NRMCA Concrete Durability Course
ONLINE COURSE | JUNE 15 – 22, 2020

Course Information
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Course follows all federal anti-trust guidelines.

This course is part of NRMCA’s Seminars, Training and Education Programs, STEPS®, and earns you credit towards becoming a CCPf, a Certified Concrete Professional. The highest professional designation in the industry.

Why attend?
The course will cover the fundamental mechanisms that impact durability of concrete. Recognize symptoms and learn about methods to evaluate the deterioration of concrete; understand causes of durability problems and methods to prevent them; test methods for durability and their limitations; and code and specification criteria for durable concrete structures.
Topics will cover the concrete microstructure, cracking, corrosion mechanisms, freeze-thaw resistance, sulfate resistance, alkali aggregate reactions (AAR), and other durability-related distress.
The course will be taught by instructors who are at the forefront of current research and diagnosis of concrete durability.

Course Instructors

Michael Thomas, Ph.D., P.Eng.
Professor of Civil Engineering
University of New Brunswick
17 Dineen Drive
Fredericton, NB, E3B 5A3 (Canada)
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Kevin J. Folliard, Ph.D.
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The online course will be offered in webinar sessions and will include handout materials and review questions for each session. The sessions will be recorded for attendees who miss the live session. Course attendees will work in groups on a specification case study using ConcreteWorks software.
## ONLINE COURSE OUTLINE (Tentative – subject to change)

<table>
<thead>
<tr>
<th>Session</th>
<th>Date</th>
<th>Time</th>
<th>Topics</th>
<th>Instructor</th>
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| 1 – 2 hr| Monday June 15 | 10 a.m. – 12 p.m. EDT | Introduction  
Overview of Concrete Durability  
Nature of Concrete I:  
Hydration, microstructure & permeability | Michael Thomas |
| 2 – 2 hr| Monday June 15 | 1 p.m. – 3 p.m. EDT | Nature of Concrete II:  
Shrinkage & cracking | Kevin Folliard |
| 3 – 2 hr| Tuesday June 16 | 10 a.m. – 12 p.m. EDT | Chlorides, Carbonation & Corrosion  
Corrosion Protection | Michael Thomas |
| 4 – 2 hr| Tuesday June 16 | 1 p.m. – 3 p.m. EDT | Alkali-Aggregate Reactions | Michael Thomas |
| 5 – 2 hr| Wednesday June 17 | 10 a.m. – 12 p.m. EDT | Sulfate Attack and Related Issues | Kevin Folliard |
| 6 – 2 hr| Wednesday June 17 | 1 p.m. – 3 p.m. EDT | Overview of ConcreteWorks  
Case Study Assignment | Kevin Folliard |
| 7 – 2 hr| Thursday June 18 | 10 a.m. – 12 p.m. EDT | Code Requirements and Specifications  
Performance-based alternatives | Colin Lobo |
| 8 – 2 hr| Friday June 19  | 10 a.m. – 12 p.m. EDT | Freeze-Thaw & Deicer Salt Scaling  
Other Forms of Deterioration | Michael Thomas |
| 9 – 2 hr| Friday June 19  | 1 p.m. – 3 p.m. EDT | Group discussion on ConcreteWorks and Assignment  
Wrap up and Question and Answer Session | Kevin Folliard  
All Instructors |
| Exam   | Monday June 22 | 1 p.m. – 3 p.m. EDT |                           |                     |