



## Subject card

|  |  |   |                                       |                                     |  |            |     |
|--|--|---|---------------------------------------|-------------------------------------|--|------------|-----|
| Subject name and code  | Hydraulics and Hydrology II, PG_00044310   |   |                                       |                                     |  |            |     |
| Field of study   | Civil Engineering  |   |                                       |                                     |  |            |     |
| Date of commencement of studies  | October 2022   | Academic year of realisation of subject   |                                       |                                     | 2022/2023  |            |     |
| Education level  | second-cycle studies   | Subject group   |                                       |                                     | Obligatory subject group in the field of study     |            |     |
| Mode of study  | Part-time studies  | Mode of delivery  |                                       |                                     | blended-learning                                   |            |     |
| Year of study  | 1  | Language of instruction   |                                       |                                     | Polish   |            |     |
| Semester of study  | 1  | ECTS credits  |                                       |                                     | 3.0  |            |     |
| Learning profile   | general academic profile   | Assessment form   |                                       |                                     | assessment   |            |     |
| Conducting unit  | Department of Geotechnical and Hydraulic Engineering -> Faculty of Civil and Environmental Engineering   |   |                                       |                                     |  |            |     |
| Name and surname of lecturer (lecturers)   | Subject supervisor   |   | dr inż. Witold Sterpejkowicz-Wersocki |                                     |  |            |     |
|  | Teachers   |   | dr inż. Witold Sterpejkowicz-Wersocki |                                     |  |            |     |
| Lesson types and methods of instruction  | Lesson type  | Lecture   | Tutorial                              | Laboratory                          | Project  | Seminar    | SUM |
|  | Number of study hours  | 15.0  | 10.0                                  | 0.0                                 | 0.0  | 0.0        | 25  |
|  | E-learning hours included: 12.0  |   |                                       |                                     |  |            |     |
| Hydraulika i Hydrologia II - 2021/22 - Moodle ID: 14568<br><a href="https://enauzanie.pg.edu.pl/moodle/course/view.php?id=14568">https://enauzanie.pg.edu.pl/moodle/course/view.php?id=14568</a> |  |   |                                       |                                     |  |            |     |
| Learning activity and number of study hours  | Learning activity  | Participation in didactic classes included in study plan  |                                       | Participation in consultation hours |  | Self-study | SUM |
|  | Number of study hours  | 25  |                                       | 5.0                                 |  | 45.0       | 75  |
| Subject objectives   | The aim of the course is to acquire and expand knowledge and skills related to the description of hydraulic and hydrological processes.  |   |                                       |                                     |  |            |     |
| Learning outcomes  | Course outcome   | Subject outcome   |                                       |                                     | Method of verification                             |            |     |
|  | [K7_U10] can analyse complicated environmental loads acting on a construction; can apply proper processes to design marine and hydroengineering constructions taking into consideration hydrological and hydraulic impact  | Student is able to choose the appropriate calculation method to solve the problem in the field of surface and underground water hydraulics and hydrology. Performs basic calculations related to hydrology as outflow from the catchment area, flows in rivers including design flows for the purpose of designing damming constructions and the development of hydrological information for other hydrotechnical projects. |                                       |                                     | [SU2] Assessment of ability to analyse information |            |     |
|  | [K7_W11] has deep knowledge of marine and inland hydrotechnical constructions; has knowledge about hydraulic and hydrological constraints in design and exploitation of buildings  | The student has extended knowledge related to the processes taking place in the catchment, flood water retention and flows in rivers in connection with hydrotechnical constructions.   |                                       |                                     | [SW1] Assessment of factual knowledge              |            |     |
| Subject contents   | <p><b>LECTURE</b><br/>Water in the ground and groundwater hydraulics, infiltration. Outflow from the catchment. Effective rainfall and surface runoff, temporary unit hydrogram. Flow in rivers, non-homogeneous and undetermined flow. Transformation of flood waves in rivers. Reservoir retention. Flow curve. States and characteristic flows in rivers. Transport of debris in rivers. Termics and ice phenomena in rivers and lakes.</p> <p><b>EXERCISES</b><br/>Calculation of water seepage in the earth dam. Calculation of the outflow from the catchment. Dimensioning of retention reservoirs. Hydraulic dimensioning of the culvert and devices for dissipating water energy below the culvert.</p> |   |                                       |                                     |  |            |     |
| Prerequisites and co-requisites  | Knowledge of subjects: fluid mechanics, hydraulics and hydrology (previous course), mathematics.   |   |                                       |                                     |  |            |     |

| Assessment methods and criteria                                | Subject passing criteria                | Passing threshold  | Percentage of the final grade |
|--|---|--|-------------------------------|
|  | Written colloquium. Duration 45 minutes | 60.0%  | 100.0%                        |
| Recommended reading  | Basic literature                        | <ol style="list-style-type: none"> <li>1. Byczkowski A.: Hydrologia, Tom 1, Tom 2, Wydawnictwo SGGW, Warszawa 1996</li> <li>2. Szymiewicz R., Gąsiorowski D.: Podstawy hydrologii dynamicznej, Wydawnictwo WNT, Warszawa 2016</li> <li>3. Mitosek M.: Mechanika płynów w inżynierii środowiska, Wydawnictwo Naukowe PWN, Warszawa 2001.</li> <li>4. Ozga-Zielińska M., Brzeziński J.: Hydrologia stosowana, Wydawnictwo Naukowe PWN, Warszawa 1994.</li> <li>5. Sawicki J.: Przepływy ze swobodną powierzchnią, PWN Warszawa 1998.</li> <li>6. Lambor J.: Hydrologia inżynierska, Wydawnictwo ARKADY, Warszawa 1971</li> </ol> |                               |
|  | Supplementary literature                | <ol style="list-style-type: none"> <li>1. Kubrak J.: Hydraulika techniczna, SGGW Warszawa 1998.</li> <li>2. Szymkiewicz R.: Modelowanie matematyczne przepływów w rzekach i kanałach, Wydawnictwo Naukowe PWN Warszawa, 2000.</li> <li>3. Sobota J.: Hydraulika i Hydrologia, Wydawnictwo Uniw. Przyrodniczy we Wrocławiu, Wrocław 2004</li> </ol>   |                               |
|  | eResources addresses                    |  |                               |
| Example issues/<br>example questions/<br>tasks being completed |   |  |                               |
| Work placement   | Not applicable                          |  |                               |