

**Course name: Catchment Hydrology**

ECTS	4.0
Course status	<i>facultative</i>
Course final assessment /evaluation of outcomes	<i>Graded credit</i>
Prerequisite	<i>knowledge and skills in mathematics, meteorology and climatology</i>

**Main field of study: Engineering and Water Management**

Educational profile	<i>General academic</i>
Code of studies and education level	<i>bachelor</i>
Semester of studies	<i>winter</i>
Language of instruction	<i>English</i>

**Course offered by:**

Name of faculty offering the course	<i>Faculty of Environmental Engineering and Land Surveying</i>
Name of department offering the course	<i>Department of Sanitary Engineering and Water Management</i>
Course coordinator	<i>Dr. Eng. Agnieszka Cupak, Ph.D.</i>

**Learning outcomes:**

Symbol of outcome	Description of the learning outcome	Reference to main field of study outcomes	Area symbol*
<b>KNOWLEDGE – student knows and understands:</b>			
CAH_K1	<i>cycle of water circulation in the catchment and individual components included in it; hydrological characteristics of rivers, catchment areas and statistical methods for hydrological data analysis; basic hydrological models and topics related to water quality in watercourses and surface reservoirs.</i>	<i>IGW1_W04</i>	<i>T</i>
<b>SKILLS – student is able to:</b>			
CAH_S1	<i>calculate hydrological characteristics and selected quality parameters of surface water resources.</i>	<i>IGW1_U01 IGW1_U02</i>	<i>T</i>
<b>SOCIAL COMPETENCIES – student is ready to:</b>			
CAH_C1	<i>creative solving of unusual problems in management of water resources in the river basin.</i>	<i>IGW1_K04</i>	<i>T</i>

**Teaching contents:**

Lectures:	15 hours
Topics	<i>Catchment water balance, including precipitation, evapotranspiration, infiltration and outflow. Water balance of Poland. Annual drainage and retention cycle. Hydrological cycle processes in the catchment. Hydrological characteristics of rivers. Catchment characteristics. Impact of physical conditions on the hyetograph of the outflow</i>

from the catchment. River network. Hydrology of small catchments. Small uncontrolled catchments. Swamp catchments.  
 Statistical analysis of hydrological data. Methods for estimating flows.  
 Extreme phenomena (floods and droughts).  
 Basic information about modeling in the catchment. Hydrological models.  
 Energetic use of watercourses.  
 Methods for determining environmental and inviolable flow.  
 The quality of flowing and standing surface waters. Catchment areas with predominance of swampy areas.

Accomplished learning outcomes	CAH_K1; CAH_C1
Means of verification, rules and criteria of assessment	Single-choice test, positive assessment should be given at least 50% of correct answers to given questions: <50% – insufficient (2.0); 50–60% – sufficient (3.0); 61–70% – satisfactory plus (3,5); 71–80% – good (4.0); 81–90% – good plus (4,5); 91–100% – very good (5.0). The share of the lecture grade in the final grade is 50%.

Classes: 15 hours

Topics	Relationship between two corresponding water cross-sections to complete missing data. Preparation of the duration curve. Calculation of maximum flows by empirical methods with probability of exceed. Calculation of the oxygen curve for the treated wastewater receiver.
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Accomplished learning outcomes	CAH_S1
Means of verification, rules and criteria of assessment	Passing 4 reports on exercises – a grade from exercises is an arithmetic average of formative grades. The share of the grade for the project exercises in the final grade of the subject is 50%.

#### References:

Basic	1. Soczyńska U. 1997. <i>Hydrologia dynamiczna</i> . PWN, Warszawa. 2. Ven Te Chow, Maidment D., Mayhs L. W. 2013. <i>Applied hydrology</i> . McGraw-Hill. 3. Maidment D. V. 1993. <i>Handbook of Hydrology</i> . McGraw-Hill.
Supplementary	1. Ferrier R. C., Jenkins A. 2010. <i>Handbook of Catchment Management</i> . Wiley-Blackwell. 2. Ozga-Zielińska M., Brzeziński J. 1997. <i>Hydrologia stosowana</i> . PWN, Warszawa.

#### Structure of learning outcomes:

Area of academic study: R – Agricultural, forestry and veterinary sciences	0.0 ECTS**
Area of academic study: T – technical sciences	4.0 ECTS**

#### Structure of student activity:

Contact hours	35	hrs.	1.4	ECTS**
Including: lectures	15	hrs.		
classes and seminars	15	hrs.		
consultations	2	hrs.		
participation in research	0	hrs.		
obligatory traineeships	0	hrs.		
participation in examination	3	hrs.		
e-learning	0	hrs.	0.0	ECTS**
student own work	65	hrs.	2.6	ECTS**

\*Areas of academic study in the fields of: A – the arts; H – humanities; M – medical, sport and health sciences; N – natural sciences; P – biological sciences; R – agricultural, forestry and veterinary sciences; S – social studies; T – engineering and technology

\*\* stated with an accuracy to 0.1 ECTS, where 1 ECTS = 25–30 hours of classes