



Professional Development Course for Masonry Consultants and Contractors **Design of Structural Masonry**

Course Description:

The one-day course introduces students to masonry as a structural building material. Therefore, provides information on the design and analysis of masonry structures

Course Objectives:

- Provide information on practical masonry design
- Introduce the use of Canadian Standard S304-14 Design of masonry structures
- Introduce Seismic design of masonry structures

Credit:

7 Professional Development Hours (PDH)

Who Should Attend this Course:

Civil engineers, designers, consulting engineers, architects, contractors and other parties interested to learn about the design of masonry structures.

Course based on the book:

Masonry Structures: Behaviour and Design by *Robert G Drysdale and Ahmad A Hamid*, Canadian Edition Canada Masonry Design Centre 360 Superior Boulevard • Mississauga, ON • Canada L5T 2N7 Ph: 1-888-338-3336 • Fax: 905-564-5744 • www.canadamasonrycentre.com

Course Date and Location:

Wednesday, February 21, 2018

8:30 am to 4:30 pm

SmartPark Event Centre - Located at 100-One Research Road on the SmartPark at the University of Manitoba's Fort Garry campus—Free Parking

Registration & Fees:

Fee: \$825 plus 5% GST (\$41.25) = \$866.25

Student Registration: \$425 plus 5% GST (\$21.25) = \$446.25 —Proof of student status is required, please submit to Charleen Choboter at Charleen.choboter@umanitoba.ca

Register online at: <http://simtrec.ca/event-registration/>

Refunds policy: A refund will be issued if received in writing by February 5, 2018 less a cancellation fee of \$50. No refunds will be issued after this date.

Course Schedule

8:30 am - 9:00 am	<i>Continental Breakfast</i>	
9:00 am - 9:15 am	Welcome & Introductions	Aftab Mufti
9:15 am - 10:00 am	Structural Forms	Aftab Mufti
10:00 am - 10:45 am	Philosophy of Masonry Design	Nigel Shrive
10:45 am - 11:05 am	Coffee	
11:05am - 12:00 pm	Design of Masonry Structures	Basheer Algoi
12:00 pm - 12:45 pm	Lunch	
12:45 pm - 2:10 pm	Laterally Loaded Wall (In Plane and out of Plane Loading)	Nigel Shrive
2:10 pm - 2:30 pm	Coffee	
2:30 pm - 4:30 pm	Seismic Design of Masonry Structures	Aftab Mufti, Basheer Algoi & Pooneh Maghoul

Course Contents

Structural Forms

- Walls of buildings
- Retaining walls
- Monuments
- Bridges

Philosophy of Masonry Design

- Introduction
- Cavity Walls
- Collar Jointed Walls
- Grouted Cavity Walls
- Concentrated Loads

Design of Masonry Structures

- Masonry design vs. Concrete design
- Axial Loads
- Flexural Members
- Reinforced Masonry
- Masonry Shear

Laterally Loaded Wall

- Introduction
- Design Strengths of Panels
- Edge Support Conditions and Continuity
- Limiting Dimensions
- Design Lateral Strength of Cavity Walls
- Single-Leaf Wall
- Cavity Wall
- Single-Leaf Wall with Pre-Compression
- Freestanding Walls
- Shear Strength
- Walls Containing Openings

Seismic Design of Masonry Structures

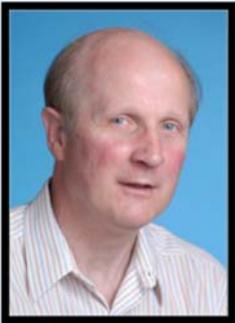
- Seismicity of Winnipeg, Manitoba and Canada
- Tripartite Diagram and Response Spectrum
- Seismic Masonry Building Design Example
- Failure modes of masonry buildings
- Elements of Lateral Load Resisting Masonry System
- Nonstructural components



Aftab A. Mufti, C.M. Ph.D., P.Eng., FRSC

Director – SIMTReC / Emeritus Professor – University of Manitoba

Dr. Aftab A. Mufti is an Emeritus Professor of Civil Engineering at the University of Manitoba, Winnipeg, Manitoba, Canada. He is also the former Scientific Director and President of the Innovative Structures with Intelligent Sensing Canada Research Network, a Network of Centres of Excellence. His research interests include FRPs, FOSs, FEM, bridge engineering, Structural Health Monitoring (SHM). At the University of Manitoba he introduced new research area of Civionics Engineering to monitor deteriorating infrastructure. He has authored or co-authored 5 books, plus provided chapters for 2 others, edited 9 books, and written more than 350 technical publications. Dr. Mufti is the recipient of 24 awards. He is the holder of several patents on the steel-free bridge deck concept, of which he is the principal developer. He has been involved in the writing of bridge design codes since 1992, and was the Chair of the Technical Sub-Committee on the Fibre Reinforced Structures of the Canadian Highway Bridge Design Code, published in 2006. Dr. Mufti has also worked on masonry walls of the Canadian Parliament Building since 2006 investigating laterally loaded clay brick masonry shear walls and study of anchoring stone cavity walls under cold temperatures, axial and lateral loads. He is a fellow of 9 societies. On November 2013 he was elected as a Fellow of the Royal Society of Canada (FRSC) and on July 1, 2010 he was appointed as a Member of the Order of Canada, highest civilian honour bestowed on Canadian citizens, for his contribution to and leadership in the field of civil engineering, notably for researching the use of advanced composite materials and fibre optic sensors in the construction and monitoring of bridges and other infrastructures.



Nigel Shrive, Ph.D.

Professor – University of Calgary

Nigel Shrive is a Professor of Civil Engineering at the University of Calgary, where he was Department head from 1989 to 1999. He teaches in the areas of structures, structural mechanics and materials. Nigel serves on the CSA S304 (Design of Masonry Structures) and A371 (Masonry Construction for Buildings) committees while chairing the CSA A179 (Mortar and Grout for Unit Masonry) committee. Dr. Shrive's research interest in masonry spans four decades, and he has made several contributions which have found their way into masonry standards. He developed the masonry design course now taught at Calgary and elsewhere by others; he recently introduced courses on the conservation of historic structures, which have some emphasis on masonry structures. Nigel works with the masonry industry both locally through the Alberta Masonry Council and nationally with the Canada Masonry Design Centre. Current research projects include slender masonry walls, adhered stone, the design of wide-spaced partially reinforced concrete blockwork and reliability assessment of old masonry structures.



Basheer Algohi, Ph.D.

Post Doctoral fellow –SIMTReC / University of Manitoba

Dr. Basheer Algohi received his Ph.D degree in Civil Engineering from King Fahad University of Petroleum and Minerals (KFUPM) in Saudi Arabia in 2013 specializing in masonry construction and design. His Ph.D. dissertation was titled “An Experimental and Numerical Study of Retrofitted Masonry Walls Under Cyclic Loading”. At KFUPM he participated in teaching several courses during his PhD study.

Dr. Algohi joined the faculty of engineering at University of Business and Technology (UBT) in Saudi Arabia where he spent six months in assistant professor position.

Dr. Algohi joined SIMTReC at the University of Manitoba in 2014. Dr. Algohi research and experience centers around three main areas. The first research experience is in the area of durability of concrete structures where Dr. Algohi studied, in his master degree, the effect of corrosion on the capacity of concrete structures. The second area of research experience is in computational modeling which includes Finite Element Method (FEM), where Dr. Algohi worked on several projects that required extensive simulation using FEM, and MeshFree method in which Dr. Algohi used this method to solve the plate bending problem. The third area of research experience is in the field of Civionic and Structural Health Monitoring (SHM). In the area of Civionic and SHM, Dr. Algohi worked extensively on several projects in which for each project Dr. Algohi installed SHM system and performed analysis and data processing. Dr. Algohi developed a software that is used for SHM system. One of the current application of this software is in BWIM and long term performance analysis of bridges.



Pooneh Magnoul, Ph.D.

Assistant Professor –University of Manitoba

Dr. Pooneh Maghoul is an Assistant Professor in the Department of Civil Engineering at the University of Manitoba. Her research interests focus on Geotechnical Earthquake Engineering, Ground Vibration and Induced Seismicity Associated with Hydraulic Fracturing and Enhanced Geothermal Systems, NonDestructive Testing Methods, Soil-Structure Interaction, Renewable Energy (Energy Geo-Structures), and Energy Efficiency of Basements. She received her M.Sc. in Soil and Rock Mechanics (2007) and her Ph.D. in Geotechnical Earthquake Engineering (2010) at Ecole des Ponts Paris Tech (Paris Institute of Technology) in France. She received postdoctoral fellowships from NSERC-

Hydro-Quebec Industrial Research Chair at Laval University (2010-2012) in Canada. Dr. Maghoul is a registered professional engineer (P. Eng.) in the provinces of Manitoba and Quebec.

For more information or questions contact:

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