

PhD Course in Maintenance, Repair and Strengthening of structures

Course Description

Our existing buildings and infrastructure are becoming older, in addition the demands of a structure may change over time or different deterioration processes can affect the structure negatively. All structures needs to be maintained and some needs repair or strengthening. In all this situations it is important to understand what the drivers for deterioration and what tools for repair and strengthening can be used.

In this course the student will learn the most common deterioration processes in structures, in particular for concrete structures. The student will also be thought about NDT (Non-Destructive-Testing) methods and how to repair and strengthening structures. The course will cover theoretical analysis as well as practical on hand laboratory tests (NDT). The student will also in detail learn about strengthening of structures with FRP (Fibre reinforced Polymers) – material, design and application.

The course cover also codes and standards related to rehabilitation of structures. We will cover concrete, steel and timber, with focus on concrete.

We will cover how to assess a structure (before any measure), how to maintain, repair or strengthening a structure (the measure) and how the structure should be followed up after measure. And the course will give examples of rehabilitation projects from industry.

The student will be given assignments between the meetings and at the last venue presentations of chosen assignments will be given.

The course qualifies for 7,5 study credits

When will the course be given?

The course will be given during October 2019 to March 2020. Final days has yet to be decided. The course will be given in seminar form with 3 gatherings of 2-3 days at each meeting.

Place

The venue will be held at Luleå University of Technology, 2 times, and at Chalmers University of Technology, 1 time.

Who can participate?

The course is foremost direct to PhD students in structural, material or production engineering. However, also external consultants could benefit from the course and its content.

Language

The course will be given in English

Teachers

Professor Björn Täljsten, Ltu
Associate Professor Thomas Blanksvärd, Ltu and Skanska
Associate Cosmin Popescu, Ltu and Norut Technology
Associate Professor Reza Haghani, Chalmers
Professor Robert Jockwer, Chalmers
Guest speakers

Cost

Free for PhD students and people working at universities. For external participants a fee of 18 750 SEK will be invoiced for the whole course.

Deadline

Deadline for notification is 20191115

Literature

Examples of literature are:

- Täljsten, B., Blanksvärd, T. and Sas, G. (2016): "Kompositförstärkning av betong". This book can be bought at Byggtjänst, ca 600 SEK.
- 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. (2007): "Vägledning för livslängdsdimensionering av betongkonstruktioner" (in Swedish), Betongföreningen, Betongrapport nr 12, 2007, pp. 141.
- CIRIA C595 - Strengthening Metallic Structures using Externally-bonded FRP, Stratford et al. 2004
- Rehabilitation of Metallic Civil Infrastructure Using Fiber Reinforced Polymer (FRP) Composites, edt. Karbhari
- 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, codes and standards and handouts will also be a part of the study material.

Who to contact for notification?

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