



Marie Curie  
Innovative Training Network

PhD Training Network on  
**Durable, Reliable and Sustainable Structures**  
with **Alkali-Activated Materials**



**Course on**  
**“Durability - Sustainability and**  
**Life cycle assessment”**

***14-17 September 2020***

*Online course*

DuRSAAM – H2020-MSCA-ITN-2018-813596



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## What to expect

This is a 3-day course, formatted as a specific and interactive online training to deepen knowledge on durability, service life prediction, environmental impact, and life cycle assessment aspects. Teachers are established experts in different fields of engineering and economy, in public, but also private sector, covering specific fields of durability, life cycle assessment and circular economy. Training will therefore give insight into concrete durability-sustainability-LCA aspects, from a multidisciplinary and multisectoral perspective.

The course will be organised as a fully online course. Knowing the challenges in ensuring the same interaction in online as in classical courses, the organisation team took special effort to plan dynamic and interactive teaching, using available techniques. The course schedules half-day preparatory assignments for students, followed by online sessions with teachers. These sessions will be used for discussions, questions and answers and quizzes. In such a way, participants will be actively included in the training and knowledge transfer.

We look forward to welcome you at this course,

Prof. Marijana Serdar  
Scientific course coordinator

## Programme

### Offline preparation

<b>Day 0: Durability and special degradation mechanisms</b>	
Date:	14 September 2020
14:00 – 17:00	<b>Offline preparation for sessions 1-3</b> Literature: Book Geert De Schutter "Damage to Concrete Structures", CRC Press, 2012 <i>More specific preparation details will be provided to those subscribed.</i>

### Online course

<b>Day 1: Durability and special degradation mechanisms</b>	
Date:	15 September 2020
Location:	Virtual teaching room (Zoom platform)
8:45	<i>Virtual room will be open for test session of the online teaching environment</i>
9:00 – 9:20	<b>Session 1 – Vision 'Durability of concrete' and degradation due to inappropriate design and errors during casting</b> Prof. Stijn Matthys
9:20 – 9:30	Polling (short quiz)
9:30 – 9:45	Q&A – discussion session
9:45 – 10:00	<i>Break</i>
10:00 – 10:15	<i>'Random coffee break-out session'</i>

10:15 – 10:35	<b>Session 2 - Specific degradation mechanisms: volume stability, ASR, acid attack and freezing-thawing</b> Prof. Geert de Schutter
10:35 – 10:45	Polling (short quiz)
10:45 – 11:00	Q&A session - discussion
11:00 – 11:15	<i>Break</i>
11:15 – 11:30	<i>'Random coffee break-out session'</i>
11:30 – 11:50	<b>Session 3 - Specific degradation mechanisms: carbonation and chloride induced corrosion)</b> Assist. Prof. Marijana Serdar
11:50 – 12:00	Polling (short quiz)
12:00 – 12:15	Q&A session - discussion
12:15 – 12:30	Closing session

Offline preparation

<b>Day 1: Life cycle assessment</b>	
Date:	15 September 2020

14:00 – 17:00	<b>Offline preparation for sessions 4-6</b> Literature: Jolliet, O., Saadé-Sbeih, M., Shaked, S., Jolliet, A., & Crettaz, P. (2015). Environmental life cycle assessment CRC Press Software: SimaPro <i>More specific preparation details will be provided to those subscribed.</i>
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Online course

<b>Day 2: Life cycle assessment</b>	
Date:	16 September 2020
Location:	Virtual teaching room (Zoom platform)

8:45	<i>Virtual room will be open for test session of the online teaching environment</i>
9:00 – 9:20	<b>Session 4 - Sustainability/challenges opportunities in construction</b> Prof. Guillaume Habert
9:20 – 9:30	Polling (short quiz)
9:30 – 9:45	Q&A – discussion session
9:45 – 10:00	<i>Break</i>
10:00 – 10:15	<i>'Random coffee break-out session'</i>
10:15 – 10:35	<b>Session 5 - LCA calculation</b> Prof. Guillaume Habert
10:35 – 10:45	Polling (short quiz)
10:45 – 11:00	Q&A session - discussion
11:00 – 11:15	<i>Break</i>
11:15 – 11:30	<i>'Random coffee break-out session'</i>
11:30 – 11:50	<b>Session 6 - Practical exercise on modelling LCA</b>

	Prof. Guillaume Habert
11:50 – 12:00	Polling (short quiz)
12:00 – 12:15	Q&A session - discussion
12:15 – 12:30	Closing session

Offline preparation

<b>Day 2: Circular economy</b>	
Date:	16 September 2020

14:00 – 17:00	<p><b>Offline preparation for sessions 7-9</b> Literature: <a href="https://www.ellenmacarthurfoundation.org/publications">https://www.ellenmacarthurfoundation.org/publications</a>,</p> <ul style="list-style-type: none"> <li>• EllenMcArhur Foundation: Completing the picture, how the circular economy tackles climate change. (all reports and videos are freely available on the webpage)</li> <li>• Patrizia Ghisellini, Catia Cialani, Sergio Ulgiati (2015). A review on circular economy: the expected transition to a balanced interplay of environmental and economic systems. Journal of Cleaner Production.</li> <li>• Kate Raworth. Doughnut Economics: Seven ways to think like a 21st-century economist.</li> </ul> <p><i>More specific preparation details will be provided to those subscribed.</i></p>
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Online course

<b>Day 3: Circular economy</b>	
Date:	17 September 2020
Location:	Virtual teaching room (Zoom platform)

8:45	<i>Virtual room will be open for test session of the online teaching environment</i>
9:00 – 9:20	<b>Session 7 - Introduction to Circular Economy – what is Circular Economy and why is it a popular topic these day?</b> Dr. Birgitte Holt Andersen
9:20 – 9:30	Polling (short quiz)
9:30 – 9:45	Q&A – discussion session
9:45 – 10:00	<i>Break</i>
10:00 – 10:15	<i>'Random coffee break-out session'</i>
10:15 – 10:35	<b>Session 8 - Circular Economic modelling – what are the main barriers and challenges throughout the value circle to move from linear to circular economy? Examples from the URBCON project.</b> Dr. Birgitte Holt Andersen
10:35 – 10:45	Polling (short quiz)
10:45 – 11:00	Q&A session - discussion
11:00 – 11:15	<i>Break</i>
11:15 – 11:30	<i>'Random coffee break-out session'</i>

11:30 – 11:50	<b>Session 9 - Securing future supply of secondary raw materials (SRM) – will there be enough suitable SRMs to feed the production of geopolymers in the future?</b> Dr. Birgitte Holt Andersen
11:50 – 12:00	Polling (short quiz)
12:00 – 12:15	Q&A session - discussion
12:15 – 12:30	Closing session

## Teachers



**Prof. Marijana Serdar - University of Zagreb**  
**Scientific course coordinator**

Marijana Serdar works as Assistant Professor at the Department of Materials. Her main field of research interest is design, testing and application of more durable and sustainable construction materials and development of design approaches for more durable structures. In 2015 she received the annual award for young scientist “Vera Johanides “ from Croatian Academy of Engineering. Currently, she is managing 2 and participating in 1 project in the field of alternative binders for concrete, and is managing 1 project on development of autonomous system for assessment of structures. She is mentoring PhD students in a newly formed LATOM laboratory.



**Prof. Stijn Matthys - Ghent University**  
**DuRSAAM action coordinator**

Stijn Matthys is full professor on renovation of civil structures at Ghent University, Magnel-Vandepitte Laboratory for Structural Engineering and Building Materials, furthermore he is manager of the Ghent University [DuraBUILDMaterials](#) knowledge cluster. His expertise relates to structural renovation of civil structures, fibre reinforced polymer (FRP) reinforcement, structural behaviour of concrete structures, damage diagnostics and monitoring, and technologies for durable building materials and techniques.



**Prof. Geert De Schutter - Ghent University**

Geert De Schutter is full professor Concrete Technology and ERC Advanced Grant holder at Ghent University. He is head of the Department of Structural Engineering and Building Materials and former RILEM Director of Development. He is fellow of RILEM and ACI, and recipient of several national and international awards. His research is situated in the following domains: concrete technology, hydration and microstructure development, properties of hardening concrete, durability of cementitious materials, self-compacting concrete, rheology of cementitious materials... He is author of a few text books, including “Damage to Concrete Structures”.



**Prof. Guillaume Habert - ETH Zurich**

Guillaume Habert holds the Chair of Sustainable Construction and is associate professor at the ETH Zürich. His work focused on the development of sustainable concrete. He has lectured on sustainable construction and has taught in various engineering and architectural schools. In 2015, he was awarded the RILEM Robert L'Hermite medal for his pioneering work on LCA of concrete and recycling processes.



**Dr. Birgitte Holt Andersen - ApHER**

Birgitte Holt Andersen is heading the research and consultancy activities at CWARE and is involved in a number of research projects concerning Circular Economy, resource efficiency, resilience and sustainability of Cities. Birgitte also acts as an expert adviser to the European Commission on specific programmes of the H2020 RTD framework Programme. Birgitte is an experienced economist/PhD working in both research, industry and for the European Commission. Birgitte's main interests are circular economic modelling, emerging industries and exploitation of innovative products/services/business concepts that can help our societies in becoming more sustainable.

## Registration and books

To enrol please follow the registration procedure at this [link](#).

**The closing date for registration is August 9, 2020.**

The course is free except for the teaching material (books referenced in the programme) which will be sent to the address provided in the registration form. The cost will be announced as soon as it will be available and will be maximum of 200 EUR.

For more information, please contact Alessandro Proia ([Alessandro.Proia@ugent.be](mailto:Alessandro.Proia@ugent.be)).