2000). The Strategy Focused Organization, HBS Press, USA.	

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Course name: Statistics	
Course available with minimum number of 4 participants.	
Course code: T022	Form of class: Lecture, Laboratory, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Ściegosz Hanna, h.sciegosz@po.opole.pl	
Prerequisites: English (min B1 level), Fundamental knowledge on mathematics, an elementary course of mathematical analysis (differential and integral calculus of functions of one and several variables) and a basic course of probability.	
Objectives of the course and learning outcomes: To provide students in fundamental concepts of statistics and data mining and their applying to econometrics, edumetrics, technometrics, decision science, etc.	
Teaching program: 1. The basic goal of statistics; 2. Designing statistical experiments and collecting the data, basic sampling designs; 3. Graphical presentations of statistical data; 4. Descriptive statistics; 5. Random variables and their distributions; 6. Selected discrete and continuous distributions; 7. Point estimation and confident interval estimation; 5. Hypothesis Testing; 6. Distribution fitting; 7. Tests of normality; 8. Simple linear regression and correlation; 9. Non-linear regression.	
Assessment methods: Oral assessment, individual elaborate, final project.	
Recommended reading: 1. D. C. Montgomery, G. C. Runger, Applied Statistics and Probability for Engineers, John Wiley	

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Course name: Project Team Management	
Course code: T023	Form of class: Lecture, Seminar,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Jagoda-Sobalak Dominika, d.jagoda@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of management theory, project management, human resources management.	
Objectives of the course and learning outcomes: The aim of this course is to give the students a deeper introduction to the theory and practice of project team management. Students learn how to motivate, delegate, resolve conflicts, boost creativity of team members.	
Teaching program: 1. Staff acquisition, competence of team members (for example test Belbin); 2. Planning and organization of team work; 3. Leadership skills (Communication, Motivation, Delegating, Positivity, Trustworthiness, Creativity, Feedback, Responsibility, Commitment, Flexibility); 4. Communication in the project team; 5. Motivation in the project team; 6. Control of the project team; 7. Dysfunctions of the project team; 8. Conflict management in the project team; 9. Creative unit, creative teams and creative organization.	
Assessment methods: Lecture – oral examination, seminar - practical classes assessment.	
Recommended reading: 1. Kliem R.S, PMP.: Effective Communications for Project Management. CRC Press, 2007. 2. Young T.L.: Successful Project Management. Kogan Page Publishers, 2016. 3. Lewis J., Wong L.: Accelerated Project Management. McGraw Hill Professional, 2004. 4. Field M, Keller L.S.: Project Management. Cengage Learning EMEA, 1998.	

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Course name: Control Theory	
Course code: T024	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Pączko Dariusz, d.paczko@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level), Mathematical Analysis	
Objectives of the course and learning outcomes: The aim of the course is to derive state equations for simple circuits described by differential equations. The controllability and stability conditions of linear systems will be given. The issue of optimal control will be examined.	
Teaching program: Systems of linear differential equations, controllability and observability, Kalman decomposition, stability and stabilizability, Routh theorem, systems with constraints, minimalization of quadratic criteria, Riccati equation, the maximum principle.	
Assessment methods: Written and oral assessment, two written tests during semester.	
Recommended reading: 1. Mathematical Control Theory: An Introduction, Jerzy Zabczyk, Birkhauser, 1992; 2. Mathematical Control Theory: Deterministic Finite Dimensional Systems, Eduardo D. Sontag, Springer, 1998; 3. Mathematical Control Theory, John B. Baillieul, J. C. Willem, Springer, 1998.	

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Course name: Operational Research	
Course available with minimum number of 4 participants.	
Course code: T026	Form of class: Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Deptuła Adam, a.deptula@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level), Basic knowledge in the scope of the Management, Economics, Applications of Mathematics and Operations Research.	
Objectives of the course and learning outcomes: Knowledge in the field of linear programming and methods of supporting optimal decision making, basics of linear programming, principles of the simplex algorithm, knowledge of the construction of dual models, methods of sensitivity analysis of the optimal solution and the basis of comprehensive analysis of the optima solution.	
Teaching program: 1. The essence and genesis of operational research. Subject and methodology of operational research. Introduction to the problems of mathematical programming. 2. Linear programming. Presentation of selected decision problems in the form of linear programming tasks. 3. Organizational matters. Principles of linear programming. Construction of mathematical models of linear programming tasks. Goal function, decision variables, inequality constraints. 4. Solving sample problems of linear programming - the use of a computer program: SOLVER module EXCEL spreadsheet. 5. Solving sample problems of linear programming - using the WinQSB computer program. 6. Dual symplex method - use of a computer program: SLOVER module of EXCEL spreadsheet. 7. Transport problem. Open and closed transport issue. The transport algorithm. 8. Solving sample problems with transport - production and transport-storage issues. 9. Dependency networks - deterministic (CPM, PERT) and stochastic (GERT). Resource Optimization in dependency networks. The traveling salesman problem. 10. Practical analysis of mass service systems. Selected characteristics of mass service systems - use of a computer program: SOLVER module of EXCEL spreadsheet and WinQSB program.	
Assessment methods: Evaluation of individual presentations and also attention, laboratory report.	
Recommended reading: 1. Bretthauer KM and Côté MJ (1998) A model for planning resource requirements in health care organizations. Decision Sciences 29(1), pp. 243-270. 2. McNamee, P., J. Celona. 1990. Decision Analysis with Supertree, 2nd Edition. Scientific Press, South San Francisco, C. 3. Matheson, D., J. E. Matheson. 1999. Outside-in strategic modeling. Interfaces 29(6), pp. 29-41.	

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Course name: Mathematical Statistics	
Course available with minimum number of 4 participants.	
Course code: T027	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 4	Number of hours per semester: 60
Language of instruction: English	
Name of the lecturer and contact information: Koziarska Anna, a.koziarska@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level), basic knowledge in analysis and algebra, differentiation and integration of one variable functions.	
Objectives of the course and learning outcomes: Knowledge of the basic ideas of probability theory and its application. Knowledge and apprehension of descriptive statistic method and methods of mathematical statistics and conquest of ability of their application in practical questions. Introduction into application of STATISTICS (computer program).	
Teaching program: Descriptive statistics (measures of central tendency: mode , median , mean, measures of dispersion: range, variance, standard deviation, empirical distributions); foundation of probability theory (basic concept and definitions); random variables (discrete and continuous); discrete distributions; continuous distributions; important examples of distributions (the binomial distribution, the Poisson distribution, the normal distribution, the chi-square distribution, the t-Student distribution, the F distribution); the Central Limit Theorem; point estimation; set estimation (estimation in the normal model, estimation in the two-sample normal model); hypothesis testing (basic ideas and examples: tests in the normal model, tests in the two-sample normal model, nonparametric tests); basics of regression and correlation (linear correlation and regression as an example).	
Assessment methods: Written exam.	
Recommended reading: 1) D. C. Montgomery, G. C. Runger: Applied Statistics and Probability for Engineers, John Wiley	

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Course name: Basic in Jurisprudence	
Course available with minimum number of 4 participants.	
Course code: AL010	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Edaich Said, s.edaich@po.opole.pl	
Prerequisites: English (min B1 level), -	
Objectives of the course and learning outcomes: The course aims to give students theoretical knowledge sufficient to begin superior studies or to begin to professional life. The goal is to develop critical thinking and curiosity of students, enabling them to approach the rules and to analyze them with the basic knowledge required.	
Teaching program: Notion of law (and society). The law as a set of objective rules (objective law) Real Right and Personal Right The Characteristics of the rule of law The rule of law is imperative The rule of law is general The rule of law is permanent The law has a social purpose The fields of law a - Private law b - The public law c - Mixed law d - The private international Law e - The public international Law The Sources of Law a - Direct Sources Legislation: concept of legislation, legislation and Regulation Binding force of law Birth and death of the law The repeal of the law b - The Custom Development of custom Binding of custom c-The Jurisprudence d-The Doctrine The judicial organization The judiciary courts The courts of first instance: Civil court, penal court. The higher court: the court of appeal The Court of Cassation The Administrative Jurisdictions The Council of State Administrative tribunals The administrative courts of appeal Jurisdictions of External order The Disputes Tribunal The Constitutional Council The European Courts The Court of Justice of European Communities The European Court of Human Rights The Domain of the application of the rule of law In Space In Time.	
Assessment methods: Lecture Activity performed using audiovisual techniques, supplemented by case studies, group work and discussions with students and encouraging them actively to engage in problem solving.	
Recommended reading: -	

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Course name: Administrative science	
Course code: AL012	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Tereszkiewicz Filip, f.tereszkiewicz@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: The main objective of the course is to introduce to students basic and more detailed topics related to public administration.	
Teaching program: 1) Public administration: meaning and importance, 2) Nature and typology of public administration organisation, 3) Theory of administration, 4) Administrative management, 5) Structure of administrative organisation, 6) Development administration, 7) Public policy, 8) Bureaucratic theory, 9) Neo-classical theory (Human Relations), 10) Behavioural theory, 11) Decision-Making theory, 12) Hierarchy or scalar principle, 13) Centralisation and decentralisation of public administration, 14) Accountability and Control,	
Assessment methods: Students are expected to attend the classes and to take on active part in seminar discussions. Students will be asked to prepare one brief essay (5000 words). In order to prepare the essay students may be required to do some individual research.	
Recommended reading: • P. Sahni, E. Vayunandan, Administrative Theory, New Delhi 2010, • B. Guy Peters, J. Pierre (ed.), Handbook of Public Administration, London 2007,	

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Course name: Constitutional Law	
Course available with minimum number of 4 participants.	
Course code: AL013	Form of class: Lecture, Group tutorial, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Bartoszewicz Michał, m.bartoszewicz@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of specific legal terminology	
Objectives of the course and learning outcomes: Basic knowledge of the constitutional system of state organs in Poland as well as the basic terms of theory of constitution	
Teaching program: 1. The concept of constitution 2. Constitutionalism 3. Polish constitutions of 1921, 1935, 1952, 1997. Comparison 4. Constitutional rules and constitutional principles 5. The principle of division of power 6. The principles of the electoral law in Poland 7. Sejm and Senat. The main functions and internal structure 8. The sources of universally binding law of Poland 9. The President of Poland. The main functions and responsibility 10. The Council of Ministers – role, structure and competence. The Prime Minister 11. The constitutional principles of judicature and its structures 12. The Constitutional Tribunal. The constitutional review 13. Civil rights and liberties. Comparison on The Convention for the Protection of Human Rights and Fundamental Freedoms and the Constitution of Poland 14. Limitation of the rights and freedoms under The Convention for the Protection of Human Rights and Fundamental Freedoms and the Constitution of Poland 15. Discussion	
Assessment methods: Constant evaluation of student's work. Final test in the end of semester. Duration and test date is given on the first class	
Recommended reading: Prokop K., Polish Constitutional Law, Białystok 2011. Banaszak B., Outline of Polish Constitutional Law, Wrocław 2005	

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Course name: Diritto Costituzionale (Constitutional Law)	
Course available with minimum number of 4 participants.	
Course code: AL013/IT	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: Italian	
Name of the lecturer and contact information: Haczkowska Monika, m.haczkowska@po.opole.pl	
Prerequisites: English (min B1 level), Introduzione alla giurisprudenza / Introduction to jurisprudence	
Objectives of the course and learning outcomes: Il trasmettere agli studenti una scienza riguardante i principi del regime economico e sociale in Repubblica Polacca, dei fonti di diritti vigenti in Polonia e del sistema degli organi del potere pubblico secondo la Costituzione Della Repubblica Polacca del 1997 (K_W03, K_W04, K_W05, K_U02, K_U04, K_U06)	
Teaching program: Sistema governativo e giuridico in Polonia, i principi fondamentali, i fonti del diritto, Il separazione e divisione dei poteri, il Parlamento, il Presidente della Repubblica Polacca, il Consiglio dei Ministri, l'Amministrazione della giustizia, Corte Costituzionale, Corte dello Stato, gli organi del controllo statale, il Referendum nazionale, regionale e costituzionale, il sistema di garanzia della libert� e diritti umani e civili fondamentali	
Assessment methods: Esame orale (o lavoro scritto)- Colloquio / oral exam (or essay)	
Recommended reading: B. Banaszak, Outline of Polish Constitutional Law, wyd. UW, Wroc�aw 2005 Polish Constitutional Law. The Constitution and selected statutory materials, Chancellery of the Sejm, Warszawa 2009 L. Garlicki, Polskie prawo konstytucyjne. Zarys wy�adu, wyd. Liber, wyd. 15, Warszawa 2011 M. Bartoszewicz, M. Haczkowska, System organ�w pa�stwowych wed�ug Konstytucji Rzeczypospolitej Polskiej. Podr�cznik akademicki Opole 2010 Konstytucja RP z 2 kwietnia 1997 r. (Dz. U. z 1997 r. Nr 78, poz. 483)	

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Course name: Administrative Law I	
Course available with minimum number of 4 participants.	
Course code: AL014	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Jasińska-Biliczak Anna, a.jasinska-biliczak@po.opole.pl Tereszkiewicz Filip, f.tereszkiewicz@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of Public Administration	
Objectives of the course and learning outcomes: Provide students with knowledge of the basic problems of public administration and administrative law in National and European Contexts	
Teaching program: Approaches to Public Administration; National models of Public Administration; International and European Standards of Public Administration and Administrative Law; Sources of Administrative Law; State Administration, Governmental Administration and Central Administration; Decentralisation of Public Administration; Organ of Public Administration; Offices of Public Administration; Idea of individual administrative decision Supervision and control in Public Administration; Administrative Law in European Perspectives	
Assessment methods: oral exam or essay	
Recommended reading: - H. Izdebski, Introduction to Public Administration and Administrative Law, Liber, Warszawa 2006, - Jacek Jagielski, Administrative Law, in: Introduction to Polish Law, edited by Stanislaw Frankowski, Kluwer Law International 2006, p. 153-188.	

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Course name: Administration Law II	
Course available with minimum number of 4 participants.	
Course code: AL015	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Jasińska-Biliczak Anna, a.jasinska-biliczak@po.opole.pl Tereszkiewicz Filip, f.tereszkiewicz@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of Public Administration	
Objectives of the course and learning outcomes: Provide students with knowledge of the basic problems of public administration and administrative law in National and European Contexts	
Teaching program: Approaches to Public Administration; National models of Public Administration; International and European Standards of Public Administration and Administrative Law; Sources of Administrative Law; State Administration, Governmental Administration and Central Administration; Decentralisation of Public Administration; Organ of Public Administration; Offices of Public Administration; Idea of individual administrative decision Supervision and control in Public Administration; Administrative Law in European Perspectives	
Assessment methods: oral exam or essay	
Recommended reading: -H. Izdebski, Introduction to Public Administration and Administrative Law, Liber, Warszawa 2006, -Jacek Jagielski, Administrative Law, in: Introduction to Polish Law, edited by Stanisław Frankowski, Kluwer Law International 2006, p. 153-188	

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Course name: Fundamentals of Labour Law and Rights of Officials	
Course available with minimum number of 4 participants.	
Course code: AL020	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Edaich Said, s.edaich@po.opole.pl	
Prerequisites: English (min B1 level), -	
Objectives of the course and learning outcomes: The course aims to give students theoretical knowledge sufficient to begin superior studies or to begin to professional life. The goal is to develop critical thinking and curiosity of students, enabling them to approach the rules and to analyze them with the basic knowledge required.	
Teaching program: A - History and concepts of labor law -Definition of labor law -Collective labor law -Individual labor law -Principles of labor law B - International Organizations: - The International Labor Organization - International conference of Labors C - Institutions of labor law: - The employer - Employee - Work - Health and safety in labor place - The Syndicate D - Contracts of employment: - Parties - The subject contract. - Rights and responsibilities. - Conditions of employment. - Redemption of the employment contract. E - Safety in the Workplace: - Employee Insurance - European Agency for Safety and Health at Work (EU-OSHA) - The European Risk Observatory - Anti-discrimination - The list of acts of anti-discrimination F - The organization of labor market (in a global system). G- Civil service law - The concept of civil service law and public administration - Sources of civil service law - The concept of an official (civil servant); - Legal nature of the official position - Rights and duties of Official - The Europeanization of civil service law - The employment	

Assessment methods:

Lecture Activity performed using audiovisual techniques, supplemented by case studies, group work and discussions with students and encouraging them actively to engage in problem solving

Recommended reading:

- 1) Civil service systems in Western Europe.
A. J. G. M. Bekke, Frits M. Meer, - Editor Edward Elgar Publishing, 2000.
- 2) The New Public Service: Serving Not Steering.
Janet Vinzant Denhardt, Robert B. Denhardt, - Editor M.E. Sharpe, 2007.
- 3) Modernizing Civil Services.
Tony Butcher, Andrew Massey, - Editor Edward Elgar Publishing, 2003.
- 4) Public Management Reform: A Comparative.
Christopher Pollitt, Geert Bouckaert, 2 edition - Editor Oxford University Press, 2004.
- 5) Labour Law and Labour Market Regulation: Essays on the Construction, Constitution and Regulation of Labour Markets and Work Relationships.
- 6) The Law of Work.
Rosemary Owens, Joellen Riley, Jill Murray, 2 edition- Editor Oxford University Press, 2011.
- 7) The Future Of Labour Law.
Catherine Barnard, Simon F. Deakin, B. A. Hepple, Gillian S. Morris, - Editor Hart Publishing, 2004.
- 8) Labour Law.
Simon F. Deakin, Gillian S. Morris, 4 edition, - Editor Hart Pub., 2005.

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Course name: Statistics with Demography	
Course available with minimum number of 4 participants.	
Course code: AL027	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Polek-Duraj Kornelia, k.polek-duraj@po.opole.pl	
Prerequisites: English (min B1 level), -	
Objectives of the course and learning outcomes: After completion of this course, the student will be able to identify appropriate sources of data and perform basic demographic analyses using various techniques.	
Teaching program: •Introduction to Statistics and Demography •Basic Sources of Statistics; Collection and Processing of Demographic Data •Descriptive statistics. Measures of central tendency, measures of dispersion, measures of asymmetry. Empirical distributions and its graphics illustrations. •Regression and correlation analysis. Correlation coefficients: Pearson correlation and Spearman's rho. Scatterplot. Simple linear regression. Method of least squares. •Population Size; Age and Sex Composition; Population ageing •Marriage, Divorce, and Family Groups •Educational and Economic Characteristics •Mortality, Natality	
Assessment methods: Practical assignments and final exam.	
Recommended reading: Swanson, David, Siegel, Jacob S., Shryock, Henry S.; Methods and Materials of Demography; 2004.	

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Course name: Commercial Law	
Course available with minimum number of 4 participants.	
Course code: AL034	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Edaich Said, s.edaich@po.opole.pl	
Prerequisites: English (min B1 level), -	
Objectives of the course and learning outcomes: The course aims to give students theoretical knowledge sufficient to begin superior studies or to begin to professional life. The goal is to develop critical thinking and curiosity of students, enabling them to approach the rules and to analyze them with the basic knowledge required.	
Teaching program: Introduction: Brief history of commercial law A - Definition and principles of commercial law - Definition - Commercial Law: law of merchants or law of commercial acts. - Evolution of Commercial Law (Entrepreneurship Law), (business law). - Principles of Commercial Law. - The sources of commercial law: national sources, international sources, Custom, usage and self-regulation. B - Commercial Transactions and the Concept Merchant. - The acquisition and loss of merchant status. - The legal capacity of the merchant. - The rights and obligations of the merchant. C - The Proof in Commercial Law. D - Le "Fond de Commerce" (the Business), - The sale and transfer of "fond de commerce". E - The commercial lease, (droit de bail). F - Company Law. - definition of Company. - categories of companies. - Company contract. - Legal personality of company. - The dissolution of the company. G - The commercial contracts. H - The Competition Law (concurrency) and consumer protection. I - harmonization process of Commercial Law (UNIDROIT PRINCIPLES).	
Assessment methods: Lecture Activity performed using audiovisual techniques, supplemented by case studies, group work and discussions with students and encouraging them actively to engage in problem solving	

Recommended reading:

- 1) Commercial Law.
Cavendish. 3 edition - Editor Routledge, 2002.
- 2) Commercial Law. Robert Bradgate, Fidelma White - Editor Oxford University Press, 2007.
- 3) Commercial Law. Robert Bradgate, Fidelma White - Editor Oxford University Press, 2008.
- 4) Commercial Law.
Dobson, K. J. Reddy, Jo Reddy, 3 edition- Editor Routledge, 2003.
- 5) Commercial law. Jonathan Fitchen, 7 edition - Editor Taylor and Francis, 2010.
- 6) Commercial law
Albert H. Putney, - Editor Cee publishing company, 1909.
- 7) Commercial Law of the European Union. Gabriël Moens, John TroneTom. 4 z Ius Gentium, - Editor Springer, 2010.
- 8) commercial law: a manual of the fundamental principles governing business transactions

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Course name: Diritto commerciale (Commercial Law)	
Course available with minimum number of 4 participants.	
Course code: AL034/IT	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: Italian	
Name of the lecturer and contact information: Haczowska Monika, m.haczowska@po.opole.pl	
Prerequisites: English (min B1 level), Diritto civile/Civil Law	
Objectives of the course and learning outcomes: Il corso si propone di fornire agli studenti conoscenze teoriche sulle aziende commerciali e di aziende civile nel diritto polacco commerciale. The course aims to give students theoretical knowledge about commercial companies and civil partnership in Polish law	
Teaching program: Il concetto della società, Principi di diritto commerciale, Procura commerciale (concessione e revoca di rappresentanza commerciale) Nome azienda e casi di utilizzare un nome di affari illegalmente, Tipi di società in diritto polacco Società civile e società di persone: società in nome collettivo, società tra professionisti, società in accomandita semplice, società in accomandita per azioni Società di capitali: società a responsabilità limitata, società per azioni e società a responsabilità limitata con un unico socio Diritti e Obblighi dei soci, organi della società rapporti con i terzi e rapporti interni della società Requisiti di costituire e la liquidazione di una società The concept of the company, Principles of commercial law, Proxy and procuration (granting and revocation of commercial representation) Company name and case of use a business name illegally, Civil partnership and commercial companies: general (registered) partnership, partner company, limited partnership company, mixed joint-stock and limited company Capital company: limited liability company, joint stock company and sole shareholder limited liability company Requirements to set up a company, dissolved company and winding up of a company/	
Assessment methods: Lecture Activity, supplemented by case studies Oral exam or essay	
Recommended reading: Codice delle società commerciali, Wyd. C.H.Beck, Warszawa 2012 R. Lewandowski, Polish commercial Law: An Introduction, Wyd. C.H.Beck, Warszawa 2007	

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Course name: Accounting and Finance of Companies	
Course available with minimum number of 4 participants.	
Course code: AL041	Form of class: Lecture, Group tutorial, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Zygmunt Aleksandra, a.zygmunt@po.opole.pl Zygmunt Justyna, j.zygmunt@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of enterprise financial activity and microeconomic	
Objectives of the course and learning outcomes: Usage basics rules in financial and accountancy scope to manage enterprises and their finance	
Teaching program: National financial system in market economy. Streams and financial resources in economy. Connections between enterprise's financial system and national financial system. Finance and investment principles - outside capital and its acquisition. Cost of equity and outside capital. Investment, methods of accounting investment projects. Accounting as an enterprise informational system. Accountancy essentials and principles. Assets and capitals of enterprises - balance. Accounting transactions. Principles of accounts functioning, accounts scheme. Incomes and costs in enterprise accountancy. Financial statement as a information source of financial standing (balance reading, analysis of profit and loss account). Financial result - setting and setting of enterprise financial standing	
Assessment methods: Constant evaluation of student's work. Final test in the end of semester. Duration and test date is given on the first class	
Recommended reading: a) Curran, Accounting Fundamentals, Mcgraw-Hill 2005. b) C. Gowthroe, Business Accounting And Finance: For Non Specialists, TL 2003. c) C. Warren, J. Reeve, P. Fess, Accounting And Finance. A Firm Foundation, TL 2001. d) A. Damodaran, Applied Corporate Finance, WILEY 2006.	

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Course name: Project Management	
Course available with minimum number of 4 participants.	
Course code: AL042	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Klemens Brygida, b.klemens@po.opole.pl Szewczuk-Stępień Marzena, m.szewczuk-stepien@po.opole.pl	
Prerequisites: English (min B1 level), Theoretical preparation from other courses, i.e. Management	
Objectives of the course and learning outcomes: Students learn how to put projects into practise.	
Teaching program: - Glossary, - Definition and types of projects. - Basic parameters of projects. - Examples of big world projects. - Project life cycle. - Project initiation. - Organisation structures in projects execution. - Team selection and work division. - Methods of projects management. - Network technology. - Projects schedule. - Gantt's graph. - Costs management. - Risk in project. Cases - examples of local authority projects.	
Assessment methods: - credit based on students participation in classes, - project, - practical tasks, activity	
Recommended reading: A Guide to the Project Management Body of Knowledge, PMI 2000.	

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Course name: Teamkommunikation	
Course available with minimum number of 4 participants.	
Course code: AL047/DE	Form of class: Lecture, Group tutorial, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: Deutsch	
Name of the lecturer and contact information: Mazur-Kajta Katarzyna,	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Es werden Grundkenntnisse zu Themen des Kommunikation in Team erworben sowie der Entwicklung von Sprachkompetenzen in internationalen Teams.	
Teaching program: Während des Kurses werden nachstehende Themen besprochen: - Theorie zwischenmenschlicher Kommunikation - Kommunikation und Überzeugungskraft - Team und Integrationfähigkeit - Gesprächsführungstechniken	
Assessment methods: Um die ECTS Punkte zu erhalten muss man: - während 87% der Lektionen anwesend sein - aktiv an der Diskussion teilnehmen - den letzten Test/die Seminararbeit positiv bestehen	
Recommended reading: Deutsche Literatur (grundlegende): - Hungenberg H., Problemlösung und Kommunikation im Management: Vorgehensweisen und Techniken, Oldenbourg 2010. - Gehm T., Kommunikation im Beruf: Hintergründe, Hilfen, Strategien, Beltz, 2006. - Hömberg W., Kommunikation und Verständigung: Theorie - Empirie - Praxis, 2., Springer VS, 2012. - Heyde A., Linde B., Gesprächstechniken für Führungskräfte: Methoden und Übungen zur erfolgreichen Kommunikation, Haufe, 2003. - Mentzel W., Kommunikation: Rede, Präsentation, Gespräch, Verhandlung, Moderation, Beck im dtv, 2007. Polnische Literatur (zusätzliche): - E.Griffin, Podstawy komunikacji społecznej, Gdańskie Wydawnictwo Psychologiczne, Gdańsk 2003. - R. Cialdini, Wywieranie wpływu na ludzi, Gdańskie Wydawnictwo Psychologiczne, Gdańsk, 1999. - G. Hofstede, Kultury i organizacje. Kulturowe zaprogramowanie umysłu, PWE, Warszawa 2000. - Agryle M., Psychologia stosunków międzyludzkich, Wiedza Powszechna, Warszawa 2000. - Heller R., Kierowanie zespołem, Poradnik menadżera, Wiedza i Życie, Warszawa 2000.	

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Course name: International Law	
Course available with minimum number of 4 participants.	
Course code: DAL005	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Edaich Said, s.edaich@po.opole.pl	
Prerequisites: English (min B1 level), -	
Objectives of the course and learning outcomes: The course aims to give students theoretical knowledge sufficient to begin superior studies or to begin to professional life. The goal is to develop critical thinking and curiosity of students, enabling them to approach the rules and to analyze them with the basic knowledge required.	

Teaching program:

A - Introduction, and Approaches to International Law:

What is International Law?

International (Community) Order.

International law definition

International Law and Domestic law.

Sources of international law

(international treaties, custom, and general principles of law).

B - Topics in International Law:

☐ Human Rights Law.

☐ International Environmental Law.

☐ International Criminal Law.

☐ International Economic Law.

C - Principles of International Law.

the Concepts of Fundamental Principles of International Law.

a-principle of national sovereignty. b-the principle of self-determination of peoples.

c-the fulfillment of international obligations.

D - Subjects of International Law

a- the State

☐ legal elements of the State

☐ classification of States

☐ formation of State

☐ recognition of states

☐ fall of states

☐ succession of States

b- Other Subjects of International Law.

☐ autonomous Territories

☐ community insurgent

c- International Organizations

☐ classification of international organizations.

☐ statutes of international organizations

☐ membership of international organizations

☐ vote and resolutions of international organizations

E - International Agreements

☐ concepts and classification of international agreements

☐ conclusion of international agreements

☐ duration and implementation of international agreements

☐ invalidity, and expiration of international agreements

F - International Disputes

☐ concepts and classification of international disputes

☐ diplomatic means of settling international disputes

☐ The judicial means of settling international disputes

G - Armed Conflict

☐ concepts and classification of armed conflicts

☐ Prevention of armed conflict

☐ regime of armed conflict

End of armed conflict

Assessment methods:

Lecture Activity performed using audiovisual techniques, supplemented by case studies, group work and discussions with students and encouraging them actively to engage in problem solving

Recommended reading:

- 1) International Law
Malcolm Nathan Shaw. 5 edition, Editor Cambridge University Press, 2003.
- 2) Modern Introduction to International Law, (International politics/Public international law).
Peter Malanczuk, Michael Barton Akehurst Redactors Peter Malanczuk, Michael Barton Akehurst, 7 edition, Editor Routledge, 1997.
- 3) International law. Autor Alan Vaughan Lowe, Clarendon law series. Editor Oxford University Press, 2007.
- 4) International law.
Antonio Cassese. Editor Oxford University Press, 2001.
- 5) The Settlement of Disputes in International Law: Institutions and Procedures.
John Collier, Vaughan Lowe. Editor Oxford University Press, 2000.
- 6) Principles of public international law.
Ian Brownlie. 2 ed, Editor Clarendon Press, 1973.
- 7) International law
Valerie Epps. 2 edition, Editor Carolina Academic Press, 2001.
- 8) International Law: Examples

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Course name: System of local government	
Course code: DAL030	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Tereszkiewicz Filip, f.tereszkiewicz@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: The main objective of the course is to introduce students to basic and more detailed topics related to the local governments in Poland and other European countries.	
Teaching program: 1) The local government system: an introduction, 2) Structure and territory, 3) The functions of local authorities, 4) Finance and its control, 5) Local government and the State, 6) Policy making and democracy, 7) Leaders and the party system, 8) Bureaucracy and employees, 9) Patterns of government, 10) Local democracy, 11) Regional and local government in Poland,	
Assessment methods: Students are expected to attend the classes and to take on active part in discussions. Students will be asked to prepare one brief essay (5000 words).	
Recommended reading: • C. Panara, M. Varney (ed.), Local Government in Europe. The "fourth level" in the EU multilayered system of governance", Abingdon 2013, • A. Coulson, A. Campbell (ed.), Local Government in Central and Eastern Europe. The Rebirth of Local Democracy, Abingdon 2008, • P. John, Local Governance in Western Europe, Manchester 2001, • J. A. Chandler, Local government today, Manchester 2001,	

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Course name: System of human rights protection	
Course available with minimum number of 4 participants.	
Course code: DAL032	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Zamelski Piotr, p.zamelski@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Introduction to the concept of human rights, underlying values and the modern catalogues of human rights. Introduction to the systems of the legal protection of human rights. Developing the ability to use legal texts. Developing skills in the field of assessing factual and legal phenomena.	
Teaching program: Organisational classes. The place of human rights protection in the legal system. Human rights from the philosophical and historical perspectives. Human rights protection systems – concept, division and structure. The generations of human rights and the basic values of human rights protection. Human rights protection in the Constitution of the Republic of Poland. Authorities and procedures in human rights protection at the national level. General information on the international protection of human rights. The universal system of human rights protection – legal basis and institutions. The universal system of human rights protection – control procedures. The European system of human rights protection – legal basis and institutions. The European system of human rights protection – control procedures. Human rights protection in the European Union. Non-European systems of human rights protection. The meaning of obligations in human rights protection. Obtaining credits for classes.	
Assessment methods: Oral examination	
Recommended reading: B. Gronowska, T. Jasudowicz i in., Prawa człowieka i ich ochrona, Wyd. II, Toruń 2010. J. Hołda, Z. Hołda i in., Prawa człowieka. Zarys wykładu, Kraków 2004. S. L. Stadniczeńko, Propedeutyka praw człowieka, Opole 2010, 2011. Forma i warunki zaliczenia przedmiotu: B. Banaszak, System ochrony praw człowieka, Kraków 2005. M. Jabłoński, S. Jarosz-Żukowska, Prawa człowieka i systemy ich ochrony, Wrocław 2004. I. Malinowska, Ochrona praw i wolności w Polsce, Warszawa 2009. F. J. Mazurek, Godność osoby ludzkiej podstawą praw człowieka, Lublin 2001. P. Zamelski, Równowaga praw i obowiązków implikacją zasady dobra wspólnego, Lublin 2014. T. Landman, Protecting Human Rights. A Comparative Study, Georgetown University Press 2005.	

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Course name: Law and non-governmental organizations	
Course available with minimum number of 4 participants.	
Course code: DAL048	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Zamelski Piotr, p.zamelski@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Introduction to the concepts and types of non-governmental organisations. Introduction to the basic forms of activities of non-governmental organisations. Developing the ability to use legal texts. Developing skills and knowledge in the field of the rules of the functioning of non-governmental organisations.	
Teaching program: Lectures: 1. Organisational classes. The concepts of non-governmental organisations and the third sector. 2. The role of non-governmental organisations in social life. 3. Legal regulations concerning associations. 4. Legal regulations concerning foundations. 5. Public Benefit Activities. 6. The legal status of public benefit organisations. 7. The implementation of public tasks by non-governmental organisations. 8. The revenue of non-governmental organisations. 9. The revenue of non-governmental organisations – the performance of civil-law agreements. 10. Hiring employees and reporting in non-governmental organisations. 11. Public relations in non-governmental organisations. 12. Examples of non-governmental organisations. 13. Other social organisations – cooperatives. 14. Other social organisations – labour organisations. 15. Obtaining credits for the course. Practice exercises: 1. Organisational classes. Acquainting students with the topic of the course. 2. The forms of non-governmental organisations' activity in social life. 3. Association Law – legal text analysis. 4. Association Law – writing a statute of an association. 5. Act on foundations – legal text analysis. 6. Act on foundations – writing a statute of a foundation. 7. The Public Benefit and Volunteer Work Act – text analysis. 8. Drawing up a bid for the implementation of a public task. 9. Drawing up an agreement for the implementation of a public task. 10. The legal aspects of voluntary service. Drawing up an agreement for voluntary service. 11. Hiring employees in non-governmental organisations – practice. 12. Reporting in non-governmental organisations – practice. 13. The selected tax-related and procedural aspects of non-governmental organisations. 14. Obtaining credits for the course.	
Assessment methods: Oral examination	

Recommended reading:

Association Law.

Act on foundations.

Public Benefit and Volunteer Work Act.

Cooperative Law.

The Labour Unions Act.

The Economic Local Government Act.

M. Edwards, D. Hulme, Non-governmental organizations. Performance..., Earthscan 1995.

M. Załuska, W. Toczyński i in., Organizacje pozarządowe w społeczeństwie obywatelskim, 1996.

D. Lewis, N. Kanji, Non-Governmental Organizations and Development..., 2009.

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Course name: Diplomatic Protocol in Public Administration	
Course code: DAL050	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Tereszkiewicz Filip, f.tereszkiewicz@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: The main objective of the course is to introduce students to basic and more detailed topics related to etiquette and diplomatic protocol in public administration, especially: etiquette, official correspondence, cocktail and dinner parties, dress codes, organisation of official visits and protocol in international organisations.	
Teaching program: 1. Diplomatic protocol – general rules as well as rules specific to the European Union. 2. Cultural differences in a diplomatic framework. 3. Organization of ceremonial, official and occupational visits. 4. Organization of receptions, meetings and conferences, 5. Etiquette: courtesies, savoir-vivre, beverages, dress codes. 6. Language used in official mail. 7. Participation in a formal and official events.	
Assessment methods: Students are expected to attend the classes and to take on active part in seminar discussions. Students will be asked to prepare one brief presentations (20 minutes) about etiquette.	
Recommended reading: - Foster D.: Global Etiquette Guide to Europe: Everything you Need to Know for Business and Travel Success, Wiley 2000, - I. Roberts (ed.), Satow`s Diplomatic Practice, Oxford 2009, - E. Post, Emily Post on Etiquette, London 1995, - L. Hunt Chaney, J. Martin, The Essential Guide to Business Etiquette, Westport 2007.	

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Course name: European Law	
Course available with minimum number of 4 participants.	
Course code: DAL053	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Edaich Said, s.edaich@po.opole.pl Haczkowska Monika, m.haczkowska@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Provide students with knowledge of the principles of the legal system, economic and social system of the European Union, the sources of EU law, the system of institutions regulated in the EU treaties	
Teaching program: Legal nature, objectives and principles of the EU; the sources of EU law; principle of primacy of EU law, principle of direct effect, principle of subsidiarity and proportionality, principle of liability of the Member States; direct actions and preliminary question to the EU Court of Justice; the law -making procedures; freedom of the EU Treaty; EU competition law Legal nature, objectives and principles of the EU; the sources of EU law; principle of primacy of EU law, principle of direct effect, principle of subsidiarity and proportionality, principle of liability of the Member States; direct actions and preliminary question to the EU Court of Justice; the law -making procedures; freedom of the EU Treaty; EU competition law	
Assessment methods: oral exam or essay	
Recommended reading: Il Trattato dell'UE (1992) il Trattato sul funzionamento dell'Unione Europea Adam, Tizzano, Lineamenti di diritto dell'Unione Europea, 2. ed. Torino, Giappichelli, 2010 Daniele, Diritto dell'Unione europea, 4. ed., Milano, Giuffrè, 2010 Cannizzaro, Mastroianni, Sbolci, Diritto dell'Unione europea, Parte speciale, Estratto (a cura di Strozzi), 3 ed., Torino, Giappichelli, 2010	

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Course name: Diritto europeo	
Course available with minimum number of 4 participants.	
Course code: DAL053/IT	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: Italian	
Name of the lecturer and contact information: Haczkowska Monika, m.haczkowska@po.opole.pl	
Prerequisites: English (min B1 level), Conoscenze di base dello Stato e Diritto	
Objectives of the course and learning outcomes: Fornire agli studenti una conoscenza dei principi del sistema giuridico, economico e sociale del Unione Europea, le fonti del diritto in UE, il sistema di istituzioni specificato in trattati di UE	
Teaching program: Natura giuridica, gli obiettivi e i principi di base dell'UE; fonti del diritto comunitario; principio del primato del diritto comunitario, principio dell'efficacia diretta, principio di sussidiarietà e di proporzionalità, principio della responsabilità degli Stati membri; querelle dirette e questione pregiudiziale alla Corte di Giustizia dell'UE; le procedure di legge per il processo decisionale; la libertà dell Trattato UE; diritto della concorrenza in UE	
Assessment methods: Esame orale o lavoro scritto	
Recommended reading: Il Trattato dell'UE (1992) il Trattato sul funzionamento dell'Unione Europea Adam, Tizzano, Lineamenti di diritto dell'Unione Europea, 2. ed. Torino, Giappichelli, 2010 Daniele, Diritto dell'Unione europea, 4. ed., Milano, Giuffrè, 2010 Cannizzaro, Mastroianni, Sbolci, Diritto dell'Unione europea, Parte speciale, Estratto (a cura di Strozzi), 3 ed., Torino, Giappichelli, 2010	

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Course name: Society and culture of Europe	
Course code: DAL055	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Edaich Said, s.edaich@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Course description: culture-territorial identities on subsequent levels: local, regional, national, international, European. Identity cultivation of minority groups according to ethnicity, religion, life style, sexual orientation and other socially crucial and culturally significant criteria. Prejudices and their alterations. Intercultural dialogue. Alterations of collective cultural identities. Common European identity and its relations to European democratic civil society. Understanding of ethic norms and diversities in their understanding. The education effects – skills and abilities: understanding of national identity understanding of European integration processes seen as culture and identity categories; analysis of identity models (with prejudices) as dynamic cultural phenomenon. Understanding the differences between European countries	
Teaching program: Week 1-5 Introduction in humanistic and social sciences. Introduction in the research methods. Week 6 „Construction of a nation”, - theories of nation Week. 7 From tribes and ethnic symbols to state symbols. Week. 8 The role of myths in the building of community. Week. 9 Identity in modern Europe. National stereotype. Being Polish Week. 10 Family and its evaluation. Divorces in Europe and Poland. Week. 11 The place of men and women in the European society Week. 12 Masculinity and femininity: The taboo dimension of national cultures Week 13 Using color. From the old masters to the modern advertisement. Week. 14 Sex and body in the advertisement and art. Week 15 Between the authorities' control over the content and dissemination of information, and a ban on some publications for fear that some disorderly content might be printed. Censorship in Europe The students have to read set texts and be prepared to discussion. The final grade in 90% depends on the grade obtained in report from the research work.	
Assessment methods: Group project, report from research work and its presentation	

Recommended reading:

Babbie, E. R. (1998). The practice of social research. International Thomson Publishing Services.
Babbie, E. R. (2013). The basics of social research. Cengage Learning.
Chester, R. (2012). Divorce in Europe (Vol. 3). Springer Science

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Course name: Kultura języka - Gomanitarnyj przedmiot I	
Course available with minimum number of 4 participants.	
Course code: DEKL006/R	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: Russian	
Name of the lecturer and contact information: Rajchel Anna , a.rajchel@po.opole.pl	
Prerequisites: English (min B1 level), - Znanije gramatiki, punktuacji, syntaksjisa - Citanije s ponimanijem	
Objectives of the course and learning outcomes: - Kriticeskij analiz tiekstow - Podbor prawilnych slow w kontaktach s drugimi - Otwietstwiennieje polzowanije internetom	
Teaching program: - Jazykowaja norma, jazykowaja oszybka - Etika I estetika jazyka - Jazykowaja moda - Tipičnyje jazykowyje oszybki - Tipy orfograficeskich oszybok - Punktucyonnyje oszybki - Jazyk sowriemiennoj molodioży - Kultura jazyka w Internetie - Jazyk riekłamy	
Assessment methods: Prezentacja, diskussja	
Recommended reading: - Bolszoi slowar polsko-russkij, russko-polski - T. Karpowicz, Kultura języka polskiego. Wymowa, ortografia, interpunkcja, Warszawa 2009 (T. Karpowicz Kultura polskiego języka. Proiznoszenije,orfografia,punktuacja, Warszawa 2009). - Markowski, Błędy leksykalne, frazeologiczne i słowotwórcze, Warszawa 2014. (A. Markowski, Oszybli lieksicieskije, frazeologiceskije i slowoobrazowatielnije, Warszawa 2014). - Polszczyna XX wieku. Ewolucja i perspektywy rozwoju, pod red. S. Dubisza i S. Gajdy, Warszawa 2001 (Polski język XX stolietija. Ewolucija i pierspektiwy razwitija, red. S. Dubisz i S. Gajda, Warszawa 2001). - Etyka i etykieta w komunikacji językowej, pod red. A. Piotrowicz, M. Witaszek-Samborskiej i K. Skibskiego, Poznań 2012. (Etika i etikiet w jazykowom soobścienii pod red. A. Piotrowicz, M. Witaszek-Samborskiej i K. Skibskiego, Poznań 2012	

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Course name: Nacyonalnyje mieńszynstwa w Europie - Gumanitarnyj przedmiot II	
Course available with minimum number of 4 participants.	
Course code: DEKL007/R	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: Russian	
Name of the lecturer and contact information: Kalczyńska Maria, m.kalczyńska@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: CELI I ZADACI: Oznakomit studentow s osnovnymi problemami w otnoszenii nacyonalnych meńszynstw w Europie: Genezys koncepcji, mestopolożenia, typologii. Analiz osnovnych praw i zaścicy mieńszynstw w europejskich dokumentach. Obsuźdzenia instituta poddierżki nacyonalnych meńszynstw w Europie . Obsudit spieczifiku nacyonalnych meńszynstw, prożywajuścich w Polsce i sosjesnich stranach Centralnoj i Wostocznoj Europy i Zapadnoj Europy. Dla polnoty jawlienije także jawlajetsa ważnym aspektom polskoj diaspory w kontiektstie woprosa o mieńszynstwach w Europie. Kromie tego, opisanije praw nacyonalnych mieńszynstw razwiwat swoju sobstwiennuju kulturu, jazyk, tradycyi, dostupa k sriedstwam masowoj informacii. Ssylka na tiekuściju situacuju immigracji i bieźencow iz trietich stran w Europie. Celju - ocenka jawlenia w kontiektstie multikulturizma kontinienta i pierspiektiwach sotrudniciestwa so stranami mieńszynstw, żywuścich w dwadcat pierwom stoletii.	
Teaching program: Tiemy: - Osnownyje poniatija: narod, minoritarnyje, etnicieskich mieńszynstw, multikulturalizm, udostowierienija, etnicieskoj diaspory. Gieograficieskoje izmierienije, ekonomicieskoje, politicieskoje, kulturnoje i etnicieskoje. - Nacyonalnyje mieńszynstwa w Europie. Tipologia i raspriedielienije. - Europejskije standarty dla zaścicy i poościenija praw mieńszynstw. Ućrieźdzenija zaścicy: Europejskij sojuz, OZN, OBCE, JUNESKO, Sowiet Europy - Nacyonalnyje mieńszynstwa w Europie: Giermania (aspekt Silezja) - Etnicieskije mieńszynstwa w Polsce i sosiednich stranach: Cyganie, Karaimy, Liemki - Etnicieskije mieńszynstwa w Polsce i sosiednich stranach: Armianie, Tatary, Jewriei - Nacyonalnyje mieńszynstwa w Polsce i sosiednich stranach: Litowcy Ukraincy, Bielorusy - Nacyonalnyje mieńszynstwa w Polsce i sosiednich stranach: Czechy, Slowaki - Mieńszynstwa i polskoj diaspory w Centralnoj i Wostocznoj Europie - Mieńszynstwa i polskoj diaspory w Zapadnoj Europie - Nacyonalnyje mieńszynstwa w Zapadnoj Europie - Kultura, obrazowanie, religija, miedija nacyonalnych mieńszynstw w Europie na wybranych primierach	
Assessment methods: Miedodist: liekcyja, multimedia prezentacji, analiz istocznikow i dokumentow Forma i kriterii woprosa: okonczatielnije, ustnyje ili pismiennije	

Recommended reading:

LITERATURA:

- Kresowianie na Śląsku Opolski, pod red. M. Kalczyńskiej, Opole 2011
- Kultura mniejszości narodowych i etnicznych w Europie, pod red. Z. Jasińskiego, Opole 2004
- Mniejszości narodowe i etniczne – edukacja i kultura, Materiały z Colloquium Opole 2007, Opole 2008
- Mniejszości polskie i Polonia w ZSRR, pod red. H. Kubiaka, Wrocław 1992
- Ochrona praw osób należących do mniejszości narodowych, Warszawa 1995
- Polska diaspora, pod red. A. Walaszka, Kraków 2001
- Ślązacy w Niemczech po 1945 r. pod red. M. Kalczyńskiej, Opole 2009
- Zybura M., Niemcy w Polsce, Wrocław 2001.
- Waldenberg Marek, Narody zależne i mniejszości narodowe w Europie Środkowo-Wschodniej, Warszawa 2000
- Bieżąca prasa

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Course name: Leadership and the art of creative thinking	
Course available with minimum number of 4 participants.	
Course code: DEKM024	Form of class: Lecture, Group tutorial,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Klemens Brygida, b.klemens@po.opole.pl	
Prerequisites: English (min B1 level), -	
Objectives of the course and learning outcomes: Students learn how to use creative thinking in the process of learning and in the work. Learn how to be leader.	
Teaching program: - Glossary, etymology, - History of the art of creative thinking, - History of leadership, - Measuring creativity, - The main techniques of creative thinking (mind mapping, creative ABC technique, brainstorm, brain writing, fish-bone technique, 635 technique, etc.) – practical exercises, - The art of public speech, - Time management, - Leadership styles and theories, - Leadership myths.	
Assessment methods: credit based on students participation in classes, final written test, activity	
Recommended reading: Buzan T., The Memory Book, BBC Publications, 2010. Buzan T., The Mind Map Book, 1993. Florida, R., The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community and Everyday Life. Basic Books, 2002.	

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Course name: Regional and international marketing	
Course available with minimum number of 4 participants.	
Course code: DEKM050	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Klemens Brygida, b.klemens@po.opole.pl	
Prerequisites: English (min B1 level), -	
Objectives of the course and learning outcomes: Students learn: about the role of marketing in regional development, how to improving the image of a region, about modern trends in marketing, etc.	
Teaching program: Glossary: region, regional development, marketing, international level, etc.; The concept of marketing, Marketing environment; Marketing as regional development approach; Why regions try to build it's own vision? Increasing the attractiveness of a city and region; Strategic market planning process; Advertisement and PR; Improving the image; Case studies of regional and international marketing; Modern trends in marketing	
Assessment methods: - group work and discussions with students, - audiovisual techniques, - case studies, - problem solving.	
Recommended reading: A. Gilmore, Services marketing and management, Sage Publications, 2003; H. Jansson, International Business Marketing in Emerging Country Market, 2007; F. Kero, Regional Marketing and the Strategic Market Planning Approach to Attract Business and Industry Case Study, California 2002.	

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Course name: Основания личного развития	
Course available with minimum number of 4 participants.	
Course code: DMSGLO06/R	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: Russian	
Name of the lecturer and contact information: Rajchel Anna , a.rajchel@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Цель предмета - познакомление студентов с основными понятиями из сферы психологии, педагогики и т.д., которое можно использовать в управлении человеческими ресурсами. Работа человеческого мозга и его функции в процессе изучения, типы интеллигенции по Гарднеру, различие между уговорами и манипуляцией, креативность в управлении. Это основная проблематика лекции.	
Teaching program: 1. Теории личности 2. Личность и темперамент 3. Невербальный сообщение 4. Уговоры и манипуляция 5. Чувства и эмоции 6. Креативность 7. Мозг человека: строительство, функции 8. Стереотипы и предупреждения	
Assessment methods: test	
Recommended reading: 1. Twórczość, kreatywność, innowacyjność: wybrane zagadnienia. (Творчество, креативность, инновационность: выбранные вопросы), red. nauk. M. Kuśpił, A. Tychmanowicz, J. Zdybel, Wydawnictwo Uniwersytetu Marii Curie-Skłodowskiej, Lublin 2015. 2. P. G. Zimbardo, R. J. Gerrig, Psychologia i życie, (Психология и жизнь) PWN, Warszawa 2006. 3. P.G. Zimbardo, R. L. Johnson, V. McCann, Psychologia: kluczowe koncepcje, 4. Psychologia osobowości, (Психология: ключевые концепции, 4. Психология личности) PWN, Warszawa 2015. 4. S. Szuman, Osobowość i charakter, (Личность и характер) PWN, Kraków 2014. 5. J. Strelau, Psychologia temperamentu, (Психология темперамента) PWN, Warszawa 2002.	

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Course name: Production and Services Management	
Course code: DZL001	Form of class: Lecture, Laboratory, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 7	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Jurczyk-Bunkowska Magdalena,	
Prerequisites: English (min B1 level), English (min B1 level), Basic knowledge of Marketing and Financial Management.	
Objectives of the course and learning outcomes: The aim of this course is to provide the students with a knowledge base on how to develop and run businesses more efficient. During the course the students will be introduced to terms, methods, and current research topics within the field of operation management. Although the main focus in the course is industry, almost all methods are general and therefore applicable in service trades like the hotel industry, consulting, hospitals, public services etc. Students will understand the principles and practice of factors which influence the capacity to compete effectively in manufacturing and service operations.	
Teaching program: The Production and Operations Function and the Organisation, Production/Operations Strategy, Planning and Controlling the Operations, Production/Operations Management Production/Operations Management in Manufacturing and Service Environments, Marketing and Product/Service Design, Product/Service: Variety and Value, Quality, Reliability, Product, Service, Operations and Competitive Strategies, Location and Design of the Plant or Facilities, Layout of the Facilities, Equipment Selection, Maintenance of the Facilities and Equipment, Production/Operation Systems Design, Work Measurement, Operations Control: An Introduction, Forecasting, Capacity Management and Operations Scheduling, Manufacturing Planning Case Study, Data Capture and Release, Inventory Management, Manufacturing Planning and Control Systems, Project Management, Resource Allocation – Linear Programming, Purchasing, Despatch.	
Assessment methods: Lecture – oral examination; seminary participation; laboratory completion of individual project assignments.	
Recommended reading: 1. Gideon Halevi: Handbook of Production Management Methods, Butterworth Heinemann, 2001; 2. Keith Lockyer, Alan Muhlemann, and J.S. Oakland: Production and Operations Management, Financial Times/ Prentice Hall; 3. Donald Waters: Operations Management. Producing Goods and Services Financial Times/ Prentice Hall (now 2th edition); 4. Eliyahu M. Goldratt and Jeff Cox The Goal: A Process of Ongoing Improvement, Gower Publishing Ltd; 5. Chase, Richard B. (2006). Operations management for competitive advantage. McGraw-Hill/Irwin; 11 edition; 6. David Ray Anderson Dennis J. Sweeney Thomas Arthur Williams (2008): An Introduction to Management Science: Quantitative Approaches to Decision Making, South-Western Educational Publishing.	

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Course name: Stress Management	
Course code: DZL002	Form of class: Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 1	Number of hours per semester: 15
Language of instruction: English	
Name of the lecturer and contact information: Karczewski Leszek, l.karczewski@po.opole.pl	
Prerequisites: English (min B1 level), no prerequisites	
Objectives of the course and learning outcomes: The course aims at giving students theoretical knowledge about causes of individual and organizational stress , their origins and ways to counteract them. After the course a student should be able to improve skills within various intelligences, including emotional one and also contribute to the creation of an organizational culture of trust, responsibility and security.	
Teaching program: Intoduction, Types and genesis of stress, burnout, Emotional and moral intelligence and stress, Counteracting stress at the individual level. Work organization, the art of relaxation, Counteracting stress in organizational activities. Creating an organizational culture of responsibility, trust and security	
Assessment methods: Lecture Activity performed using audiovisual techniques, supplemented by case studies, group work and discussions with students and encouraging them actively to engage in problem solving	
Recommended reading: Literature: 1. Goleman D., Emotional Intelligence: Why It Can Matter More Than IQ, Bantam Books, NY 1996. 2. Quick J.C., Quick J.D., Nelson D.L., Hurrell J.J. Preventive stress management in organisations. Washington, DC, American Psychological Association. 1997. 3. Cooper R. , A. Savaf, Executive EQ, Emotional intelligence i Leadership and organizations, Advanced Intelligence Technologies, LLC, 1997. 4. Ivancevich J.M., Matteson M.T., Freedman S.M., Philips J.S. Worksite Stress Management Interventions. American Psychologist, 45, 1990. 5. Lynn A.B. The Emotional intelligence activity book., Amacom Books 2002.	

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Course name: Sustainable Regional Development-monographic lecture I	
Course available with minimum number of 4 participants.	
Course code: DZL029	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Rokita-Poskart Diana, d.rokita@po.opole.pl	
Prerequisites: English (min B1 level), -	
Objectives of the course and learning outcomes: Developing a full awareness and awakening public interest of interrelated economic, social, political and environmental issues. Allowing everyone to acquire the knowledge and skills necessary for environmental improvement. Creating new patterns of behavior, shaping attitudes, values and beliefs of individuals, groups and societies, taking into account the concern for environmental quality	
Teaching program: Explain the basic concepts of ecology, ecological education and environmental protection, Ethical and sociological aspects of ecology and environmental protection: - Environmental education, - Methods of social psychology in shaping the ecology of human attitudes, - Environmental awareness, - Shallow and deep ecology, Environmental education as an international obligation, Organization of environmental education in Poland Basis for environmental protection (including the basic threats and challenges of the modern world, the evolution of approaches to issues of ecology and environmental management model) Cleaner Production as a philosophy and strategy of environmental protection Models and definitions found in the conservation and environmental management, Renewable and non-renewable resources of the environment and the rational exploitation	
Assessment methods: ---	
Recommended reading: Harrison Paul, The Third Rewolution. Environment, Population and a Sustainable World, I.B. Tauris/Penguin Books, London-New York, 1992, Martell, Luke, Ecology and Society: An Introduction, Polity Press, 1994, Michael Tobias ed, Deep Ecology, Avant Books, ISBN 0-932238-13-0, 1988, Palmer, J.A., Environmental Education in the 21st Century: Theory, Practice, Progress, and Promise, Routledge, 1998, Sawin Janet, Charting a New Energy Future, State of the World 2003, By Lester R. Brown. Boston: W. W. Norton	

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Course name: Diversity management	
Course code: DZM001	Form of class: Lecture, Group tutorial,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Maj Jolanta, j.maj@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level)	
Objectives of the course and learning outcomes: This course provides insights and experience into diversity management. Course objectives are to: Provide an understanding of the key issues of diversity management as well as intersections with other strategies: HRM, CSR. Learn and apply key elements of diversity management. Understand the business case of diversity management. Understand differences between diversity management, equal rights and equal treatment.	
Teaching program: 1. Fundamentals of diversity	
Assessment methods: Constant evaluation of student's work. Final test in the end of semester.	
Recommended reading: Harrison, D. A.,	

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Course name: Ethics in management	
Course available with minimum number of 4 participants.	
Course code: DZM004	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Karczewski Leszek, l.karczewski@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Upon successful completion of this Ethics in Management course, the student will be able to: - Demonstrate understanding of the definition of ethics and the importance and role ethical behavior serves in management and in the business world today. - Identify various ethical issues that occur in the workplace. - Evaluate the concept of Corporate Social Responsibility, and explore its relevance to ethical business activity.	
Teaching program: - The Nature of Moral Problems in Management - Moral Analysis and Economic Outcomes - Moral Analysis and Legal Requirements - Moral Analysis and Ethical Duties - Why Should a Business Manager Be Moral? - How Can a Business Organization Be Made Moral?	
Assessment methods: Written exam	
Recommended reading: LaRue T. Hosmer, The ethics of management, 2010.	

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Course name: Psychology of management	
Course available with minimum number of 4 participants.	
Course code: DZM027	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Polek-Duraj Kornelia, k.polek-duraj@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: The students will obtain a firm grounding in several basic areas of psychology and research methodology. Within the program, the student is expected to become competent in theory, research, and applications of psychology as they relate to management. The program emphasizes the contributions of psychology to the understanding of people in their world of work. Training is received in the conduct of basic and applied research, and in the applications of theory and research to organizational and human resource management problems in organizations.	
Teaching program: - Introduction to Psychology of Management - Employee Selection: Recruiting and Interviewing, References and Testing. Evaluating Selection Techniques and Decisions - Evaluating Employee Performance - Designing and Evaluating Training Systems - Employee Motivation - Employee Satisfaction and Commitment - Organizational Communication - Leadership - Group Behavior, Teams, and Conflict - Stress Management: Dealing with the Demands of Life and Work	
Assessment methods: Written exam	
Recommended reading: Michael G. Aamodt, Industrial/Organizational Psychology: An Applied Approach	

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Course name: Optimization in logistics	
Course available with minimum number of 4 participants.	
Course code: DZM057	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Szewczyk Mirosława, m.szewczyk@po.opole.pl	
Prerequisites: English (min B1 level), This course is intended for students who have a limited background in mathematics.	
Objectives of the course and learning outcomes: Upon completion of this course, you will be able to formulate, analyze, and solve models that represent real-world problems.	
Teaching program: Fundamentals of linear programming. Introduction to Win QSB software. Simplex algorithm. Integer programming. Binary programming. Network modeling (network flow, transportation problem, assignment problem, shortest path problem, maximal flow problem, minimal spanning tree, traveling salesman problem). Inventory theory and system. Facility location and layout. Queuing analysis. Nonlinear programming	
Assessment methods: Exam	
Recommended reading: Hillier, F. S. and Lieberman, G. J. Introduction to Operations Research, 8th ed., New York: McGraw-Hill, 2005.	

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Course name: Microeconomics	
Course available with minimum number of 4 participants.	
Course code: EKL008	Form of class: Lecture, Group tutorial, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Jasińska-Biliczak Anna, a.jasinska-biliczak@po.opole.pl Rokita-Poskart Diana, d.rokita@po.opole.pl	
Prerequisites: English (min B1 level), -	
Objectives of the course and learning outcomes: Understanding the basic microeconomics category, understanding principles of function the main subjects in the economy of public system , understating to influence of economy system on management area	
Teaching program: Nature of microeconomics, consumer behavior and individual demand, market demand, optimal input combinations and cost functions, market structure, price and output (perfect competition, monopoly, monopolistic competition, oligopoly)	
Assessment methods: On the basis of participation in discussions	
Recommended reading: N.G. Mankiw , Principles of Microeconomics, O'Sullivan, S. Sheffrin, St. Perez, Microeconomics: Principles, Applications, and Tools C. R. McConnell Microeconomics	

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Course name: Mathematics	
Course available with minimum number of 4 participants.	
Course code: EKL011	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Szewczyk Mirosława, m.szewczyk@po.opole.pl	
Prerequisites: English (min B1 level), This course is intended for students who have a limited background in mathematics.	
Objectives of the course and learning outcomes: This course introduces students to the mathematical language, skills and techniques necessary for success in many of today's fields. Emphasis is placed on applications in business. Developing skills of view expression on the basis of mathematical conceptions, symbols and terms.	
Teaching program: 1. Review of fundamental 2. Matrices. Operations on matrices. Determinants and matrix inversion. 3. Systems of linear equations. Systems of linear inequalities. 4. Relations and functions. 5. Sequences, series and limits. 6. Differentiation (function of one variable). 7. Optimization 8. Differentiation (function of more than one variable) 9. Integration. 10. Differential equation.	
Assessment methods: Practical assignments. Final exam.	
Recommended reading: M. Timbrell, Mathematics for economists: an introduction, Blackwell, Oxford 1990. M. Rosser, Basic Mathematics for Economists, Routledge, London 2003. V. C. Mavron, T. N. Phillips, Elements of Mathematics for Economics and Finance Springer-Verlag, London 2007	

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Course name: Economic Analysis	
Course available with minimum number of 4 participants.	
Course code: EKL022	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Zygmunt Aleksandra, a.zygmunt@po.opole.pl Zygmunt Justyna, j.zygmunt@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of enterprise financial activity and microeconomy	
Objectives of the course and learning outcomes: Understanding and usage of methods and analytical techniques in enterprises activities. Interrelationship results of economic analyses with decision system in enterprise.	
Teaching program: Methodical basics of economic analyses. Conditions and bases of interpretation and presentation results of economic analyses. Information sources in economic analyses scope. Economic analysis enterprises – balance sheet and cash flow, rates analyses. Analysis: production, costs, employment, sale, prices. Business plan and enterprise's strategy. Economic projects estimation. Estimation of investment efficiency. Accounting techniques of measurement investment projects. Discount rate. Quantitative and qualitative methods in branches and markets analyses. Prices deformities and calculation prices of commercial and non commercial goods	
Assessment methods: Constant evaluation of student's work. Final test in the end of semester. Duration and test date is given on the first class	
Recommended reading: G. Friedlob, Essentials Of Financial Analysis, WILEY 2003. L. Bernstein, J. Wild, Analysis Of Financial Statements, McGraw-Hill 2000. K. Palepu, Business Analysis And Valuation, SOUTH WESTERN 2004.	

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Course name: Introduction to e-business	
Course available with minimum number of 4 participants.	
Course code: EKL026	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Wielki Janusz, j.wielki@po.opole.pl	
Prerequisites: English (min B1 level), Information Technology	
Objectives of the course and learning outcomes: C1 – understanding the background of changes taking place in the contemporary economy and the role of information technology in these processes, C2 – understanding such terms as: e-economy, e-commerce, e-business, e-space, information society and relations between them, C3 – understanding the role of the Internet as a new business platform and its influence on changes in functioning of contemporary organizations, C4 – understanding the role of mobile technologies in the context of its impact on functioning of contemporary organizations and relations with the internet-based technologies, C5 – understanding the challenges faced by contemporary organizations in the context of electronic environment utilization.	
Teaching program: Overview of changes taking place in the contemporary economy and the emergence of the post-industrial economy. Development of information technology and its role in the changes taking place in the contemporary economy. Electronic economy development and the impact of the Internet in these processes. Phases of the Internet development. Virtualization of the business activities of business organizations and two dimensions of this phenomenon. Typology of the Internet utilization by contemporary enterprises. Business models used by business organization and the impact of the Internet on changes in this sphere. The development of the tools based on internet and mobile technologies and their impact on functioning of organizations. The impact of the Internet and mobile technologies on changes in value creation processes. Emergence of new challenges connected with utilization of the electronic environment by contemporary enterprises.	
Assessment methods: lecture: exam-test, individual consultations, laboratory: active participation in laboratory.	
Recommended reading: 1. Laudon J., Laudon K.: Management Information Systems with MyMISLab. Harlow: Pearson Education, 2012. 2. Bonnet A. et al.: Leading Digital. Boston: Harvard Business Review Press, 2014. 3. Brynjolfsson E., McAfee A.: The Second Machine Age. New York: W. W. Norton	

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Course name: Handel und Auslandsinvestitionen	
Course available with minimum number of 4 participants.	
Course code: EKL027	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: Deutsche	
Name of the lecturer and contact information: Bernat Maria, m.bernat@po.opole.pl	
Prerequisites: English (min B1 level), Voraussetzungen: Grundwissen der Mikro- und Makroökonomie	
Objectives of the course and learning outcomes: Ziele des Kurses: Das Verständnis von Internationalisierungsmechanismen und deren Einfluss auf die Wirtschaft.	
Teaching program: Lernprogramm: 1. Historische Entwicklung länderübergreifender Weltwirtschaftsaktivitäten. Ursachen und Folgen der Globalisierung 2. Weltwirtschaftsgeographie. Die Dimensionen und Entwicklungen der Einkommensungleichheit 3. Formen der Internationalen Unternehmungstätigkeit. 4. Theorie des Internationalen Handels (Theorie der absoluten Kostenvorteile, Theorie der komparativen Kostenvorteile b) Heckscher-Ohlin-Theorem c) Neofaktorproportionen -Theoren von Leontief 5. Determinanten und Struktur der Handels und Leistungsbilanz 6. Internationale Kapitalbewegungen Theorien der internationalen Direktinvestitionen. 7. Auslandsaktivitäten deutscher und polnischer Unternehmen 8. Einfluss der kulturellen Dimensionen auf den Internationalisierungsprozess 9. Management internationaler Unternehmungstätigkeit am Beispiel der ausgewählten Unternehmen 10. Internationale Integrationsabkommen a) Handelsabkommen b) Abkommen über Direktinvestitionen 11. Der Einfluß der Weltwirtschaftskrise 2008-2010 12. Stellung China in der Weltwirtschaft	
Assessment methods: Bewertungsmethoden: Analyse der Fallstudien, Test	
Recommended reading: Hofstede G. , Cultures and organizations, London, New York et al. 1991 Kania M., The Economic and Cultural Conditions and Consequences of Direct German Investments in Poland, Oficyna Wydawnicza Politechniki Opolskiej, Opole, 2009 Perlitz M., Internationales Management, G. Fischer Verlag, Stuttgart Jena, 1995 Schulte-Mattler H., Direktinvestitionen: Gründe für das Entstehen von multinationalen Unternehmen, Frankfurt am Main 1998 Welge M.K., Holtbrügge D., Internationales Management, Stuttgart, 2006 Weber M., Die protestantische Ethik und der Geist des Kapitalismus, Area Verlag GmbH, Erfstadt 2007	

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Course name: Managerial Accounting	
Course available with minimum number of 4 participants.	
Course code: EKL034	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Zygmunt Aleksandra, a.zygmunt@po.opole.pl Zygmunt Justyna, j.zygmunt@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of enterprise financial activity and microeconomics	
Objectives of the course and learning outcomes: Understanding and treatment of the conception and instruments of managerial accountancy in a field of management enterprises' costs	
Teaching program: The essence and the functions of managerial accountancy. The cost information significance in short and long-term decisions. Managerial accountancy of responsibility centres and its place in managerial information system. Balanced scorecard.	
Assessment methods: Constant evaluation of student's work. Final test at the end of semester. Duration and test date is given on the first class	
Recommended reading: a) Atkinson, R. Kaplan, S. Young, Management Accounting, PRENTICE HALL, 2004, 4th edition. b) M. Young, Reading Management Accounting, PRENTICE HALL, 2004, 3th edition. c) J. Zimmerman, Accounting for decision making and control, McGraw-Hill, 2003, 4th edition d) W. Allan, Fundamentals of Management Accounting, Elsevier 2008.	

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Course name: Techniques of negotiations and Mediations in Business	
Course available with minimum number of 4 participants.	
Course code: EKL040	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Klemens Brygida, b.klemens@po.opole.pl	
Prerequisites: English (min B1 level), -	
Objectives of the course and learning outcomes: Students learn: how to communicate in a good way, how to be assertive, how to listening, how to be a good negotiator	
Teaching program: What is negotiation? What kinds of negotiations do we have? How to be good negotiator? The importance of first impression; Negotiation strategies; Negotiations process; The role of time; Art and the importance of mediation in business; Negotiation techniques: difficult partner, part-power of attorney, illusory concession, delay technique, shocking offer, false shock, wolf in sheep's skin, Stress and techniques of it's elimination; Relaxation methods	
Assessment methods: - group work and discussions with students, - audiovisual techniques, - case studies, - problem solving.	
Recommended reading: R. Fisher, B. Patton, W. Ury, Getting to yes: Negotiating Agreement without Giving in, New York 1991; G. Kennedy, Essential Negotiation. An A-Z Guide, The Economist Newspaper, U.K. 2009; A. Lempereur, Negotiation, Business School, 2010; H. Raiffa, The Art and Science of Negotiation, Harvard College 2003; P. Steel, T. Beasor, Business Negotiation, Gower Publishing Limited, Burlington 1999; W. Ury, Getting past no: negotiating your way from confrontation to cooperation, New York 1993.	

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Course name: Methodology of Market Research	
Course available with minimum number of 4 participants.	
Course code: EKL042	Form of class: Lecture, Group tutorial, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Szewczyk Mirosława, m.szewczyk@po.opole.pl	
Prerequisites: English (min B1 level), none	
Objectives of the course and learning outcomes: Student is to know the methods and techniques of developing and realize its own market research. Student is to know the process of market research formulation, realization and completion.	
Teaching program: Market research design; Desk research; Primary research and methods; Sampling; Questionnaire design; Data gathering; Data analysis and presentation	
Assessment methods: Case study	
Recommended reading: P. Hague, N. Hague, Marketing Research in Practice. A guide to the Basics, Kogan Page Ltd., 2004	

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Course name: Macroeconomics	
Course available with minimum number of 4 participants.	
Course code: EKM002	Form of class: Lecture, Seminar,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Rokita-Poskart Diana, d.rokita@po.opole.pl	
Prerequisites: English (min B1 level), Basic economic knowledge	
Objectives of the course and learning outcomes: The main objective of the course is to provide the students opportunity to gain or enhance basic macroeconomic knowledge	
Teaching program: -Introduction to macroeconomics -System of National Accounts -National income and price determination -Consumption and Saving -Money market -Inflation -Monetary and fiscal policy -Economic growth and development -Macroeconomic shocks and fluctuation	
Assessment methods: Case studies and an end-of-course test	
Recommended reading: David Begg, Stanley Fischer, Rudiger Dornbusch, Economics, London 2005. David Andolfatto, Macroeconomic Theory and Policy Preliminary Draft - http://www.sfu.ca/~dandolfa/macro2005.pdf Milton Freedman, Capitalism and Freedom, University of Chicago Press, 2002. N. Gregory Mankiw, Macroeconomics, Harvard University 2012.	

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Course name: Makroökonómie	
Course code: EKM002/DE	Form of class: Lecture, Group tutorial,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: Deutsch	
Name of the lecturer and contact information: Bernat Maria, m.bernat@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Student beherrscht die Terminologie in der Wirtschaft verwendet, versteht seine Quellen und Anwendungen im Rahmen der entsprechenden Disziplinen an der Oberstufe Student hat eine erweiterte Kenntnisse über die Mechanismen der sozialen, wirtschaftlichen Regeln Student kann in vertiefte theoretische Wissen nutzen, sowie die Erfassung der Daten notwendig, zu analysieren und zu interpretieren, Prozesse und Phänomene in der Ökonomie und verwandten Disziplinen	
Teaching program: Das Bruttoinlandsprodukt (Einkommen, Produktion Und wirtschaftlicher Kreislauf) Geld und Inflation Zentralbankpolitik, Geldmenge steuerung Staatsverschuldung Und Budgetdefizit Die offene Volkswirtschaft (Kapital und Güterströme) IS-LM Modell Das Gesamtnachfrage Und Gesam angebots-Modell Das Mundell-Fleming Modell Zwischen Inflation Und Arbeitslosigkeit Theorie gesamtwirtschaftlicher Schwankungen Makroökonomische Wirtschaftspolitik	
Assessment methods: Vorträge, Analyse der Fallstudie , schriftliche Prüfung	
Recommended reading: N.G. Mankiw, Makroökonomik mit vielen Fallstudien, Stuttgart 2000 W. A. Koch, Ch. Czogalla, Grundlagen der Wirtschaftspolitik, Stuttgart 2004 Samuelson, P.A., Nordhaus, W.D., Volkswirtschaftslehre, Bd. 1 und 2, Köln 2002 und 2005	

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Course name: Statistical Inference	
Course available with minimum number of 4 participants.	
Course code: EKM003	Form of class: Lecture, Group tutorial,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 7	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Szewczyk Mirosława, m.szewczyk@po.opole.pl	
Prerequisites: English (min B1 level), This course is intended for students who have a limited background in mathematics.	
Objectives of the course and learning outcomes: The course covers the basic statistical methods for understanding, modelling and interpreting data together with an introduction to the concepts of statistical theory. Emphasis is placed on applications in business. Students will be expected to analyse data, design and implement solutions to various problems.	
Teaching program: 1.Probability 2.Discrete and continuous random variables. Distributions covered: Binomial, Poisson, Normal. The Chi-square distribution. T-Student distribution. Relationship between probability and the area under a probability curve. The normal distribution and the associated statistics and probabilities. 3.Populations. Samples from populations. 4.Estimation of parameters, confidence intervals and 5.Hypothesis tests. One-sample and two-sample tests. Chi-square tests of independence, homogeneity. Contingency tables.	
Assessment methods: Practical assignments and final exam.	
Recommended reading: E. Mansfield; Statistics for Business and Economic: Methods and Applications; W.W. Norton	

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Course name: Econometric modelling and forecasting	
Course available with minimum number of 4 participants.	
Course code: EKM004	Form of class: Lecture, Laboratory,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 7	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Mach Łukasz, l.mach@po.opole.pl Szewczyk Mirosława, m.szewczyk@po.opole.pl	
Prerequisites: English (min B1 level), Econometric, Statistics.	
Objectives of the course and learning outcomes: The aim of the subject is to give students the ability to prepare forecasts and simulations regarding micro- and macroeconomics affairs	
Teaching program: LECTURES: General Introduction, Identifying Patterns in Time Series Data (Trend Analysis, Analysis of Seasonalit), Exponential Smoothing (Brown and Holt models), Seasonal Decomposition (Winters model ARIMA Methodology,), quantity forecast models (logit, probit, discriminations analysis use in economic and mamagenet phenomens). LABORATORY: General Introduction, Identifying Patterns in Time Series Data (Trend Analysis, Analysis of Seasonalit), Exponential Smoothing (Brown and Holt models), Seasonal Decomposition (Winters model ARIMA Methodology,), quantity forecast models (logit, probit, discriminations analysis use in economic and mamagenet phenomens).	
Assessment methods: Presentations, work in Statistica 9.0 from Statsoft and Gretl. Project and exam	
Recommended reading: Maria Cieślak – Prognozowanie gospodarcze Józef Biolik, Andrzej Stanisław Barczak – Podstawy ekonometrii Aleksander Zeliaś – Teoria prognozy Maddala G.S. Ekonometria Dziechciarz Józef – Ekonometria. Metody, Przykłady, Zadania Radzikowska Barbara – Metody prognozowania Gruszczyński Marek – Ekonometria i badania operacyjne Dittmann Paweł – Prognozowanie w przedsiębiorstwie	

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Course name: Concepts of Management	
Course available with minimum number of 4 participants.	
Course code: EKM016	Form of class: Lecture, Group tutorial,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 7	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Karaś Elżbieta, e.karas@po.opole.pl	
Prerequisites: English (min B1 level), Knowledge of basic enterprise management	
Objectives of the course and learning outcomes: Preparing students to find ways of solving problems in area of management and to use basic new methods and techniques.	
Teaching program: Introduction - theoretic basis of quality management Total Quality Management Business Process Reengineering Knowledge Organization Just in Time System Learning Organization Kaizen Management System Lean Management Benchmarking Organization of the Network Virtual enterprise - an example of business A human aspect of the new methods of management	
Assessment methods: Lecture and multimedia presentations, group discussions, case studies, preparing papers.	
Recommended reading: Imai M.: Kaizen. The Key to Japan's Competitive Success, New York 2007 Hoyle D.: ISO 9000 Quality Systems Handbook, Oxford 2003 Liker J. K.: Toyota Way, New York 2003 Oakland J.: Quality Management, Oxford 2004 Senge Peter M.: The Fifth Discipline: The Art	

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Course name: Controlling in the Management	
Course available with minimum number of 4 participants.	
Course code: EKM017	Form of class: Lecture, Seminar,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Zygmunt Aleksandra, a.zygmunt@po.opole.pl Zygmunt Justyna, j.zygmunt@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of enterprise financial activity and microeconomics	
Objectives of the course and learning outcomes: Understanding and usage of methods and techniques of controlling in company management.	
Teaching program: The issue and genesis of controlling. Functions of controlling in company management. The criteria of controlling division. The methods of strategic controlling (Balanced Scorecard, benchmarking, early warning systems, responsibility centres). The methods of operational controlling (budgeting, costs analysis).	
Assessment methods: Constant evaluation of student's work. Final test in the end of semester. Duration and test date is given on the first class	
Recommended reading: a) Ch.S. Chapman, Controlling strategy: management, accounting, and performance measurement, Oxford University Press, 2005. b) R.S. Kaplan, D.P. Norton, The Balanced Scorecard: Translating Strategy into Action, 1996. c) R.S. Kaplan, D.P. Norton, The Strategy-Focused Organization: How Balanced Scorecard Companies Thrive in the New Business Environment, 2000.	

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Course name: Kontrolling v upravlении	
Course available with minimum number of 4 participants.	
Course code: EKM017/R	Form of class: Lecture, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: Russian	
Name of the lecturer and contact information: Sytnik Inessa, i.sytnik@po.opole.pl	
Prerequisites: English (min B1 level), Imet bazovye znaniya osnov teorii i metodologii v ramkah svyazannykh naychnykh disciplin mikroekonomika, makroekonomika, finansi, menedjment.	
Objectives of the course and learning outcomes: Formirovanie sistemi bazovykh znaniy po teorii i praktike primeneniya kontrollinga v deyatel'nosti predpriyatiy.	
Teaching program: 1. Ponyatie i syshnost kontrollinga v upravlenii kompanii. 2. Kontrolling kak instrymet upravleniya predpriyatiem. 3. Instrymenti strategicheskogo kontrollinga. 4. Instrymenti operacionnogo kontrollinga. 5. Kontrolling personala. 6. Kontrolling v logistike. 7. Kontrolling v marketingovoi deyatel'nosti. 8. Kontrolling na yrovne proektov. 9. Kontrolling proizvodstvennoi deyatel'nosti predpriyatiya.	
Assessment methods: Polozhitelnaya ocenka testa (polychenie ne menee 50% ballov), zachet prakticheskikh zanyatii.	
Recommended reading: [1] Byresh O., Gerbeeva L., Chigrova N., Soldatova L. Biznes-kontrolling: ychebnoe posobie: - OGY, 2013. - 146 s. [2] Levkin G. G., Kyrshakova N. B. Kontrolling i upravlenie logisticheskimi riskami: ychebnoe posobie: - Direkt-Media, 2015 - 142 s [3] Rogojin M. U., Organizaciya upravleniya personalom predpriyatiya: ychebno-prakticheskoe posobie: - Direkt-Media, 2014. - 223 s. [4] Teplyakova T. U. Kontrolling: Ychebnoe posobie: Ylyanovsk: YIGTY, 2010.	

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Course name: Company pricing and value shaping	
Course available with minimum number of 4 participants.	
Course code: EKM018	Form of class: Lecture, Group tutorial,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Zygmunt Justyna, j.zygmunt@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of enterprise financial activity and economy	
Objectives of the course and learning outcomes: Understanding the aspects of value-based management. Recognition of methods and measures applied in company value pricing processes.	
Teaching program: The essence and the premises of company value pricing. Value standards. Functions of company value pricing. Factors affecting company value. System and stages of value-based management. Classification of company value pricing methods. Factors of value pricing methods selection. Income methods. Assets based methods. Mixed and comparative methods. Internal and external measures of value creation efficiency. Strategic matrixes of value-based management. Intellectual capital in value-based management.	
Assessment methods: Constant evaluation of student's work. Final test in the end of semester. Duration and test date is given on the first class	
Recommended reading: [1] R.A. Brealey, S.C. Myers, Capital Investment and Valuation, The McGraw Hill, New York 2003. [2] A. Rappaport, Creating Shareholder Value, Free Press, 1997. [3] A. Brooking, Intellectual Capital: Core Assets for the Third Millennium Enterprise, Thomson Business Press, London 1996. [4] A. Damodaran, Damodaran on Valuation. Security Analysis for Investment and Corporate Finance, John Wiley	

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Course name: Quality Policy	
Course available with minimum number of 4 participants.	
Course code: EKM020	Form of class: Lecture, Group tutorial,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Karaś Elżbieta, e.karas@po.opole.pl	
Prerequisites: English (min B1 level), Knowledge of basic enterprise management	
Objectives of the course and learning outcomes: Preparing students to find ways of solving problems in area of quality management and to use basic methods and techniques.	
Teaching program: Fundamental issues of quality management Method of self-assessment by quality criteria Method of process mapping Just-in-time system Ishikawa's and Pareto's diagrams Kaizen Management System Creating documentation according to ISO 9000 standards Guidelines for benchmarking in enterprise	
Assessment methods: Lecture and multimedia presentations, group discussions, case studies, preparing papers	
Recommended reading: Imai M.: Kaizen. The Key to Japan's Competitive Success, New York 2007 Hoyle D.: ISO 9000 Quality Systems Handbook, Oxford 2003 Liker J. K.: Toyota Way, New York 2003 Oakland J.: Quality Management, Oxford 2004	

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Course name: Managing of image and brand	
Course available with minimum number of 4 participants.	
Course code: EKM021	Form of class: Lecture, Group tutorial,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Jasińska-Biliczak Anna, a.jasinska-biliczak@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: This course provides insights and experience in strategic brand management. Course objectives are to: Provide an understanding of the key issues in building and maintaining brands and brand equity. Learn and apply key elements of crafting and driving brand strategy, evaluating strategic options, and exposure to Marketing's role and accountabilities in brand and strategy decision-making. Provide exposure to and project participation in brand positioning, strategic brand management brand portfolio strategies, and brand planning.	
Teaching program: Brand equity in question, Strategic implications of branding, Brand and business building, From private labels to store brands, Brand diversity: the types of brands, The challenges of modern markets: The new rules of brand management, Brand identity and positioning, : Creating and sustaining brand equity: Launching the brand, The challenge of growth in mature markets, Sustaining a brand long term, Adapting to the market: identity and change, Growth through brand extensions, Handling name changes and brand transfers, Managing global brands, Financial valuation and accounting for brands	
Assessment methods: Written exam	
Recommended reading: Kapferer, Jean-Noël, New strategic brand management : creating and sustaining brand equity long term	

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Course name: Social Economics	
Course available with minimum number of 4 participants.	
Course code: EKM030	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 7	Start date: October, February
Number of hours per week: 3	Number of hours per semester: 45
Language of instruction: English	
Name of the lecturer and contact information: Jasińska-Biliczak Anna, a.jasinska-biliczak@po.opole.pl Kubiciel-Lodzińska Sabina, s.kubiciel@po.opole.pl Tereszkiewicz Filip, f.tereszkiewicz@po.opole.pl	
Prerequisites: English (min B1 level), Knowledge of basic economy aspects	
Objectives of the course and learning outcomes: Students learn about the aims of social economy and it's role in the economic development	
Teaching program: The concept of social economy, basic definitions, goals Development of social economy in the world and in Europe over the years The share of local governments in the creation of social economy Participation of NGOs in the social economy The social economy as a tool to combat social exclusion Labour market Measuring the standard of living The concept and principles of social co-operation Human resource management in the social economy entities Good practices - examples of effective implementation of the principles of social economy	
Assessment methods: On the basis of participation in discussion. Final test in the end of semester. The date is given on the first class.	
Recommended reading: C. Tremblay, Advancing the Social Economy for Socio-economic Development: International perspectives, Public Policy Paper Series, Number 01 - September 2009. J. Curl, For All The People: Uncovering the Hidden History of Cooperation, Cooperative Movements, and Communalism in America, PM Press, 2009	

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Course name: Social research methods	
Course available with minimum number of 4 participants.	
Course code: EKM032	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Maj Jolanta, j.maj@po.opole.pl	
Prerequisites: English (min B1 level), -	
Objectives of the course and learning outcomes: By the end of the course, and having completed the essential reading and activities the student will be able to: formulate researchable questions, define a research strategy and design a research project to answer a research question, discuss the practice and principles of qualitative and quantitative social research	
Teaching program: -Approaches to Research, Research ethics and Research -Research Methodology -Data collection: Sampling, Case Study Method, Survey Method, Experimental Method, Available Data, Observation, Interviews, Questionnaires, Tests -Data analysis: Measurement Principles, Qualitative Data, Quantitative Data -Action: The Report, Using the Results	
Assessment methods: Graded research project, written exam	
Recommended reading: J. Adams, Research Methods for Graduate Business and Social Science Students, 2007. G. Guthrie, Basic Research Methods : An Entry to Social Science Research, 2010. T. Gschwend, F. Schimmelfennig, Research Design in political Science. How to practice what they preach, Palgrave Macmillan, 2011. K. Singh, Quantitative Social Research Methods, 2007. N. Walliman, Social Research Methods, 2006. K. Yang, Making Sense of Statistical Methods in Social Research, 2010.	

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Course name: Programming of local and regional development policy	
Course available with minimum number of 4 participants.	
Course code: EKM043	Form of class: Lecture, Seminar,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Jasińska-Biliczak Anna, a.jasinska-biliczak@po.opole.pl	
Prerequisites: English (min B1 level), Knowledge of principles of regional and local development	
Objectives of the course and learning outcomes: Students learn the theory of regional development as well as how to use the knowledge about regional structures in practice at example of Polish and European institutions.	
Teaching program: Introduction. Theory of local and regional development. Factors and barriers of regions' as well as local units development. Financial factors and barriers. HR in regional development. Factors and barriers – meaning for regional enterprise. Information as the development factor.	
Assessment methods: -credit based on students participation in classes, -practical tasks, -activity.	
Recommended reading: Hirschman A.O., The Strategy of Economic Development, New Haven, London, 1958, Malizia E.E., Feser E.J., Understanding Local Economic Development, Rutgers, Center for Urban Policy Research, New York, 1999, Myrdal G., Economic Theory and Undeveloped Regions, Methuen	

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Course name: Strategic Management	
Course available with minimum number of 4 participants.	
Course code: EKM044	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 7	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Dymek Łukasz, l.dymek@po.opole.pl	
Prerequisites: English (min B1 level), The aim of the course is to provides an intellectually rich, yet thoroughly practical, analysis of strategic management concepts today and to give students a complete understanding of how today's businesses use strategic management to establish sustained competitive advantage	
Objectives of the course and learning outcomes: 1.Introduction to strategy management 2. Strategic Management and Strategic Competetivness 3. Strategy Formulation 4. Startegy Implementation 5. Corporate Governanve 6. Sustainability Development 7. Strategic Leadership	
Teaching program: Participation in discussion and case study preparation and analysis	
Assessment methods: Participation in discussion and case study preparation and analysis	
Recommended reading: Hitt M.A., Ireland R.D., Hoskisson R.E., Strategic Management: Concepts: Competitiveness and Globalization, South-Western College Pub, 2010. Dess G., Lumpkin A.T., Eisner A., Strategic Management: Creating Competitive Advantages, Mc Graw-Hill, 2009. David F.R., Strategic Management: Concept, Prentice Hall, 2010. Hitt M.A., Hoskisson R.E., R.D. Ireland, Strategic Management: Cases Competitiveness and Globalization, South-Western College Pub, 2010.	

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Course name: Conflicts resolution	
Course available with minimum number of 4 participants.	
Course code: MASGL038	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Klemens Brygida, b.klemens@po.opole.pl	
Prerequisites: English (min B1 level), -	
Objectives of the course and learning outcomes: Students learn: how response to a conflict situation, how managing conflict situations, how be better in conflict resolution, how to relax in conflict situation.	
Teaching program: Levels of conflicts; Defining conflict: where do you stand? Response to conflict: fight or flight? Examples of conflicts (moral, religious, family, intergroup, organizational) Know yourself; Cooperation – competition; Managing conflict in small and in large groups; Why trust is critical into relationships? Managing trust and distrust in conflict situations; Training in conflict resolution; Relaxation methods.	
Assessment methods: - group work and discussions with students, - audiovisual techniques, - case studies, - problem solving.	
Recommended reading: M. Deutsch, P.T. Coleman, E.C. Marcus, The Handbook of Conflict Resolution. Theory and Practice, Jossey-Bass, San Francisco 2006; J. Lambert, S. Myers, 50 Activities for Conflict Resolution. Group Learning and Self Development Exercises, Human Resource Development Press, Massachusetts 1999.	

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Course name: Communication in team leading	
Course available with minimum number of 4 participants.	
Course code: MSGL035	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Karczewski Leszek, l.karczewski@po.opole.pl	
Prerequisites: English (min B1 level), -	
Objectives of the course and learning outcomes: Students learn: how to communicate in a good way, how to be assertive, how to listening, how to speak, how to speak in public.	
Teaching program: What is communication? Communication act elements like: sender, addressee, announcement, channel, noise, feedback, effect; Verbal and nonverbal communication; The role of communication; Tasks requirement; Good communication principles; Good communication techniques; Public speech; Accept criticism and commendation; Assertiveness techniques like: announcement "I"; 4 step-technique; border building technique; fog curtains technique	
Assessment methods: - group work and discussions with students, - audiovisual techniques, - case studies, - problem solving.	
Recommended reading: Joep Cornelissen, Corporate Communication. A Guide to Theory and Practise, SAGE Publications, Singapore 2011; Mary Ellen Guffey, Dana Loewy, Business Communication. Process and Product, South-Western, Mason 2011; Julia T. Wood, Interpersonal Communication Everyday Encounters, Wadsworth, Boston 2013.	

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Course name: коммуникация в управлении группой	
Course available with minimum number of 4 participants.	
Course code: MSGL035/R	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: Russian	
Name of the lecturer and contact information: Kalczyńska Maria, m.kalczyńska@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: ОЗНАКОМЛЕНИЕ СТУДЕНТОВ С ОСНОВНЫМИ ПРОБЛЕМАМИ В ОТНОШЕНИИ ПРЕДМЕТА КОММУНИКАЦИИ В ГРУППЕ.	
Teaching program: Основные понятия: допущения к предмету Трансформация цивилизации в коммуникации Невербальные сообщения в группе Невербальные сообщения в группе Вербальная коммуникация Вербальная коммуникация Применение принципов руководства в коммуникации Эффективное управление конфликтом в группе Публичные выступления в группах Методы влияния в группе Роль управления временем в группе Мотивирование и оценка связи коммуникации Методы самосовершенствования общения коммуникации Организационная культура в коммуникационной группе Резюме темы	
Assessment methods: Методист: лекция, мультимедиа презентация Форма и критерии вопроса: окончательный устные или письменные	
Recommended reading: 1. Adams K., Galanes G. J., Komunikacja w grupach, Warszawa 2008 2. Goban-Klas T., Media i komunikowanie masowe, warszawa 1999 3. Griffin E., Podstawy komunikacji społecznej, Gdańsk 2003 4. Griffin R. W., Podstawy zarządzania organizacjami, Warszawa 1999 5. Morreale S. P., Komunikacja między ludźmi, Warszawa 2007 6. Nęcki Z., Komunikacja międzyludzka, Kraków 1996 7. Ober J., Funkcja i rola efektywnej komunikacji w zarządzaniu, Zeszyty naukowe politechniki śląskiej 2013 seria: organizacja i zarządzanie z. 65 nr kol. 1897 – 8. Rebel G., Mowa ciała, Wrocław brw. 9. Scott W. E., Zachowanie człowieka w organizacji, Warszawa 1983 10. Sztuka skutecznego porozumiewania się, pod red. M. McKay, Gdańsk 2006 11. Batko A., Sztuka perswazji, czyli język wpływu i manipulacji, Gliwice, 2001 12. Belbin M., Twoja rola w zespole, 2003 13. Kożusznik B., Zachowania człowieka w organizacji, 2007 14. Cialdini R., Wywieranie wpływu na ludzi. Teoria i praktyka, Gdańsk, 1999	

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Course name: Organizational Behavior	
Course available with minimum number of 4 participants.	
Course code: MSGL040	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Maj Jolanta, j.maj@po.opole.pl	
Prerequisites: English (min B1 level), -	
Objectives of the course and learning outcomes: Understanding essence and the mechanism of organization behavior, their conditions and influence on organization and management	
Teaching program: Essence, internal and external conditions of organizational behaviors, authority and leadership at organization, conflict: interpersonal, internal and between groups, communication in organization, stress: reason, symptoms and methods to overcome the stress	
Assessment methods: On the basis of participation in discussions	
Recommended reading: S.R. Robbins, T.A. Judge, Organizational Behavior J.R., Jr Schermerhorn, J.G.Hunt, R.N. Osborn, Organizational Behavior M.A. Hitt, C.Ch. Miller, A. Colella, Organizational Behavior: A Strategic Approach	

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Course name: Organizational Culture	
Course available with minimum number of 4 participants.	
Course code: MSGL043	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Maj Jolanta, j.maj@po.opole.pl Mazur-Kajta Katarzyna,	
Prerequisites: English (min B1 level), Basics of Management; knowledge about organization, structure of organization	
Objectives of the course and learning outcomes: Understanding essence of the organizational culture, understanding differences between national cultures. Main goal is for the students to be able to describe cultural differences and their influence on the Organizations in different countries.	
Teaching program: LECTURES: Organizational culture, definition, types and profiles of culture, national cultures and organizational cultures, culture shock , leadership in organization and national culture, the seven cultures of capitalism, changing of culture. CLASSES: - Definition of Organizational Culture - Culture Typologies: Deal	
Assessment methods: On the basis of participation in discussions. Test and grade from working in groups	
Recommended reading: J.Martin, Cultures in Organizations: Three Perspectives E.H. Schein, Organizational Culture and Leadership Ch.M. Hampden- Turner, F.Trompenaars, Building Cross-Cultural Competence: How to Create Wealth from Conflicting Values Kim S. Cameron Robert E. Quinn. - Organizational Culture Ch. M. Hampden-Turner	

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Course name: Fundamentals of Management	
Course available with minimum number of 4 participants.	
Course code: ZL008	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 8	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Dymek Łukasz, l.dymek@po.opole.pl	
Prerequisites: English (min B1 level), -	
Objectives of the course and learning outcomes: The aim of the course is to develop and strengthen today's most important management skills and to understand the management principles, organizational behavior, as well as basic financial statement, controlling and human resources management. It gives the introduction into all areas of management.	
Teaching program: 1. Management and Entrepreneurship 2. The Global Environment: Culture, Social Responsibility and Sustainability 3. Planning: Problem Solving and Decision Making, Strategic and Operating Plan 4. Organizing work: job design, authority and delegating work 5. Change Management 6. Human Resources Management 7. Organizational Behaviour 8. Basic of Financial Management and Controlling	
Assessment methods: On the basics of participation in discussion. Constant evaluation of student' s work.	
Recommended reading: Robbins S.P., De Cenzo D., Coulter M., Fundamentals of management, Prentice Hall, 2012. Griffin R.W., Fundamentals of management, South-Western College Pub, 2011. Lussier R. N., Management Fundamentals: Concepts, Applications, Skill Development	

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Course name: Science of Organization	
Course available with minimum number of 4 participants.	
Course code: ZL009	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 7	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Dymek Łukasz, l.dymek@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of specific legal terminology	
Objectives of the course and learning outcomes: Student is required to know what an organization is, what are basic theories on organization in the science. This knowledge is essential in further building organizational structures. Familiarization to the changes in organization, corporate social responsibility is necessary to efficient organization management.	
Teaching program: Theory of organization. Basic trends in theory of organization. Definition, types and features of organization. Organization models. Organization environment. Organization life cycle. Corporate social responsibility. Resources in organization. Building organizational structures. Principles of organization management. Changes in organization. Cooperation within organization.	
Assessment methods: Discussion, practice work, test, case study.	
Recommended reading: B. Kozuch, Science of Organization, Cedewu.	

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Course name: Mathematics in Economics and Management	
Course available with minimum number of 4 participants.	
Course code: ZL014	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 7	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Szewczyk Mirosława, m.szewczyk@po.opole.pl	
Prerequisites: English (min B1 level), This course is intended for students who have a limited background in mathematics.	
Objectives of the course and learning outcomes: This course introduces students to the mathematical language, skills and techniques necessary for success in many of today's fields. Emphasis is placed on applications in business. Developing skills of view expression on the basis of mathematical conceptions, symbols and terms.	
Teaching program: 1. Review of fundamental 2. Matrices. Operations on matrices. Determinants and matrix inversion. 2. Systems of linear equations. Systems of linear inequalities. 3. Relations and functions. 4. Sequences, series and limits. 5. Differentiation (function of one variable). 7. Optimization 8. Differentiation (function of more than one variable) 9. Integration. 10. Differential equation. Applications to economics and management	
Assessment methods: Practical assignments. Final exam.	
Recommended reading: M. Timbrell, Mathematics for economists: an introduction, Blackwell, Oxford 1990. M. Rosser, Basic Mathematics for Economists, Routledge, London 2003. V. C. Mavron, T. N. Phillips, Elements of Mathematics for Economics and Finance Springer-Verlag, London 2007.	

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Course name: Descriptive Statistics	
Course available with minimum number of 4 participants.	
Course code: ZL015	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Szewczyk Mirosława, m.szewczyk@po.opole.pl	
Prerequisites: English (min B1 level), This course is intended for students who have a limited background in mathematics.	
Objectives of the course and learning outcomes: This course introduces students to the statistical language, skills and techniques necessary for success in many of today's fields. Emphasis is placed on applications in business. Developing skills of view expression on the basis of symbols and terms. Students will be expected to analyse data, design and implement solutions to various problems.	
Teaching program: 1. Introduction to Statistics 2. Descriptive statistics. Measures of central tendency, measures of dispersion, measures of asymmetry. Empirical distributions and its graphics illustrations. Box-and-whisker plot. Measures of two aspects of the "shape" of the distributions: skewness and kurtosis. 3. Regression and correlation analysis. Correlation coefficients: Pearson correlation and Spearman's rho. Scatterplot. Simple linear regression. Method of least squares. 4. Time Series and Index Numbers. Linear trend.	
Assessment methods: Practical assignments and final exam.	
Recommended reading: E. Mansfield; Statistics for Business and Economic: Methods and Applications; W.W. Norton	

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Course name: Human Resources Management	
Course available with minimum number of 4 participants.	
Course code: ZL018	Form of class: Lecture, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Maj Jolanta, j.maj@po.opole.pl Mazur-Kajta Katarzyna, Polek-Duraj Kornelia, k.polek-duraj@po.opole.pl	
Prerequisites: English (min B1 level), -	
Objectives of the course and learning outcomes: The acquisition of basic knowledge in the field of human resource management, identification of possible HRM issues, development of skills in creating and managing team.	
Teaching program: During the course the following topics will be discussed: - Stages of development in human resources - Management models for human resources - Employee recruitment and selection - Employee integration - Employee motivation - Education and Training - Social interactions and their roles - Importance of interpersonal communication in a team	
Assessment methods: - actively participate in the discussion - the last test / the term paper are passed positively	
Recommended reading: - Armstrong`s Handbook of Human Resource Management Practice, Armstrong M., Taylor S., Kogan Page, 2014. - Human resource management in transition, edited by Poczowski A., Wolters Kluwer, 2011.	

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Course name: Personalwirtschaft	
Course available with minimum number of 4 participants.	
Course code: ZL018/DE	Form of class: Lecture, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: Deutsch	
Name of the lecturer and contact information: Mazur-Kajta Katarzyna,	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: Es werden Grundkenntnisse zu Themen des Human Resource Managements erworben sowie zur Ausrichtung der aktuellen HRM Fragen und dem Erwerb von Kompetenzen bei der Schaffung und Leitung eines Teams.	
Teaching program: Während des Kurses werden nachstehende Themen besprochen: - Phasen der Entwicklung bei Human Ressourcen - Management-Modelle für das Personalwesen - Mitarbeiterrekrutierung und -auswahl - Mitarbeiterintegration - Mitarbeitermotivation - Aus-und Weiterbildung - Coaching - Soziale Interaktionen und ihre Rollen - Bedeutung der zwischenmenschlichen Kommunikation im Team	
Assessment methods: Um die ECTS Punkte zu erhalten muss man: - während 87% der Lektionen anwesend sein - aktiv an der Diskussion teilnehmen - den letzten Test/die Seminararbeit positiv bestehen	
Recommended reading: Deutsche Literatur (grundlegende): - Jung H., Personalwirtschaft, Oldenbourg Verlag München, Oldenbourg 2009. - Olfert K., Lexikon Personalwirtschaft, Kiehl, Herne 2008. - Becker M., Personalwirtschaft – Lehrbuch für Studium und Praxis, Schäffer-Poeschel Verlag, 2010. - Hohlbaum A., Olesch G., Human Resources - Modernes Personalwesen, Merkur Verlag, August 2010. - Weeraratne M., Personalmanagement. Personalentwicklung als Instrument zur Steigerung des Human Capital Wertes, VDM Verlag, August 2010. - Buehner R., Personalmanagement, Oldenbourg Wissenschaftliche Verlag, November 2004. - Oechsler W. A., Personal und Arbeit. Grundlagen des Human Resource Management und der Arbeitgeber-Arbeitnehmer-Beziehungen, Oldenbourg Wissenschaftliche Verlag, Januar 2006. Polnische Literatur (zusätzliche): - Armstrong M., Zarządzanie zasobami ludzkimi, ABC, Kraków 2003. - Griffin R.W., Podstawy zarządzania organizacjami, Wydawnictwo Naukowe PWN,	

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Course name: Quality Management	
Course available with minimum number of 4 participants.	
Course code: ZL019	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Karaś Elżbieta, e.karas@po.opole.pl	
Prerequisites: English (min B1 level), Knowledge of basic enterprise management	
Objectives of the course and learning outcomes: Preparing students to find ways of solving problems in area of quality management and to use basic methods and techniques.	
Teaching program: Introduction – theoretic basis of quality management Quality management methods used in enterprises Tools of quality improvement Quality management and standardization according to ISO series 9000 Standardization documentation Auditing and certification of quality management systems Practical implementation of quality management system Concept of quality costs A human aspect of quality management	
Assessment methods: Lecture and multimedia presentations, group discussions, case studies, preparing papers	
Recommended reading: Imai M.: Kaizen. The Key to Japan's Competitive Success, New York 2007 Hoyle D.: ISO 9000 Quality Systems Handbook, Oxford 2003 Liker J. K.: Toyota Way, New York 2003 Oakland J.: Quality Management, Oxford 2004	

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Course name: Information technology in management	
Course available with minimum number of 4 participants.	
Course code: ZL020	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Wielki Janusz, j.wielki@po.opole.pl	
Prerequisites: English (min B1 level), Basics of management	
Objectives of the course and learning outcomes: C1 - understanding the notion of information system and its role in the functioning of business organizations, C2 - understanding the role information technology as important element of information systems, C3 - understanding the components of information technology, C4 - understanding the impact of information technology on changes taking place in the functioning of business organizations, C5 - understanding the challenges connected with information technology.	
Teaching program: Information systems and their role in the functioning of business organizations. Information technology as an important element of IS. The new role of information systems and information technology in organizations. Hardware infrastructure and system software infrastructure. Network infrastructure and the Internet. Internet technology-based tools and solutions. Security, ethical and social challenges connected with information technology utilization in organizations	
Assessment methods: lecture: exam-test, individual consultations, laboratory: active participation in laboratory.	
Recommended reading: 1.Laudon J., Laudon K.: Management Information Systems with MyMISLab. Har-low: Pearson Education, 2012. 2.Laudon J., Laudon K.: Management Information Systems. Upper Saddle River: Prentice-Hall, 2002.	

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Course name: Basics of Marketing	
Course available with minimum number of 4 participants.	
Course code: ZL021	Form of class: Lecture, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Adamska Małgorzata, m.adamska@po.opole.pl	
Prerequisites: English (min B1 level), Basics of management requirements: basic knowledge about organization; structure, functions and environment of organization	
Objectives of the course and learning outcomes: The most important goal of the subject is for students to understand the importance of a Marketing in the organization, its general concept and presence in life. Has the ability to recognize and implement the instruments of marketing within the enterprise; has the ability to think and act in rational and entrepreneurial way; has the ability to realize team and individual marketing tasks	
Teaching program: - Basic concepts of marketing - Marketing environment - Consumers and their behavior on the Market - Market segmentation - Product - Price - Promotion - Advertisement, Public relations - Distribution - Marketing Information System	
Assessment methods: one-choice test, activity during the lesson	
Recommended reading: Gary Armstrong, Michael Harker, Philip Kotler, Ross Brennan: Marketing: An Introduction Jerzy Altkorn, Basics of Marketing	

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Course name: Marketing Research	
Course available with minimum number of 4 participants.	
Course code: ZL022	Form of class: Lecture, Laboratory,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 8	Start date: October, February
Number of hours per week: 4	Number of hours per semester: 60
Language of instruction: English	
Name of the lecturer and contact information: Szewczyk Mirosława, m.szewczyk@po.opole.pl	
Prerequisites: English (min B1 level), Marketing Basic	
Objectives of the course and learning outcomes: The course aims to study the process of marketing research. Students Student has to gain the knowledge about the problem definition, exploratory and descriptive research, data collection methods, designing the sample, data analysis and interpretation.	
Teaching program: Role of Marketing Research. Research Process. Problem Formulation. Research Design. Sampling and Nonsampling Errors. Measurement In Marketing Research. Primary and Secondary Data Collection. Sampling Procedure. Questionnaire Design. Data Analysis. Data Interpretation. The Research Report	
Assessment methods: Tasks, practice tests, discussion, individual and group projects. Case analysis.	
Recommended reading: Gilbert A. Churchill, Jr; Dawn Iacobucci, Marketing Research. Methodological Foundation, South Western Thomson Corporation, 2005	

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Course name: Financial Accounting	
Course available with minimum number of 4 participants.	
Course code: ZL023	Form of class: Lecture, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 6	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Zygmunt Aleksandra, a.zygmunt@po.opole.pl Zygmunt Justyna, j.zygmunt@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of enterprise financial activity and microeconomics	
Objectives of the course and learning outcomes: Understanding the essence, rules and financial accountancy instruments; usage financial accountancy instruments in management's problems solving	
Teaching program: Accountancy essentials and principles. Enterprises' assets and funds. Balance sheet. Balance and profit and loss accounts. Economic events. Bases of accounts functioning. Accounts scheme. Recording of liquid assets, stocks, receivables and liabilities, stockpiles, capital assets. Costs. Income statement. Methods of financial result calculation. Profit and loss account. Financial statements reporting	
Assessment methods: Constant evaluation of student's work. Final test in the end of semester. Duration and test date is given on the first class	
Recommended reading: a) P. Weetman, Financial Accounting, Pearson, 2006, 4th edition. b) B. Elliot, J. Elliott, Financial Reporting, Person, 2005, 10th edition. c) R. Lewis, D. Pendrill, Advanced Financial Accounting, Pearson, 2003	

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Course name: Corporate Finance	
Course available with minimum number of 4 participants.	
Course code: ZL024	Form of class: Lecture, Group tutorial,
Level of study: basic	Duration: 1 semester
Number of ECTS credits: 7	Start date: October, February
Number of hours per week: 4	Number of hours per semester: 60
Language of instruction: English	
Name of the lecturer and contact information: Zygmunt Aleksandra, a.zygmunt@po.opole.pl Zygmunt Justyna, j.zygmunt@po.opole.pl	
Prerequisites: English (min B1 level), Basic knowledge of enterprise financial activity and microeconomy	
Objectives of the course and learning outcomes: The usage of financial rules and methods to manage enterprises and their finance	
Teaching program: Corporate finance issues and problems. Finance and investment principles – debt capital and its gaining process. Shares and bonds issues. Cost of capital. Methods of investment evaluation. Short-term corporate finance management - current receivables and current liabilities management. Functional analysis of a corporate (financial and branch indicators). Corporate tax strategies	
Assessment methods: Constant evaluation of student's work. Final test in the end of semester. Duration and test date is given on the first class	
Recommended reading: a) J. Van Horne, J. Wachowicz, Fundamentals of Financial Management, 2004, 12th edition b) A. Damodaran, Applied Corporate Finance, WILEY 2006 c) J. E. Edwin, Modern Portfolio Theory and Investment Analysis, Wiley 2004 d) D. Dayananda, R. Irons, S. Harrison, J. Herbohn, P. Rowland, Capital Budgeting. Financial Appraisal Of Investment Projects, CAMBRIDGE 2002	

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Course name: Finansy przedsiębiorstwa	
Course available with minimum number of 4 participants.	
Course code: ZL024/R	Form of class: Lecture, Seminar,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 7	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: Russian	
Name of the lecturer and contact information: Sytnik Inessa, i.sytnik@po.opole.pl	
Prerequisites: English (min B1 level), Imięt bazowyj znanija osnow teorii i metodologii w ramach swiazanych naucznych dyscyplin mikroekonomika, makroekonomika, finansy, menedżment. Obladat znanijem form, prawil, charakterom miechanizmow funkcyonirowania organizacii. Ponimat rol uprawlienija w sowriemiennoj finansowej naukie.	
Objectives of the course and learning outcomes: Formirowanie sistemi bazowych znanij po teorii i praktike finansowych odnoszenij subiektow hozjajstwowanija, formirowanija finansowych riesursow, finansowego planirowanija, organizacii finansowej i inwiesticyonnoj diejatielnosti priedprijatij.	
Teaching program: 1. Wwiedienije w finansy priedprijatij – oblasti uprawlienijem priedprijatijem, cel, funkcyi i rol finansowego menedżmenta, kriterii maksimalizacii stoimosti priedprijatija (2 cz -lek, 2 cz - pr.z.). 2. Kratkostrocznyje i dolgostrocznyje istoczniki finansirowanija priedprijatija (2 cz -lek, 2 cz - pr.z.). 3. Prawowyje uslowija prieliecienija kapitala putiom wypuska ajcy i obligacii na finansowom rynku (2 cz -lek, 2 cz - pr.z.). 4. Dochody i raschody priedprijatija (2 cz -lek, 2 cz - pr.z.). 5. Pribyl i rientabielnost priedprijatija (2 cz -lek, 2 cz - pr.z.). 6. Osnowy finansowego analiza (2 cz -lek, 2 cz - pr.z.). 7. Analiz finansowego sostojanija priedprijatija (2 cz -lek, 2 cz - pr.z.). 8. Uprawlienije likwidnostju kompanii – suścnost i rol oborotnogo kapitala (2 cz -lek, 2 cz - pr.z.). 9. Uprawlienije dieńeznymi sriedstwami, diebitorskoj zadolżenostju i towarno-matierialnymi zapasami priedprijatija (4 cz - lek, 4 cz - pr.z.). 10. Uprawlienije riskami priedprijatija (2 cz -lek, 2 cz - pr.z.). 11. Postojannyje aktiwy – princypy ocenki i uprawlienija (4 cz -lek, 4 cz - pr.z.). 12. Uprawlienije inwiestycijami priedprijatija (4 cz -lek, 4 cz - pr.z.).	
Assessment methods: Polożytielnaja ocenka testa (polucienije nie mienieje 50% ballow), zaciot prakticieskich zaniatij.	
Recommended reading: [1] Kowalow W., W, Kowakow Wit . W. K56 Finansy organizacii (priedprijatij): — M.: TK Weja-bi, Izdatielstwo Prospiekt, 2006.— 352 s. (http://www.al24.ru/wp-content/uploads/2013/02/ков_1.pdf) [2] Solowjow W. I. Finansy priedprijatij i domasznich hozjajstw: Uciebnoje posobije. – M., 2006. – 157 s. (http://visoloviev.ru/booksmath/FinKred2.pdf) [3] Ekonomika i Finansy priedprijatija: Uciebnik pod red. T. S. Nowaszynoj. - M.: "Moskowskij finansowo- promysziennyj uniwersitet "Sinergia", 2014 – 205 s. (http://fksevtu.ru/assets/files/novashina.pdf)	

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Course name: Decision making processes in management.	
Course available with minimum number of 4 participants.	
Course code: ZL034	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Jasińska-Biliczak Anna, a.jasinska-biliczak@po.opole.pl	
Prerequisites: English (min B1 level), Knowledge of principles of decision making process	
Objectives of the course and learning outcomes: Students learn how to use knowledge about decision making process in professional work and how to move into practise.	
Teaching program: New philosophy of management. Problems of enterprises. Priorities of problems' solutions. Problems' solutions and making of management conceptions. Reality in actions. Methods and technics of decision making process - theory. Methods and technics of decision making process - casus (practical actions). Acting in conditions of trust crisis. Place of manager in decision making process. Factors and barriers of decision making process.	
Assessment methods: -credit based on students participation in classes, -practical tasks, -activity.	
Recommended reading: Abelson, R.P.,	

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Course name: Innovation in Business	
Course available with minimum number of 4 participants.	
Course code: ZL035	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Karaś Elżbieta, e.karas@po.opole.pl	
Prerequisites: English (min B1 level), Knowledge of basic enterprise management	
Objectives of the course and learning outcomes: Preparing students to find ways of solving problems in area of innovation management and to recognize types and models of innovation and technology transfers.	
Teaching program: Introduction – theoretic basis of innovation Innovation and creativity in enterprises Process of innovation in enterprises Knowledge, technological changes Sources of technological changes Innovation dynamics and the evolution of industries Technological changes Technology diffusion and technology transfer Innovation dynamics in the World Economy	
Assessment methods: Lecture and multimedia presentations, group discussions, case studies, preparing papers	
Recommended reading: Imai M.: Kaizen. The Key to Japan's Competitive Success, New York 2007 Liker J. K.: Toyota Way, New York 2003 Prahalad C.K.: The New Age of Innovation, The McGraw-Hill 2008 Trott P.: Innovation Management and New Product Development, Prentice Hall, New York 2008	

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Course name: Marketing in trade and services	
Course available with minimum number of 4 participants.	
Course code: ZL037	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Karaś Elżbieta, e.karas@po.opole.pl	
Prerequisites: English (min B1 level), Basics of marketing, basics of management	
Objectives of the course and learning outcomes: The most important goal of the subject is for students to understand the importance of a Marketing in the organization, its general concept and presence in life, methods of Market research used to improve functioning of organization	
Teaching program: Definition of services. Types of services. Positioning. Choosing target market. marketing-mix in service industries. Service consumer behavior. Pricing of services. Measuring service marketing efficiency. Merchandising. Definition of trade and industry. Marketing in trade	
Assessment methods: Case study, writing exam	
Recommended reading: A. Gilmore, Services marketing and management, Sage Publications, 2003 C. Gronross, Service management and Marketing/ A customer relationship management approach. 2nd edition, Wiley 2000 C. Lovelock, J. Wirtz, Services marketing. People, Technology, Strategy, 6th edition, Pearson, Prentice Hall, 2007	

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Course name: PR techniques, autopresentation, public speaking	
Course available with minimum number of 4 participants.	
Course code: ZL039	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Jasińska-Biliczak Anna, a.jasinska-biliczak@po.opole.pl Klemens Brygida, b.klemens@po.opole.pl	
Prerequisites: English (min B1 level), -	
Objectives of the course and learning outcomes: Students learn: how to communicate in a good way, how to be a good speaker, how to prepare to a public speech; what skills need to have a relation practitioner, etc.	
Teaching program: Definitions and history of public relations; Understanding public relations; PR ethics; PR media skills; Role of the public relation practitioner; Role of the communicator; Practice: presenting, public speaking; Why speak in public? Gathering supporting materials; Introductions and conclusions; Relaxation methods	
Assessment methods: - group work and discussions with students, - audiovisual techniques, - case studies, - problem solving.	
Recommended reading: C. L. Griffin, Invitation to a public speaking, Boston 2012; P. Henslowe, Public Relations. A practical guide to the basics, The Institute of Public Relations, London 2003; T. Morris, S. Goldsworthy, PR Today. The Authoritative Guide to Public Relations, Palgrave Macmillan, New York 2012; R. Tench, L. Yeomans, Exploring Public Relations, Prentice Hall, Harlow 2006;	

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Course name: Ergonomics	
Course available with minimum number of 4 participants.	
Course code: ZL040	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Polek-Duraj Kornelia, k.polek-duraj@po.opole.pl	
Prerequisites: English (min B1 level), -	
Objectives of the course and learning outcomes: The goal of this course is to provide students with the basis of occupational ergonomics considerations in design, ergonomic considerations in redesign and research basis of ergonomics Upon successful completion of this course, the student will be able to: - describe an expanded view of ergonomics which encompasses more than ergonomically related injuries but all parts of assuring that the workplace fits the worker put ergonomic assessments and solutions to practical use in the workplace, and - Be capable of initiating evaluations of ergonomic issues and working with an ergonomist	
Teaching program: - General Principles (Aims, objectives and benefits of ergonomics, Definition and scope of ergonomics and systems of work, The role of the ergonomist, Fitting the job to the person and the person to the job, Teamwork and ageing, Interfaces between job, person and environment) - Biological Ergonomics - Psychology (Perception of risk, Motivation and behaviour, Memory, Signal Detection Theory and vigilance, 'Work 'Stress' - causes, preventative and protective measures) - Developing an Ergonomics Strategy at Work - Ergonomics Methods and Technique - Workplace, Job and Product Design - Relevant Physical Factors of the Work Environment - Standards and Social Aspects	
Assessment methods: Class Participation	
Recommended reading: - R.S. Bridger, Introduction to ergonomics, 2003 - William S. Marras, Waldemar Karwowski, Fundamentals and assessment tools for occupational ergonomics, 2006. - Ruud N. Pikaar, Meeting diversity in Ergonomics, 2007. - Céline McKeown, Office Ergonomics, Practical Applications 2008.	

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Course name: Process Management	
Course available with minimum number of 4 participants.	
Course code: ZM007	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Karaś Elżbieta, e.karas@po.opole.pl	
Prerequisites: English (min B1 level), Knowledge of basic enterprise management	
Objectives of the course and learning outcomes: Preparing students to find ways of solving problems in area of process management and to recognize types of process in enterprise and to use method of improvement them.	
Teaching program: The course will explain management systems and business process analysis, systems design and methods of implementation. It will provide a basic knowledge and understanding of how to design, test and implement systems for business process.	
Assessment methods: Oral and individual or group presentation	
Recommended reading: Davenport T. (1993). Process Innovation: Reengineering work through information technology. Harvard Business School Press, Boston. Hammer M., Champy J. (1993). Reengineering the Corporation: A Manifesto for Business Revolution, Harper Business Hammer M., Champy J. (2000). Reengineering – radical change of firm. Oxford: Management Press. Kaplan R.S., Norton D.P. (1996). The Balanced Scorecard. Boston: Harvard Business Press. Rummler G., Brache A. (1995). Improving Performance: How to manage the white space on the organizational chart. Jossey-Bass, San Francisco.	

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Course name: Marketing in Business	
Course available with minimum number of 4 participants.	
Course code: ZM008	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 4	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Wielki Janusz, j.wielki@po.opole.pl	
Prerequisites: English (min B1 level), ---	
Objectives of the course and learning outcomes: After completing the course the student will have the ability to recognize and implement the instruments of marketing within an enterprise; He/she will have the ability to think and act in rational and entrepreneurial way as well as realize marketing tasks. He/she will also have the knowledge regarding marketing, marketing strategies, and channels.	
Teaching program: - Marketing: Creating and Capturing Customer Value - Company and marketing strategy: Partnering to Build Customer Value and Relationships - Analyzing the marketing environment - Managing marketing Information to Gain Customer Insights - Understanding Consumer and Business Buyer Behavior - Customer-Driven marketing strategy: Creating Value for Target Customer - Products, services, and Brands: Building Customer Value - New Product Development and Product life-Cycle strategies - Pricing: Understanding and Capturing Customer Value - Marketing Channels: Delivering Customer Value - Retailing and Wholesaling - Engaging Consumers and Communicating Customer Value: Advertising and Public Relations - Direct, online, social media, and mobile marketing	
Assessment methods: Written exam	
Recommended reading: G. Armstrong, P. Kotler, Marketing – an introduction, 2015.	

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Course name: Psychology of motivation	
Course available with minimum number of 4 participants.	
Course code: ZM035	Form of class: Lecture, Group tutorial,
Level of study: undergraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Polek-Duraj Kornelia, k.polek-duraj@po.opole.pl	
Prerequisites: English (min B1 level), -	
Objectives of the course and learning outcomes: At the conclusion of this course, students should be able to: (1) Identify the major theoretical approaches and theoreticians in the contemporary fields of motivation; (2) Delineate the contributions of culture and physiology to an understanding of these phenomena; (3) Have a basic understanding of the design and implementation of research methodology appropriate to the study of motivation; (4) Conversant with applications of the theoretical information in real-life situations.	
Teaching program: -Introduction to Motivation and Emotion - Meaning of Motivation; Sources of Motivation; Study of Motivation and Emotion - Evolution of Universal Motives - Drives, Needs, and Awareness - Types of Motivation	
Assessment methods: - group work and discussions with students, - case studies, - problem solving.	
Recommended reading: - L. Deckers, Motivation: Biological, Psychological, and Environmental	

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Course name: Corporate Social Responsibility	
Course code: ZM049	Form of class: Lecture, Group tutorial,
Level of study: postgraduate	Duration: 1 semester
Number of ECTS credits: 5	Start date: October, February
Number of hours per week: 2	Number of hours per semester: 30
Language of instruction: English	
Name of the lecturer and contact information: Maj Jolanta, j.maj@po.opole.pl	
Prerequisites: English (min B1 level), English (min B1 level)	
Objectives of the course and learning outcomes: This course provides insights and experience into corporate social responsibility. Course objectives are to: Provide an understanding of the key issues of CSR. Learn and apply key elements stakeholder management and stakeholder engagement. Learn how to prepare a CSR Report.	
Teaching program: 1. Overview – CSR, international law, (including human rights law) and global business operations 2. Drivers of and Context for CSR: Key Players and linkages to Laws, Norms,	
Assessment methods: Constant evaluation of student's work. Final test in the end of semester.	
Recommended reading: Porter M., Kramer M., 2006. Strategy and Society – The link between Competitive advantage and Corporate Social Responsibility Freeman E., 2010. The Stakeholder theory and the Modern Corporation Mintzberg H. 2009. Rebuilding companies as communities – Harvard Business Review - Mintzberg H. 2015. Why Corporate Social Responsibility Isn't a Piece of Cake – Harvard Business Review.	

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