

# Blast Furnace Ironmaking Course

May 12-17, 2024

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All lectures (except for Wednesday afternoon) will take place in the Michael DeGroote Centre for Learning and Discovery (MDCL), Room 1110.

## Sunday, May 12

- 17:00-21:00 REGISTRATION – MDCL southeast corner
- 18:00-19:00 Introduction to Ironmaking (optional lecture) – Jason Entwistle, U.S. Steel Corporation  
For those who have no background in high school chemistry and/or have no knowledge of the blast furnace.
- 19:00-21:00 Welcome Reception, Alumni Memorial Hall

## Monday, May 13

07:00-08:00 REGISTRATION & BREAKFAST – MDCL southeast corner

**AM SESSION** Chair: John D'Alessio, Stelco Inc.

- 08:00-08:15 Opening Remarks and Course Orientation – Keith Whitely, ArcelorMittal Dofasco and Neslihan Dogan, McMaster University/Delft University of Technology
- 08:15-09:30 Historical Development and Principles of the Iron Blast Furnace – Johan van Ikelen, van Ikelen BF consult
- 09:30-10:45 Iron-Bearing Burden Materials – Rénard Chaigneau, Baffinland Iron Mines Corp.
- 10:45-11:00 BREAK
- 11:00-12:00 Coke Production for Blast Furnace Ironmaking – Ka Wing Ng, NRCAN
- 12:00-13:15 LUNCH

**PM SESSION** Chair: John D'Alessio, Stelco Inc.

- 13:15-14:30 Blast Furnace Reactions – Bob Nightingale (Retiree), University of Wollongong and Bluescope Steel
- 14:30-14:45 BREAK
- 14:45-16:30 Blast Furnace Energy Balance and Recovery: Rules of Thumb and Other Useful Information  
Blast Furnace Computer Game Instructions – John Busser, Hatch and Mitren Sikhram, Hatch

**EVENING** Location: McMaster University Student Centre (MUSC), CIBC Hall, 3rd floor

- 19:00-22:00 Blast Furnace Computer Game – John Busser and Mitren Sikhram, Hatch

**Tuesday, May 14**

07:00-08:00 BREAKFAST

**AM SESSION** Chair: Jason Entwistle, U.S. Steel Corporation

08:00-09:15 Blast Furnace Design I – Brian Black, SMS group Americas

09:15-10:15 Casthouse Design and Blast Furnace Casthouse Optimization – Floris van Laar, Allied Minerals

10:15-10:30 BREAK

10:30-11:45 Blast Furnace Design II – Guilherme Guidugli, Primetals Technologies

11:45-13:00 LUNCH

**PM SESSION** Chair: Jason Entwistle, U.S. Steel Corporation

13:00-14:15 Blast Furnace Design III Campaign Extension – Salustiano Pinto, Consultant

14:15-15:15 Ironmaking Refractories – Floris van Laar, Allied Mineral Technical Services, Inc.

15:15-15:30 BREAK

15:30-16:30 Burden Distribution and Aerodynamics – Joseph Morey, Consultant

**EVENING** Location: McMaster University Student Centre (MUSC), CIBC Hall, 3rd floor

19:00-22:00 Blast Furnace Game – John Busser and Mitren Sikhram, Hatch

**Wednesday, May 15**

07:00-8:00 BREAKFAST

**AM SESSION** Chair: Ron Timmer, Algoma Steel Inc.

08:00-09:00 Day to Day Blast Furnace Operation – Katie McCourt, US Steel

09:00-10:15 Blast Furnace Control Measurement Data and Strategy – Bob Nightingale (Retiree), University of Wollongong and Bluescope Steel

10:15-10:30 BREAK

10:30-11:45 Challenging Blast Furnace Operations – Fred Rorick, Rorick Inc.

11:45-13:00 LUNCH - Location MUSC

**PM SESSION** Location MUSC

Chair: Ron Timmer, Algoma Steel Inc.

13:00-14:00 Fundamental Principles Applied to Blast Furnace Safety – Shawn Tilbury, ArcelorMittal Dofasco

14:00-15:00 Chilled Hearth Case Study – Sean Crawford, ArcelorMittal Dofasco, Ron Timmer, Algoma, John D'Alessio, Stelco Inc., Achinta Haldar, Stelco Inc.

15:00-15:15 BREAK

15:15-16:30 Chilled Hearth Case Study (continued)

**EVENING** Location: McMaster University Student Centre (MUSC), CIBC Hall, 3rd floor

19:00-22:00 Blast Furnace Computer Game – John Busser and Mitren Sikhram, Hatch

**Thursday, May 16**

- 07:00-08:00 BREAKFAST
- AM SESSION** Chair: Keith Whitely, ArcelorMittal Dofasco
- 08:00-09:15 Maintenance Reliability Strategies in an Ironmaking Facility – Johan van Ikelen, van Ikelen Blast Furnace Consultant
- 09:15-10:15 Fuel Injection in the Blast Furnace – Donald Zuke, Cleveland-Cliffs Inc.
- 10:15-10:30 BREAK
- 10:30-11:30 Comprehensive Numerical Modelling of the Blast Furnace Ironmaking Process – Tyamo Okoson and Samuel Nielson, Purdue University Northwest
- 11:30-12:45 LUNCH
- PM SESSION** Chair: Keith Whitely, ArcelorMittal Dofasco
- 12:45-13:45 Fundamental Principles Applied to Blast Furnace Environment – Fred Post, Algoma Steel Inc. (virtual)
- 13:45-14:45 Transitioning the Iron and Steel Industry Towards a Low-Carbon Future: Climate Change Policies and Approaches – Julie Wedzinga, Stelco Inc.
- 14:45-15:00 BREAK
- 15:00-16:00 Ironmaking/Steelmaking Interface – Mike Pomeroy, ArcelorMittal Dofasco
- 17:45 BANQUET, bus departure from MUSC to Burlington Golf & Country Club
- 19:00 DINNER

**Friday, May 17**

- 07:00-8:00 BREAKFAST
- AM SESSION** Chair: Donald Zuke, Cleveland-Cliffs Inc.
- 08:00-09:00 Ironmaking in Western Europe – Jan van der Stel, Tata Steel
- 09:00-10:00 Chinese Blast Furnace Practice – Dennis Lu, ArcelorMittal USA
- 10:00-10:15 BREAK
- 10:15-11:15 Future Trends in Ironmaking – Mitren Sukhram and Ian Cameron, Hatch
- 11:15-12:15 Overview of the DRI Process – Kevin Persad, Nucor
- 12:15-12:30 Closing Remarks
- 12:30 LUNCH
- PLANT TOURS** Pre-registration required. Bus pickup from MUSC.
- 12:30-16:30 Stelco Lake Erie Works tour with boxed lunch for bus
- 13:00-16:30 ArcelorMittal Dofasco tour