### COURSE DESCRIPTION CARD

<table>
<thead>
<tr>
<th>Faculty of Civil Engineering and Environmental Sciences</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Field of study</strong></td>
</tr>
<tr>
<td><strong>Specialization/ diploma path</strong></td>
</tr>
<tr>
<td><strong>Course name</strong></td>
</tr>
<tr>
<td><strong>Forms and number of hours of tuition</strong></td>
</tr>
<tr>
<td><strong>Entry requirements</strong></td>
</tr>
</tbody>
</table>

**Specialization/ diploma path:**
- Municipal and industrial wastewater treatment

**Course name:** Municipal and industrial wastewater treatment

**Course code:** IS-FCEE-00039S

**Course type:** Erasmus

**Forms and number of hours of tuition:**
- L: 15
- C: 30
- LC: 30
- P: 15
- SW: 15
- FW: 15
- S: 15

**Semester:** summer

**No. of ECTS credits:** 4

**Entry requirements:**
- Water and wastewater technology, Facilities for water and wastewater treatment

**Course objectives:**
- To familiarize the student with the characteristics of industrial wastewater treatment systems and the impact of industrial wastewater on the process of wastewater treatment in municipal wastewater treatment plants. To acquaint the student with the characteristics of sewage in selected industries. Teach the student to choose the technology of equipment for industrial wastewater treatment or sub-treatment with consideration of the Best Available Technique (BAT). To familiarize the student with the operation of selected industrial wastewater treatment systems.

**Course content:**
- The lecture: Characteristics of sewage from selected industries, place of origin and unit indicators. Legal aspects related to the discharge of industrial sewage into the receiver and the municipal sewage system. Characteristics and selection of technologies and rules for sub-treatment plants and industrial sewage treatment plants. Correct operation, monitoring and case analysis.
- Project: Principles of designing a system for the treatment of industrial wastewater and its pre-treatment before it is discharged to a municipal treatment plant. The best available technology (BAT) in the treatment of wastewater from various industries.

**Teaching methods:**
- Lectures, projects, analysis of actual facilities, case studies

**Assessment method:**
- A written exam is a form of lecture credit. The condition for passing the exam is obtaining at least 50% of points. The form of passing the project is the presentation of the result of the project. The condition for passing the project is active participation in classes in which the student presents the concept and stages of its implementation.

**Symbol of learning outcome**

<table>
<thead>
<tr>
<th>Learning outcomes</th>
</tr>
</thead>
</table>

**Reference to the learning outcomes for the field of study**

---
<table>
<thead>
<tr>
<th><strong>Symbol of learning outcome</strong></th>
<th><strong>Methods of assessing the learning outcomes</strong></th>
<th><strong>Type of tuition during which the outcome is assessed</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>LO1</td>
<td>Examination for the lecture, execution and defence of the project</td>
<td>L</td>
</tr>
<tr>
<td>LO2</td>
<td>Discussion of the project, execution and defence of the project</td>
<td>P</td>
</tr>
<tr>
<td>LO3</td>
<td>Lecture completion exam, discussion of the project</td>
<td>L,P</td>
</tr>
<tr>
<td>LO4</td>
<td>Passing test of the lecture</td>
<td>L</td>
</tr>
<tr>
<td>LO5</td>
<td>Execution and defence of the project, observation of the student in class</td>
<td>P</td>
</tr>
<tr>
<td>LO6</td>
<td>Execution and defence of the project, observation of the student in class</td>
<td>L,P</td>
</tr>
</tbody>
</table>

**Student workload (in hours)**

- Participation in lectures: 15
- Participation in: auditory exercises + laboratory + design classes + specialist laboratory: 30
- Participation in consultations related to the exercise/seminar/project: 5
- Implementation of project tasks (including preparation of presentations): 45
- Preparation for and attendance at the examination/sitting: 20
- Preparation for the project credit: 10

**TOTAL:** 125

**Quantitative indicators**

<table>
<thead>
<tr>
<th>HOURS</th>
<th>No. of ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student workload – activities that require direct teacher participation</strong></td>
<td><strong>credits</strong></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Student workload – practical activities</strong></td>
<td><strong>110</strong></td>
</tr>
</tbody>
</table>

**Basic references**
- Industrial Wastewater Treatment, Recycling and Reuse, V. Bhandari, 2014

**Supplementary references**
- Constructed Wetlands for Industrial Wastewater Treatment, Alexandros I. Stefanakis (Editor), 2018

**Organisational unit conducting the course**
- Department of Environmental Engineering Technology

**Author of the programme**
- Assoc. Prof. Wojciech Dąbrowski, DSc, PhD, Eng.

**Date of issuing the programme**

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work, S – seminar