

## SYLLABUS

### 1. Data about the program of study

1.1	Institution	The Technical University of Cluj-Napoca
1.2	Faculty	Faculty of Building Services Engineering
1.3	Department	Building Services Engineering
1.4	Field of study	Civil Engineering and Building Services
1.5	Cycle of study	Master
1.6	Program of study/Qualification	Building Services for Regenerative Cities / MS Engineer
1.7	Form of education	Full time
1.8	Subject code	6.00

### 2. Data about the subject

2.1	Subject name	Circular economy		
2.2	Course responsible/lecturer	Lect.PhD.Eng. Tania RUS - tania.rus@insta.utcluj.ro		
2.3	Teachers in charge of seminars	Lect.PhD.Eng. Tania RUS - tania.rus@insta.utcluj.ro		
2.4	Year of study	1	2.5 Semester	2
			2.6 Assessment	Colloquy
2.7	Subject category	Formative category		DS
		Optional		DI

### 3. Estimated total time

3.1	Number of hours per week	2	of which	3.2 Course	1	3.3 Seminar		3.3 Laboratory	1	3.3 Project	
3.4	Total hours in the curriculum	28	of which	3.5 Course	14	3.6 Seminar		3.6 Laboratory	14	3.6 Project	
3.7 Individual study:											
(a) Manual, lecture material and notes, bibliography										14	
(b) Supplementary study in the library, online and in the field										14	
(c) Preparation for seminars/laboratory works, homework, reports, portfolios, essays										14	
(d) Tutoring										3	
(e) Exams and tests										2	
(f) Other activities											
3.8 Total hours of individual study (sum (3.7(a)...3.7(f)))					47						
3.9 Total hours per semester (3.4+3.8)					75						
3.10 Number of credit points					3						

### 4. Pre-requisites (where appropriate)

4.1	Curriculum	Bachelor's degree
4.2	Competence	Technical competences in the field of civil engineering and building services

### 5. Requirements (where appropriate)

5.1	For the course	Classroom equipped with Video Projector - 21 December 1989 Blvd., no. 128-130
5.2	For the applications	Classroom - 21 December 1989 Blvd., no. 128-130

Laboratory	
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## 6. Specific competences

Professional competences	<p>Theoretical knowledge:</p> <ul style="list-style-type: none"> <li>- Of building services dimensioning and working principles;</li> <li>- Of building services materials and equipment used;</li> </ul> <p>Acquired skills:</p> <ul style="list-style-type: none"> <li>- To understand the need of moving from linear economy towards circular;</li> <li>- Implementation of strategies to reduce energy consumption of building services;</li> <li>- To propose solution for the building services materials and equipment reuse;</li> <li>- To identify the building services materials and equipment for upcycle or recycle.</li> </ul> <p>Skills acquired:</p> <ul style="list-style-type: none"> <li>- Reducing the consumption footprint and increasing the circular material use rate;</li> <li>- Conservation of nature reserves.</li> </ul>
Cross competences	<p>To demonstrate a creative and enterprising spirit in complex problem solving;</p> <p>Use of references in a foreign language, for professional and personal development, through continuous formation and efficient adaptation to new technical specifications.</p>

## 7. Discipline objectives (as results from the *key competences gained*)

7.1	General objective	Development of skills in the field of circularity: moving from linear, highly resource depleting systems with high emissions, waste generation, and high impacts on ecosystems, towards circular, less wasteful systems that use resources more efficiently and sustainably, while providing work opportunities and a high quality of life
7.2	Specific objectives	<p>Develop a solid understanding and integrative knowledge of circular economy;</p> <p>The ability to effectively use circularity principle in designing processes;</p> <p>To use methods and programs to transmit information.</p>

## 8. Contents

8.1. Lecture (syllabus)	Number of hours	Teaching methods	Notes
1. What is circular economy and why create circularity?	2	Video-Projector Teaching style based on the interactive teacher-student partnership;	
2. Circular economy principles for buildings	2		
3. Designing-out waste. Design for adaptability	2		
4. Design for disassembly and reuse	2		
5. Selecting materials and products	2		
6. Turning waste into a resource	2		
7. Virtuous circles. Coming full circle	2		

## Bibliography

1. European Circular Economy Stakeholder Platform - <https://circulareconomy.europa.eu/platform/>;
2. European Commission (2020) - Leading the way to a global circular economy: state of play and outlook - [https://ec.europa.eu/environment/circular-economy/pdf/leading\\_way\\_global\\_circular\\_economy.pdf](https://ec.europa.eu/environment/circular-economy/pdf/leading_way_global_circular_economy.pdf);
3. Knowledge map – circular economy (2020) - <https://kenniskaarten.hetgroenebrein.nl/en/knowledge-map-circular-economy/ce-environmental-benefits/>.

8.2. Laboratory	Number of hours	Teaching methods	Notes
1. Measuring circularity	4	Teaching style based on the interactive teacher-student partnership;	
2. Case study: Identification, limitations and critical view over the building services materials - reuse, upcycle or recycle	4		
3. Case study: Identification, limitations and critical view over building services equipment - reuse, upcycle or recycle	4		
4. Presentation of the study cases	2		

## Bibliography

1. The Circularity Gap Reporting Initiative a global score for circularity (2020) - [https://assets.website-files.com/5e185aa4d27bcf348400ed82/5e4d0a24eb0887b1ddfa59b9\\_Measuring%20and%20Mapping%20Circularity%20-%20technical%20methodology%20document.pdf](https://assets.website-files.com/5e185aa4d27bcf348400ed82/5e4d0a24eb0887b1ddfa59b9_Measuring%20and%20Mapping%20Circularity%20-%20technical%20methodology%20document.pdf);
2. European Commission (2020) - Leading the way to a global circular economy: state of play and outlook - [https://ec.europa.eu/environment/circular-economy/pdf/leading\\_way\\_global\\_circular\\_economy.pdf](https://ec.europa.eu/environment/circular-economy/pdf/leading_way_global_circular_economy.pdf);
3. Sustainability guide - <https://sustainabilityguide.eu/>.

## 9. Bridging course contents with the expectations of the representatives of the community, professional associations and employers in the field

The acquired competencies will be necessary for the employees who carry out their activity in complex interdisciplinary context for understanding the impact of their own specialty on the ecosystem and natural environment.

## 10. Evaluation

Activity type	10.1 Assessment criteria	10.2 Assessment methods	10.3 Weight in the final grade
10.4 Course	The colloquium consists in verifying the theoretical and practical knowledge acquired	Written exam	75%
10.5 Laboratory	Completion and submission of laboratory papers conditions the entrance to the exam.	Submission of laboratory papers	25%
10.6 Minimum standard of performance			
Participation in the laboratory conditions the entrance to the exam. Exam grade components (E); Laboratory (L); Calculation formula of the grade $G = 0.75 \times E + 0.25 \times L$ Condition for obtaining credits: $G > 5.0$ ; where $E > 5.0$ , $L > 5.0$			

Date of filling in:		Title Surname Name	Signature
26.06.2023	Lecturer	Lect.PhD.Eng. Tania RUS	
	Teachers in charge of application	Lect.PhD.Eng. Tania RUS	

Date of approval in the Department of Building Services Engineering	Head of department Assoc.Prof.PhD.Eng. Carmen MÂRZA
29.06.2023	
Date of approval in the Council of the Faculty of Building Services Engineering	Dean Assoc.Prof.PhD.Eng. Florin DOMNIȚA
29.06.2023	