

## COURSE OUTLINE

### 1. GENERAL

|   |  |                     |   |
|---|--|---------------------|---|
| <b>SCHOOL</b>   | ENGINEERING                            |                     |   |
| <b>DEPARTMENT</b>   | ENVIRONMENTAL ENGINEERING              |                     |   |
| <b>LEVEL OF STUDIES</b>   | UNDERGRADUATE                          |                     |   |
| <b>COURSE CODE</b>  | ΣΤ5ΥΠ                                  | <b>SEMESTER</b>     | 3 |
| <b>COURSE TITLE</b>   | ENGINEERING HYDROLOGY                  |                     |   |
| <b>TEACHING ACTIVITIES</b><br><i>If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.</i> | <b>TEACHING HOURS PER WEEK</b>         | <b>ECTS CREDITS</b> |   |
|   | 4                                      | 5                   |   |
| <i>Please, add lines if necessary. Teaching methods and organization of the course are described in section 4.</i>  |  |                     |   |
| <b>COURSE TYPE</b><br><i>Background, General Knowledge, Scientific Area, Skill Development</i>  | BACKGROUND                             |                     |   |
| <b>PREREQUISITES:</b>   | NO                                     |                     |   |
| <b>TEACHING &amp; EXAMINATION LANGUAGE:</b>   | GREEK AND ENGLISH FOR ERASMUS STUDENTS |                     |   |
| <b>COURSE OFFERED TO ERASMUS STUDENTS:</b>  | YES                                    |                     |   |
| <b>COURSE URL:</b>  |  |                     |   |

### 2. LEARNING OUTCOMES

|  |
|--|
| <b>Learning Outcomes</b><br><i>Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.</i>  |
| A) Knowledge-based <ul style="list-style-type: none"> <li>• Student introduction to the processes included in the water cycle (rural and urban)</li> <li>• Presentation of the meteorological monitoring system (satellites, radars, weather stations) and the hydrometric monitoring system (discharge calculation)</li> <li>• Introduction to modelling (Rainfall-runoff models, flood models)</li> <li>• Performing a risk analysis in order to design several hydraulic works</li> </ul> |
| B) Skills/Competences acquired <ul style="list-style-type: none"> <li>• Capacity to assimilate the available weather data</li> <li>• Capacity to design a hydraulic work</li> <li>• Ability to use several hydrological models</li> </ul>  |
| <b>General Skills</b><br><i>Name the desirable general skills upon successful completion of the module</i>   |
| <i>Search, analysis and synthesis of data and information, ICT Use</i>   |
| <i>Adaptation to new situations</i>  |
| <i>Decision making</i>   |
| <i>Autonomous work</i>   |
| <i>Project design and management</i>   |
| <i>Equity and Inclusion</i>  |
| <i>Respect for the natural environment</i>   |
| <i>Sustainability</i>  |
| <i>Demonstration of social, professional and moral responsibility and</i>  |

|  |   |
|--|---|
| <i>Teamwork</i>                                    | <i>sensitivity to gender issues</i>                     |
| <i>Working in an international environment</i>     | <i>Critical thinking</i>                                |
| <i>Working in an interdisciplinary environment</i> | <i>Promoting free, creative and inductive reasoning</i> |
| <i>Production of new research ideas</i>            |   |

ICT use; Decision-making; Project design and management; critical thinking; autonomous work

### 3. COURSE CONTENT

This course introduces the student to the basic principles of Engineering Hydrology. The course contains lectures, examples and exercises on the main components of the water cycle, giving an emphasis to the hydraulic works design. The lectures are the following:

1. Introduction
2. Precipitation
3. Catchment characteristics
4. Hydrological losses and rainfall excess
5. Rainfall-runoff modelling of small catchments
6. Rainfall-runoff modelling of medium and large catchments
7. Flood propagation
8. Hydrological measurements
9. Statistical hydrology
10. Risk analysis for hydraulic works design
11. Urban hydrology
12. Special aspects
13. Final course

### 4. LEARNING & TEACHING METHODS - EVALUATION

| <p><b>TEACHING METHOD</b><br/><i>Face to face, Distance learning, etc.</i></p>   | Classroom lectures in using power-point overheads (uploaded in e-class) and blackboard-solved exercises. A book is distributed containing the theoretical part of the course. Personal course notes and weekly assignments are regularly updated on the e-class platform.   |                          |                          |          |    |           |    |  |  |  |  |  |  |  |
|--|---|--------------------------|--------------------------|----------|----|-----------|----|--|--|--|--|--|--|--|
| <p><b>USE OF INFORMATION &amp; COMMUNICATIONS TECHNOLOGY (ICT)</b><br/><i>Use of ICT in Teaching, in Laboratory Education, in Communication with students</i></p>  | Teaching algorithms and exercises for solving hydrological problems using Excel.  |                          |                          |          |    |           |    |  |  |  |  |  |  |  |
| <p><b>TEACHING ORGANIZATION</b><br/><i>The ways and methods of teaching are described in detail.</i><br/><i>Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research &amp; analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.</i></p> <p><i>The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards.</i></p> | <table border="1"> <thead> <tr> <th><i>Activity</i></th> <th><i>Workload/semester</i></th> </tr> </thead> <tbody> <tr> <td>Lectures</td> <td>35</td> </tr> <tr> <td>Exercises</td> <td>17</td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table> | <i>Activity</i>          | <i>Workload/semester</i> | Lectures | 35 | Exercises | 17 |  |  |  |  |  |  |  |
|  | <i>Activity</i>   | <i>Workload/semester</i> |                          |          |    |           |    |  |  |  |  |  |  |  |
|  | Lectures  | 35                       |                          |          |    |           |    |  |  |  |  |  |  |  |
|  | Exercises   | 17                       |                          |          |    |           |    |  |  |  |  |  |  |  |
|  |   |                          |                          |          |    |           |    |  |  |  |  |  |  |  |
|  |   |                          |                          |          |    |           |    |  |  |  |  |  |  |  |
|  |   |                          |                          |          |    |           |    |  |  |  |  |  |  |  |
| <p><b>STUDENT EVALUATION</b><br/><i>Description of the evaluation process</i></p> <p><i>Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report,</i></p>  | Course evaluation is based on the final written exam. The assessment Language is Greek/English (for Erasmus students) and the form of the exams is engineering problems to be solved.   |                          |                          |          |    |           |    |  |  |  |  |  |  |  |

*Clinical examination of a patient, Artistic interpretation, Other/Others*

*Please indicate all relevant information about the course assessment and how students are informed*

## 5. SUGGESTED BIBLIOGRAPHY

1. Ponce, V.M. (2014). Engineering Principles and Practices (Second Edition). online edition published in the personal webpage of the author:  
<http://ponce.sdsu.edu/enghydro/index.html>
2. Chow, V.T., Maidment, D.R., Mays, L.W. (1988). Applied Hydrology. McGraw-Hill Book Company.

## ANNEX OF THE COURSE OUTLINE

### Alternative ways of examining a course in emergency situations

|   |  |
|---|--|
| <b>Teacher (full name):</b>             |  |
| <b>Contact details:</b>                 |  |
| <b>Supervisors: (1)</b>                 |  |
| <b>Evaluation methods: (2)</b>          |  |
| <b>Implementation Instructions: (3)</b> |  |

- (1) Please write YES or NO
- (2) Note down the evaluation methods used by the teacher, e.g.
- *written assignment or/and exercises*
  - *written or oral examination with distance learning methods, provided that the integrity and reliability of the examination are ensured.*
- (3) In the **Implementation Instructions** section, the teacher notes down clear instructions to the students:
- a) in case of **written assignment and / or exercises**: the deadline (e.g. the last week of the semester), the means of submission, the grading system, the grade percentage of the assignment in the final grade and **any other necessary information**.
- b) in case of **oral examination with distance learning methods**: the instructions for conducting the examination (e.g. in groups of X people), the way of administration of the questions to be answered, the distance learning platforms to be used, the technical means for the implementation of the examination (microphone, camera, word processor, internet connection, communication platform), the hyperlinks for the examination, the duration of the exam, the grading system, the percentage of the oral exam in the final grade, the ways in which the inviolability and reliability of the exam are ensured and any other necessary information.
- c) in case of **written examination with distance learning methods**: the way of administration of the questions to be answered, the way of submitting the answers, the duration of the exam, the grading system, the percentage of the written exam of the exam in the final grade, the ways in which the integrity and reliability of the exam are ensured and any other necessary information.
- There should be an attached list with the Student Registration Numbers only of students eligible to participate in the examination.