

Maintenance, Repair and Strengthening

Schedule

You are all very welcomed to the course, the schedule for the three different blocks of lectures of in total 6 days given at Luleå University of Technology and on TEAMS. The course will be held on the 4-5th of December 2024 (Luleå), 22-23rd, on January 11-12th (TEAMS), and on February 2025 at Luleå University of Technology.

For participants in need of accommodation, the recommended hotel is: Luleå Stadshotell, Luleå, phone: 0920-27 40 00

Lecture block 1, Luleå University of Technology, 4-5th of December 2024. Room will be announced later

Day 1, Room: *To be announced*

Time	Subject	Speaker
10:30-11:00	Coffee (house T, SBN coffee room)	
11:00-10:15	Introduction	Sr Prof. Lennart Elfgren
11.15-12.00	Overview of the course. Why do we have to rehabilitate concrete structures?	Prof. Björn Täljsten
12:00-13.00	Lunch	
13:00-13:45	The lab and ongoing activities at LTU	Prof. Gabriel Sas
14:00-14:45	Degradation of concrete and steel	
14:45-15:15	Codes and standards	Dr. Thomas Blanksvärd
15:15-16:00	Coffee Break	
16:00-16:45	Mistakes in planning, design and construction	Dr. Thomas Blanksvärd
16:45-17:00	Short break	Prof. Björn Täljsten
17:00-17:45	Assessment procedures	
19:00-	Dinner – Probably Waldorf	

Day 2, Room: *To be announced*

Time	Subject	Speaker
08:30-09:00	Coffee (house F, SBN coffee room)	
09:00-10:00	Strengthening of concrete structures with FRP	Prof. Björn Täljsten
10.00-10.15	Short break	
10:15-11:15	Workmanship and quality control	Prof. Björn Täljsten
11:15-12:00	Repair of concrete structures	
12:00-13:00	Lunch	
13:00-14.00	Adhesive joints	Prof. Björn Täljsten
14:00-15.00	Flexure Strengthening with FRP	Prof. Björn Täljsten
15:00-15:15	Short break	
15.15-16.00	Flexure Strengthening with FRP	Prof. Björn Täljsten
	End	

Lecture block 2, Luleå University of Technology, 22-23rd of January. Room will be announced later and on TEAMS

Day 1, Room: *To be announced*

Time	Subject	Speaker
10:30-11:00	Coffee (house F, SBN coffee room)	
11:00-12:00	Flexure Strengthening with FRP	Prof. Björn Täljsten
12:00-13:00	Lunch	
13:00-13:45	Flexure Strengthening with FRP	Prof. Björn Täljsten
14:00-14:45	Shear Strengthening with FRP	Prof. Björn Täljsten
14:45-15:15	Shear Strengthening with FRP	Prof. Björn Täljsten
15:15-16:00	Coffee Break	
16:00-16:45	Shear Strengthening with FRP	Prof. Björn Täljsten
16:45-17:00	Short break	Prof. Björn Täljsten
17:00-17:45	Strengthening with FRP for fatiuge	Prof. Björn Täljsten
19:00-	Dinner – Probably Waldorf	

Day 2, Room: *To be announced*

Time	Subject	Speaker
08:30-09:00	Coffee (house F, SBN coffee room)	
09:00-10:00	Case studies of structures strengthen with FRP	Prof. Björn Täljsten
10:00-10:15	Short break	
10:15-11:15	Strengthening of columns wit FRP	Prof. Björn Täljsten
11:15-12:00	Strengthening of Columns with FRP	Prof. Björn Täljsten
12:00-13:00	Lunch	
13:00-14:00	Design examples	Prof. Björn Täljsten
14:00-15:00	Design examples	Prof. Björn Täljsten
15:00-15:15	Design examples	Prof. Björn Täljsten
15.15-16.00	Assignment	Prof. Björn Täljsten
	End	

Lecture block 3, Luleå University of Technology, 11-12th of February 2025.

Day 1, Room: *To be announced*

Time	Subject	Speaker
10:30-11:00	Coffee (house F, SBN coffee room)	
11:00-12:00	Assessment of timber structures	Prof. Björn Täljsten
12:00-13:00	Lunch	
13:00-13:45	Assessment of steel structures	Dr. Cosmin Popescu
14:00-14:45	Non-destructive testing (NDT)	Prof. Björn Täljsten
14:45-15:15	Non-destructive testing (NDT)	Prof. Björn Täljsten
15:15-16:00	Coffee Break	
16:00-16:45	Monitoring of structures	Prof. Björn Täljsten
16:45-17:00	Short break	Prof. Björn Täljsten
17:00-17:45	Monitoring of structures FRP P	Prof. Björn Täljsten
19:00-	Dinner – Probably Waldorf	

Day 2, Room: *To be announced*

Time	Subject	Speaker
08:30-09:00	Coffee (house F, SBN coffee room)	
09:00-10:00	NDT testing in lab	Dr. Cosmin. Popescu
10.00-10.15	Short break	
10:15-11:15	NDT testing in lab	Dr. Cosmin. Popescu
11:15-12:00	Evaluation of the NDT test	Dr. Cosmin. Popescu
12:00-13:00	Lunch	
13:00-14.00	Presentations of the Assignment	Students
14:00-15.00	Presentation of the Assignment	Students
15:00-15:15	Feedback	All
15.15-16.00	Spare time	Prof. Björn Täljsten
	End	

Literature

Täljsten, B., Blanksvärd, T. and Sas, G. (2016): "Kompositförstärkning av betong": Handbok", Luleå University of Technology, Division of Structural Engineering, 1st ed.

Fagerlund G. (2005): "*REHABCON*" *Strategy for maintenance and rehabilitation in concrete structures*", Work Package 2.3, Evaluation of alternative repair and upgrading methods – Final Report, pp. 299.

Swedish Concrete Association. (2013): "Vägledning för livslängdsdimensionering av betongkonstruktioner" (in Swedish), Betongföreningen, Betongrapport nr 12, 2007, pp. 141.

Dietsch P. and Köhler J. (2010) "*Assessment of Timber Structures, Report by COST Action E55 Modelling of the Performance of Timber Structures.*" Shaker Verlag, 2010, ISBN: 978-3-8322-9513-4, (online available).

Harte A. and Dietsch P (2015) "*Reinforcement of Timber Structures - A State-of-the-Art Report, COST Action FP1101*". Shaker Verlag, 2015, (online available).

Additional material in the form of journal papers and handouts will also be a part of the study material.

Assignments

Assignments will be designed dependent on the interests of the participants

Teachers:

Prof. Dr. Björn Täljsten, bjorn.taljsten@ltu.se

Dr. Cosmin Popescu, cosmin.popescu@ltu.se

Prof. Dr Gabriel Sas

Sr. Prof. Dr, Lennart Elfgren