**SYLLABUS** (MODULE-ERASMUS+)

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| Course/module (as specified in the approved curriculum for the field of study)  **Applied hydrology** | | | | | | ECTS  **3** | | Component code  **ENVI 2.5** | |
| Name in Polish  **Hydrologia stosowana** | | | | | |
| Unit(-s) providing the course/module (Faculty, Institute/Department)  **Faculty of Environmental and Mechanical Engineering, Department of Hydraulic and Sanitary Engineering** | | | | | | | | | |
| Head of course/module (e-mail address)  **Tomasz Dysarz, PhD (**[**tomasz.dysarz@up.poznan.pl**](mailto:tomasz.dysarz@up.poznan.pl)**)** | | | | | | | | | |
| Other teachers  **-** | | | | | | | | | |
| Course category  **Open** | | Language  **English** | | Level  **Bachelor/Master** | Profile  **Academic-general** | | Semester  **Winter/summer** | | |
| **TYPE OF CLASSES/LECTURES AND THE NUMBER OF HOURS**  (organised classes/lectures and self-study) | | | | | | | | | |
| Type of studies: full-time | | |  | Type of studies: extramural | | | | |  |
| * lectures | | | 15 | * lectures | | | | | - |
| * practical classes | | | 15 | * practical classes | | | | | - |
| * field exercise | | |  | * field exercise | | | | | - |
| * other lessons | | | - | * other lessons | | | | | - |
| * self-study | | | 45 | * self-study | | | | | - |
| Total number of hours: | | | 75 | Total number of hours: | | | | | - |
| **PRE-REQUSITES**  Basics of mathematics and physics. | | | | | | | | | |
| **OBJECTIVE OF COURSE/MODULE**  Presentation of fundamental concepts of hydrological analyses applied in river engineering; Presentation of selected methods for the hydrological assessment; | | | | | | | | | |
| **TEACHING METHODS**  Lectures in the form of presentations with real examples; Classes with application of modern computational methods and software used for solution of problems related to hydrological assessment. Possibility to use distance learning tools and techniques. | | | | | | | | | |
| **LEARNING OUTCOMES** | | | | | | | Reference  to field outcomes | | |
| Knowledge | O1: Students will have advanced knowledge about water flow in the environment with special emphasis on rivers and river systems.  O2: Students will discover advanced methods for hydrological assessment.  O3: Students will know the sources of flow related hazards. | | | | | | Not  applicable | | |
| Skills | O4: Students will have skills to determine the average and extreme amount of water in the system with help of mathematical models for river simulation.  O5: Students will be able to suggest techniques and methods for improvement in water supply and flood protection. | | | | | | Not  applicable | | |
| Social  competences | O7: Students will understand importance of social, professional and ethical responsibility for state of the environment; Student understands the need for explaining to the community the rules and sustainable use of the environment including importance of the environmental engineering.  O8: Students will be able to identify and assess the problems related to his/her professional activity. | | | | | | Not  applicable | | |
| **METHODS TO VERIFY LEARNING OUTCOMES**  Preparation of report describing exercise done in classes  Basic test on application of computational methods explained during the classes  Written exam in the form of the test | | | | | | | Outcome Reference  Numbers  O1 – O8 | | |
| **TEACHING CONTENT**  **Lectures**: Fundamental classification of river systems; Mechanisms of mass and energy transport; Basics of river flow process; Elements of river flow assessment: gauge stations, hydrometric measurements; Rating curve; Collection and processing of hydrologic data; Concepts of hydrologic systems; Unit hydrograph; River flow regime; Extreme events and probability of exceedance; Flood wave propagation  **Practical classes:** Basis hydrological calculations and classifications; Application of GIS in hydrology; Configuration of basic hydrologic model. | | | | | | | | | |
| **Forms and criteria for passing of course/module**  The evaluation of the classes is composed of two elements:  (1) written report on exercise explained during the classes  (2) test on usage of computer model or computational technique of other form presented during the classes.  The positive evaluation of the classes is necessary to access the final exam. | | | | | | | Percentage of final mark  10% written report  20% test on computer model  70% final exam | | |
| **LIST OF LITERATURE**   1. Chow V.T., Maidment D., Mays L. (1988): *Applied Hydrology*, McGraw-Hill 2. Szymkiewicz R. (2010): *Numerical Modelling in Open Channel Hydraulics*, Springer 3. Wu W. (2008): *Computational River Dynamics*, Taylor & Francis Group 4. Feldman A.D. (ed.) (2000): *Hydrologic Modelling System HEC-HMS Technical Reference Manual*, Report no. CPD-74B, US Army Corps of Engineers, Hydrologic Engineering Center (HEC), Davis CA | | | | | | | | | |