

## Annex 6

### DISCIPLINE DESCRIPTION

#### 1. Information on the study programme

1.1 Academic institution	<b>UNIVERSITY OF ORADEA</b>
1.2 Faculty	<b>FACULTY OF ENVIRONMENTAL PROTECTION</b>
1.3 Department	<b>ENVIRONMENTAL ENGINEERING</b>
1.4 Field of study	<b>ENVIRONMENTAL ENGINEERING</b>
1.5 Cycle of study	<b>BACHELOR</b>
1.6 Study programme/Qualification	<b>ENGINEERING OF BIOTECHNICAL AND ECOLOGICAL SYSTEMS / ENGINEER</b>

#### 2. Information on the discipline

2.1 Name of discipline	<b>Hydrology and Hydrogeology I</b>						
2.2 Course holder	<b>Lecturer Nandor Köteles Eng., Ph.D</b>						
2.3 Seminar/Laboratory/Project holder	<b>Lecturer Nandor Köteles Eng., Ph.D</b>						
2.4 Year of study	<b>I</b>	2.5 Semester	<b>II</b>	2.6 Type of evaluation	<b>Ex</b>	2.7 Regime of discipline	<b>DD</b>

(C) Compulsory; (O) Optional; (E) Elective

#### 3. Total estimate time (hours per semester of didactic activities)

3.1 Number of hours per week	<b>3</b>	out of which: 3.2 course	<b>2</b>	out of which 3.3 seminar/laboratory/project	<b>1</b>
3.4 Total hours in the curriculum	<b>42</b>	out of which: 3.5 course	<b>28</b>	out of which 3.6 seminar/laboratory/project	<b>14</b>
Time allotment					hours
Study assisted by manual, course support, bibliography and notes					<b>30</b>
Additional documentation in the library/ on specialised electronic platforms and in the field					<b>20</b>
Preparation of seminars/laboratories/ topics/reports, portfolios and essays					<b>10</b>
Tutorship					<b>20</b>
Examinations					<b>3</b>
Other activities.....					<b>1</b>
<b>3.7 Total hours of individual study</b>	<b>84</b>				
<b>3.9 Total hours per semester</b>	<b>140</b>				
<b>3.10 Number of credits</b>	<b>4</b>				

#### 4. Prerequisites (where appropriate)

4.1 curriculum	(Conditioning) Ecology, Meteorology.
4.2 competences	Familiarize future specialists in the supervision and management of environmental factors with concepts and methods of water research.

**5. Conditions** (where appropriate)

5.1. related to course	Videoprojector, Screen.
5.2. related to seminar/laboratory/ project	Apparatus for conducting laboratory hours; Knowledge of the notions contained in the laboratory work to be carried out.

<b>6. Specific competences acquired</b>	
Professional competences	C1.2 Use of basic scientific knowledge in defining and explaining concepts specific to engineering and environmental protection C2.2 Explaining and interpreting basic concepts, methods and models in environmental engineering issues C3.4 Use of appropriate analysis methods to characterize environmental factors C4.3 Identification of interdependencies between pollutants and environmental effects C5.5 Elaboration of professional projects using the modeling and simulation methods of environmental processes C6.1 Identification and specification of information on the best available technology in the field
Transversal competences	CT2. Identificarea rolurilor si responsabilităților într-o echipa pluridisciplinara și aplicarea de tehnici de relaționare și munca eficientă în cadrul echipei

**7. Objectives of discipline** (coming from the specific competences acquired)

7.1 General objective	<ul style="list-style-type: none"> <li>• knowledge of the water circuit in nature, the distribution of water on the globe, and the general classification of waters.</li> <li>• knowledge of underground water dynamics, underground water hydrogeology.</li> <li>• knowledge of aquifer morphology, hydrodynamics and hydro-geochemistry of groundwater.</li> </ul>
7.2 Specific objectives	Acquiring knowledge to enable: <ul style="list-style-type: none"> <li>• be able to take samples of water by various methods ensuring that the harvested samples are representative of the characterized assembly;</li> <li>• Identify and understand the main leak components; superficial leakage, hypodermic leakage, underground leakage and leakage;</li> <li>• Knowledge of the hydrographical response to climate</li> </ul>

	<p>impulses and the persistence of climatic deviations;</p> <ul style="list-style-type: none"> <li>• Formation and evolution of the seasonal regimes: large waters, small summer-autumn waters, small winter waters;</li> <li>• Students' initiation in applied problems of measurements, calculations and hydrological representations.</li> </ul>
--	---

## 8. Content\*/

8.1 Course	Methods of teaching	No. of hours/Remarks
1. General Hydrological Elements The Purpose of Hydrology, Hydrology Interaction with Related Sciences, Hydrology Research Procedures, Hydrology History, Hydrology History in Romania	Interactive lecture with video projector	2
2. Hydropheres, the Earth's surface Meteorological parameters that exert influence on the water circuit in nature, Evaporation, Condensation and sublimation, Nebulosity, Precipitation, Hydrological circuit on the globe, Local hydrological circuit, Universal hydrological circuit, Hydrological balance	Interactive lecture with video projector	4
3. General Water Properties Natural Water Form, Water Structure, Heavy Water, Physical Water Properties, Water Chemical Properties, Organoleptic Properties of Water, Biological and Microbiological Properties of Water, Surface and Groundwater Pollution, General Aspects of Water Surface water pollution, General aspects of groundwater pollution	Interactive lecture with video projector	6
4. Water role in nature and human activities Main natural water processes, Water impact in climate formation, Water contribution to relief modeling, Water importance for human activities	Interactive lecture with video projector	4
5. Potamology River Components, Hydrographic Network and Fluvial Systems, Hierarchy of Hydrographic Networks, Elements with Influence on Hydrographic Networks, River Valley Genesis, Longitudinal River Profile, River Basin	Interactive lecture with video projector	6
6. Dynamics of the rivers Action of the forces on the rivers, Laminar movement and turbulent flow of river water, Formation of currents in river water, Distribution of speeds in the river section	Interactive lecture with video projector	6
Bibliography <ol style="list-style-type: none"> <li>1. Călin Angela, Vlad Carmen, 2003, <i>Hidrobiologie și sisteme acvatice</i>, Editura Matrix Rom București.</li> <li>2. Domuța C., Brejea R., 2010, <i>Monitoringul mediului</i>, Editura Universității din Oradea.</li> <li>3. Găștescu, P., 1990, <i>Fluviile Terrei</i>, Editura Sport – Turism, București.</li> <li>4. Găștescu, P., 1998, <i>Hidrologie</i>, Editura Roza vânturilor, Târgoviște.</li> </ol>		

5. Köteles Nandor, 2010, <i>Hidrologie și hidrogeologie aplicată</i> , Editura Universității din Oradea. 6. Köteles Nandor, 2014, <i>Hidrologie</i> , Editura Universității din Oradea. 7. Pișota I., 1995, <i>Hidrologie</i> , Editura Universității București. 8. Sorocovschi V., 2002, <i>Hidrologia uscatului I-II</i> , Editura Casa cărții de știință, Cluj-Napoca. 9. Șerban, P., 1989, <i>Hidrologie dinamică</i> , Editura Tehnică, București. 10. Újvári J., 1972, <i>Geografia apelor României</i> , Editura Științifică, București. 11. Zamfirescu F., 1995, <i>Elemente de bază în dinamica apelor subterane</i> , Editura Universității București. 12. Zăvoianu, I., 1999, <i>Hidrologie</i> , Editura România de Măine, București.		
8.3 Laboratory		
1. Methods of placement of bride, Determination of water level with hydrometric blooms	Demonstration, Practical Application	2
2. Level processing. Hydrograph	Demonstration, Practical Application	2
3. Measurement of water velocities in hydrometric ribbon rivers and calculation of average speeds in survey vertices	Demonstration, Practical Application	2
4. Visiting the Oradea Hydrological Station	Demonstration, Practical Application	2
5. Measurement of water flow with hydrometric mover	Demonstration, Practical Application	2
6. Determination of water transparency with Secchi disk	Demonstration, Practical Application	2
7. Assessment of knowledge gained during laboratory classes	Demonstration, Practical Application	2
Bibliography		
1. Dalea A., Beleş Daniela, Cociuba Cornelia, 2010, <i>Hidrologie - lucrări practice -</i> , Editura Universității din Oradea. 2. Jude E., 2010, <i>Ecologie-ghid practic</i> , Editura Universității din Oradea. 3. Köteles N., 2010, <i>Hidrologie și hidrogeologie aplicată</i> , Editura Universității din Oradea. 4. Pișota I., 1995, <i>Hidrologie</i> , Editura Universității București. 5. Mănescu S., Cucu M., Diaconescu M.L., 1994, <i>Chimia sanitară a mediului</i> , Editura Medicală.		

\* The content, respectively the number of hours allocated to each course / seminar / laboratory / project will be detailed during the 14 weeks of each semester of the academic year.

**9. Corroboration of discipline content with the expectations of the epistemic community, professional associations and representative employers from the field corresponding to the study programme**

- The content of the subject is adapted and satisfies the requirements imposed by the labor market, being agreed by social partners, professional associations and employers in the field of the bachelor's program. The content of the discipline can be found in the curriculum of the Environmental Engineering specialization and other academic centers in Romania that have accredited these specializations, thus knowing the basic notions is a stringent requirement of the employers in the field of the environment.

**10. Evaluation**

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the final grade
10.4 Course	Assessment of knowledge of course content - minimum grade 5	Oral exam	80%
10.5 Seminar	-	-	-
10.6 Laboratory	Drawing up and presenting a report - minimum grade 5	Teaching laboratories and supporting them	20%
10.7 Project	-	-	-
10.8 Minimum standard of performance			
Undertaking coordinated work to solve specific problems in the field, with the correct assessment of the workload, available resources, the time required to complete and the risks under the conditions of health and safety at work.			

Date of completion

Signature of course holder\*\*

Signature of seminar  
laboratory/project holder \*\*

October 2018

Lecturer Nandor Köteles Eng., Ph.D  
kotelesnandor@yahoo.com

Lecturer Nandor Köteles Eng., Ph.D  
kotelesnandor@yahoo.com

Date of approval in the department

Signature of the Head of Department

.....

.....

Dean signature

.....

\*\* - Name, first name, academic degree and contact details (e-mail, web page, etc.) will be specified.

.....

Signature of the Head of Department\*\*\*

.....

Dean Signature\*\*\*

.....

\*\*\* - Name, first name, academic degree and contact details (e-mail, web page, etc.) of the academic entity beneficiary of the Discipline Outline will be specified.

