

## Materials, Systems and Structures in Civil Engineering – MSSCE 2016

In the period 15-29 August a number of doctoral course and conference segments will take place at the Technical University of Denmark under the common umbrella MSSCE 2016. The doctoral course segment described in this folder is part of this major event. MSSCE 2016 includes the following segments:

- Innovation of teaching in materials and structures
- Reliability, Safety and Value of Information
- Service life of cement-based materials and structures
- Historical masonry
- Electrochemistry in Civil Engineering
- Moisture in materials and structures
- Concrete with supplementary cementitious materials
- Frost action in concrete
- Sim. tools in the execution phase of concrete structures
- Clay and Shale
- Cold region engineering
- Building materials and indoor environment
- BIM in civil engineering

More information about MSSCE 2016 can be found at  
[www.conferencemanager.dk/MSSCE2016](http://www.conferencemanager.dk/MSSCE2016)

## Financial sponsors

The Knud Højgaard Foundation and the Larsen & Nielsen foundation are financially sponsoring this event. The aim of the foundations includes promotion of research, development and teaching within the construction area.

## RILEM Week 2016

RILEM is the international union of laboratories and experts in construction materials, systems, and structures. RILEM has the aim to promote scientific cooperation. The event described in this folder relates to the Annual RILEM Week 2016 (21-24 Aug 2016). The RILEM Week is the highlight of the RILEM calendar each year and includes meetings in many of RILEM's technical and administrative committees. More information about RILEM can be found at [www.rilem.net](http://www.rilem.net)

## Scientific sponsor

RILEM is scientific sponsor of the doctoral course segment through the RILEM Educational Activities Committee, EAC. Since its formation in 2006 RILEM EAC has sponsored about 100 high-level courses all over the world. All doctoral students registered in the course are offered a 3-year free RILEM membership.



## Materials, Systems and Structures in Civil Engineering – MSSCE 2016

### Doctoral course segment on

## Clay and shale

Lyngby, Denmark, 15-19 August 2016

## Organizers

I.L. Fabricius, Varvara Zania, Louise Belmonte

## Teachers

E. Makovsky, A Revil, R. Holt, L. Andersen,  
F. Engstrøm, N. Foged,

## Sponsored by

RILEM EAC

DTU Byg

Knud Højgaard Foundation, Denmark  
Larsen & Nielsen Foundation, Denmark



### Scope of doctoral course segment

Properties of clay and shale as substrate for construction is a field with many question marks. A lack of physical and chemical understanding of properties of these rocks is also critical in the context of sealing membranes and seals in connection with subsurface storage of heat, CO<sub>2</sub>, and hydrocarbons. Reservoir properties of shale itself is also a focus of debate. The doctoral course segment will bring you up-to-date on this important area.

### Lecture program

Date	Lecturer	Institution /Company	Course
Monday 15 <sup>th</sup> August	Prof. Emil Makovsky	University of Copenhagen	Clay mineral structure
Tuesday 16 <sup>th</sup> August	Prof. André Revil	University of Savoie, Mont Blanc	Clay physical properties
Wednesday 17 <sup>th</sup> August	Prof. Lars Vabbersgaard Andersen	University of Ålborg	Constitutive modelling of clay
Thursday 18 <sup>th</sup> August	Prof. Rune Holt	Norwegian University of Science and Technology	Shale Rock Physics & Rock Mechanics
Friday 19 <sup>th</sup> August	Prof. Niels Foged	Technical University of Denmark	Fehmarn Belt Fixed Link
Friday 19 <sup>th</sup> August	Dr. Finn Engstrøm	Mærsk Oil	Petro-physical interpretation of shales

### Course contents

The course will cover the most important topics in relation to properties of shale and clay including: Elasticity, Pore collapse, Creep, Fracturing, Pore water effects, Electrical properties.

### Work load, evaluation and certificates

The total work load is approximately 140 hours corresponding to 5 ECTS points, including the period at DTU, preparatory reading given before the course, and preparation of a poster presentation for the course. Certificates will be issued based on active participation in the entire course.

### Participants

Participants are expected to have a basic knowledge of one of the disciplines: geotechnics, petrophysics, and rock physics. Level and form of the course is aimed at doctoral students, but both final year master students and practicing engineers may also benefit from course participation. All lectures will be given in English.

### Venue and time

The general venue of the event is the Technical University of Denmark, Lyngby campus. The doctoral course segment will take place 15-19 August 2016. The course precedes the international RILEM conference, 21-24 August 2016.

### Registration, price and accommodation

The deadline for event registration is Friday, 8 July 2016 through the conference website. A course fee of EUR 250 applies for the entire course. The course fee covers participation in the doctoral course part of MSSCE 2016 and includes study material, refreshments, a barbecue and a dinner. Participants will be responsible for travel, meals, and accommodation. Pre-bookings of rooms have been made at hotels in central Copenhagen, however, participants need to make their own accommodation arrangements at these or other hotels.

### Further information

Further information about the course can be found at the home page of the general event;

<http://www.conferencemanager.dk/MSSCE2016/10-clay-and-shale-dc.html>

- or you may contact the segment responsible:

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