(Table 5.2) Course unit description

<table>
<tr><td colspan="5">Study program: Chemistry</td></tr>
<tr><td colspan="5">Type and level of studies: Undergraduate Academic Studies</td></tr>
<tr><td colspan="5">Course unit: Recycling</td></tr>
<tr><td colspan="5">Teacher in charge: Marina Cendic Serafinovic</td></tr>
<tr><td colspan="5">Language of instruction: English</td></tr>
<tr><td colspan="5">ECTS: 5</td></tr>
<tr><td colspan="5">Prerequisites: /</td></tr>
<tr><td colspan="5">Semester: Summer</td></tr>
<tr><td colspan="5">Course unit objective
To provide students with theoretical and practical knowledge of recycling processes and waste management, with an emphasis on chemical processes enabling the recovery and reuse of materials from waste. Students will become familiar with different types of waste, separation and processing methods, and techniques for reducing pollution and conserving resources. Students will learn how chemical technologies contribute to sustainable development and environmental protection.</td></tr>
<tr><td colspan="5">Learning outcomes of Course unit
Upon successful completion of this course, students are expected to: explain fundamental chemical processes applied in recycling and waste management; distinguish waste types based on chemical composition and properties; analyse methods of separating, processing and recycling materials; apply suitable recycling techniques depending on waste type; assess environmental impacts and economic feasibility; compare recycling technologies in terms of sustainable development; propose improvements to industrial recycling processes; and analyse the environmental and economic effects of recycling technologies.</td></tr>
<tr><td colspan="5">Course unit contents
Theoretical classes: Fundamentals of chemical processes underlying the recycling of different waste types. Students study plastics, metals, glass, paper, electronic waste and other materials, including their chemical composition and properties relevant to recycling. The course examines mechanical, chemical and biological recycling, waste separation and processing methods, including pyrolysis, hydrolysis and biodegradation. Environmental impacts, sustainable development, economic feasibility, current trends and innovations in recycling are analysed. Seminar papers help students examine practical recycling challenges and approaches to solving them.
Practical classes: None.</td></tr>
<tr><td colspan="5">Literature
1. Recycling and Sustainable Development, ISSN 1820-7480.
Supplementary
Literature:
1. L. P. Bichler, T. Koch, N. Krempl, V.-M. Archodoulaki, Rethinking PE-HD Bottle Recycling – Impacts of Reducing Design Variety, Recycling, 10 (93), 2025.
2. W. G. C. M. Senarathna et al., Paper Recycling for a Sustainable Future: Global Trends, J. Res. Technol. Eng., 4 (3), 2023, 169–186.</td></tr>
<tr><td colspan="4">Number of active teaching hours</td><td rowspan="2"></td></tr>
<tr><td>Lectures:2</td><td>Practice:0</td><td>Other forms of classes:</td><td>Independent work:</td></tr>
<tr><td colspan="5">Teaching methods</td></tr>
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Modern teaching methods (graphics, audio and video) in classrooms equipped with multimedia projectors and whiteboards. Seminar papers are based on theoretical lectures.			
Examination methods (maximum 100 points)			
Exam prerequisites	**No. of points**	**Final exam**	**No. of points**
Practical classes	10	Written examination	20
Tests	10	Oral examination	30
Homework	10	Other	
Seminars	10		
Project	10		

Grading system		
Grade	**No. of points**	**Description**
10	>= 91	Excellent
9	81-90	Exceptionally good
8	71-80	Very good
7	61-70	Good
6	51-60	Passing
5	<=50	Failing