Title	Code
Technologiers of Water	**1010101241010130348**
Field: **Environmental Engineering First-cycle Studies**	Year / Semester: **2 / 4**
Specialty: **-**	Course: **core**
Hours: Lectures: **2** Classes: **-** Laboratory: **-** Projects / seminars: **2**	Number of credits: **6**
	Language: **polish**

Lecturer:

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Status of the course in the study program:

Core course

Assumptions and objectives of the course:

Knowledge of water treatment processes as well as principles of design and operation of water treatment facilities. Creation an ability for solving problems concerning designing, investment and operation of installation and facilities of water treatment plants, including sludge management.

Contents of the course (course description):

Water treatment technology: basic terminology, meaning, goals and place in water-wastewater management, water recovery. Water sources and quality: surface water, groundwater, infiltration water, contaminants and water quality indicators, physical, chemical and biological contamination, water quality protection. Drinking water quality requirements: WHO requirements, EU Directive, Polish Health Ministry Directive. Processes and object of water treatment: coagulation, storage and installation of reagents, mixing tanks, flocculation tanks; sedimentation, rectangular and vertical clarifiers, sludge blanket clarifiers, tube settler; slow sand filtration, rapid filtration, direct filtration, rapid filters, granular carbon filters, filtration materials, filter backwashing, drainage systems; water aeration, devices for aeration of water, iron and manganese removal technology, Filters for iron and manganese removal; disinfection, chlorine, chlorine dioxide, ozone, disinfection byproducts, UV-disinfection. Water treatment plants: location and protection zones, site arrangement, sludge management.

Introductory courses and the required pre-knowledge:

Environmental Chemistry, Environmental Biology and Ecology, Fluid Mechanics, Materials Technology.

Courses form and teaching methods:

Presentation of lectures. Design exercises.

Form and terms of complete the course - requirements and assessment methods:

Exam (written and spoken), Defence of design and verification of theoretical knowledge.

Basic Bibliography:

1. Z. Heidrich i inni Urządzenia do uzdatniania wody Arkady Warszawa 1987
2. AWWA, Technical Editor F. W. Pontius Water Quality and Treatment McGraw-Hill, Inc New York 1990
3. A.L. Kowal, M. Świderska-Bróż Oczyszczanie wody PWN Warszawa-Wrocław 1996

4. praca zbiorowa Wodociągi i Kanalizacja w Polsce, tradycja i współczesność Polska Fundacja Odnowy Zasobów Wodnych Poznań-Bydgoszcz 2002
5. MWH Water Treatment, Principles and Design John Wiley and Sons, Inc. Hoboken, New Jersey 2005
6. H. Majcherek Podstawy hydromechaniki w inżynierii oczyszczania wody Wydawnictwo Politechniki Poznańskiej Poznań 2006

Additional Bibliography: