

An Intensive Short Course on Design, Simulation and Troubleshooting of Bulk Solids Handling Systems

**Pneumatic Conveying
Storage: Hopper/Silo/Bin
Simulation (DEM Application)
User Problems/Troubleshooting**

*Mining & Minerals/Thermal Power/Cement/
Food/Chemical/Pharmaceutical Industries*

**India International Centre
40, Max Mueller Marg, New Delhi-110003**

February 15-16, 2018



Organized by: Department of Mechanical Engineering



COURSE OBJECTIVES

Industries that rely on bulk materials handling, such as power, cement, mining and minerals, steel, chemical, petrochemical, food and grains, pharmaceutical etc. are facing challenges of increasing capacity while meeting new product/process and reliability requirements in a sustainable manner. This in-depth course aims at providing up-to-date and comprehensive training for the design and operation of storage and conveying of bulk solids systems. It covers:

- Application of characterization of bulk solids
- Flow properties of bulk solids: shear testing and stresses induced in bulk solids: design of hoppers and silos
- Quality control, segregation, handling of bulk solids
- Feeder interfacing, flow obstructions, promotion
- Pneumatic conveying: flow modes, pressure drop, blockage prediction, scale-up, layout, components
- Simulation/modelling of storage and transport processes using Discrete Element Method (DEM): design/improvements - silo, feeder, wear, conveyor transfer
- Modelling, application and troubleshooting, industry case studies and user problems

WHO SHOULD ATTEND?

This course is aimed at all practicing engineers, operators, engineering managers, equipment and system suppliers, consultants, designers and those who need a better understanding of the practical and technical issues involved with the reliable and safe handling, storage and conveying of powders and granular bulk materials. Both newcomers and experts in industry will benefit from this course.

WHY YOU SHOULD ATTEND?

- Discover how to minimise commodity loss and increase throughput.
- Hear industry best-practice and up-to-date research on improving system design, analysis and upgrade
- Take away practical information for the application of new strategies on bulk handling development and improvement based on the direction of industry.
- This forum doesn't shy away from bringing new technologies forward so that engineers can see what opportunities exist.

COURSE PRESENTERS



Dr. Peter Wypych (Professor) is the Director of International Solids Handling Research Institute, University of Wollongong, Australia. He has been involved with bulk handling, conveying and dust control since 1981 and has published over 500 articles in these areas. He also has run numerous training and design courses around Australia and overseas. He is the Founder and General Manager of BME Australia and has completed over 460 industrial projects for industry all around the world. He is a Fellow of Engineers Australia and the Chair of Australian Society for Bulk Solids Handling.



Dr. S.S. Mallick (Associate Professor) has developed the Laboratory for Particle and Bulk Solids Technologies at Thapar University. Dr. Mallick has published about 50 research papers in international journals and conferences. He has been the Principal Investigator for designing and troubleshooting projects for various industries. He holds a PhD from University of Wollongong, Australia in bulk solids handling.

NUMBER OF SEATS

Limited seats - maximum 30 delegates can be registered.

REGISTRATION FEES

REGULAR: Rs. 12,500 per person on or before 15.01.2018

LATE: Rs. 15,000 per person after 15.01.2018

INTERNATIONAL FEES: USD 400/500 (regular/late)

Fee includes: course notes, tea/coffee, lunch, course dinner.

Fees does not include accommodation charges.

GROUP DISCOUNT: 20% discount for each delegate for more than 1 delegate coming from same organization/invoice. 30% discount for each delegate for more than 3 delegates coming from same organization/invoice.

CANCELLATION: Registration fee is not returnable once paid. If you are unable to attend the event, a substitute delegate is welcome at no extra charge. Organisers reserve the right to alter/cancel the course due to unforeseen circumstances. A full refund of fees will be made in that case.

DETAILED PROGRAM FOR SHORT COURSE

Day 1: February 15, 2018

- 9.00-9.20: Registration and welcome address
9.20-10.50: Characterization of bulk solids, application to design of systems and components
10.50-11.10: Morning tea
11.10-12.40: Flow types in hoppers/silos, flow properties, shear testing, stresses in bulk solids, design of silo/hopper
12.40-13.20: Lunch
13.20-14.50: Silo flowability problems- arching, rathole, segregation, flooding, flow promotion, feeder interfacing, case-studies
14.50-15.10: Afternoon tea
15.10-16.40: Pneumatic conveying modes, standard test-design procedure, pneumatic conveying characteristics
16.40-17.00: Evening tea
17.00-18.30: Modelling/scale-up of pressure drop, straight pipe and models, blockage boundary, design of step-up pipe
18.30-19.30: Hands-On Tutorial/Assignment 1: Pneumatic conveying system design for step-up pipes
19.30-20:30: Hands-On Tutorial/Assignment 2: Silo design

Day 2: February 16, 2018

- 9.00-9.20: Review of day 1 and tutorial solutions
9.20-10.50: Feeder selection in pneumatic conveying: blow tanks, rotary valves, flow optimization, air leakage
10.50-11.10: Morning tea
11.10-12.40: Selection of compressors, fans, bag filters for pneumatic conveying, instrumentation, case studies
12.40-13.20: Lunch
13.20-14.50: Discrete Element Method (DEM) based simulation: modelling/design & improvements, case studies: flow in hopper/silo, feeder loads, wear, conveyor transfer
14.50-15.10: Afternoon tea
15.10-16.40: Co-simulation technology for design: DEM-CFD coupled & DEM-multi-body dynamics for equipment design
16.40-17.00: Evening tea
17.00-20.00: User problems/troubleshooting session
20.00-21.00: Course dinner

USER PROBLEMS/TROUBLESHOOTING

A Problem-Solving session (3 hrs) will be held at the end of second day to investigate and solve as many user problems as possible. Delegates are encouraged to bring their specific problems in the plant (with data, schematic etc.)

HANDS-ON TUTORIAL ASSIGNMENTS

The delegates will be provided Hands-On Tutorial Assignments 1 and 2 at the end of Day 1 (2 hrs) on the design of step-up pneumatic conveying pipeline (estimation of pipeline diameter, pressure drop and optimum air flow) and mass flow silo. The delegates are expected to complete the assignments within the 2 hrs period using laptops. All the delegates are advised to bring their own laptops (fully charged) with MS-EXCEL installed to carry out assignments.

BULK SOLIDS RESEARCH GROUP @TU

The Bulk Solids Research group at Thapar University (TU) is a vibrant team of faculty, staff and students actively involved in applied research on pneumatic conveying, flow properties of powders, silo/hopper design, powder application in power, mining, pharmaceutical industries etc. The group has developed research laboratory for bulk solids handling and providing solutions to industry needs and having MoU with UoW, Australia. The Mechanical Engineering Department was established in 1956 with the inception of the Institute. Engineering Program of the department is accredited with ABET (USA). TU holds partnership with TCD, Dublin on various academic fronts.

SPONSORSHIP OPPORTUNITIES

Two categories : Either (a) course dinner or (b) lunch for both days. Sponsors will have banner, advertising material/product display, one free registration and opportunity to address the delegates. Contact Dr. S.S. Mallick for details.

COURSE INFORMATION

All queries related to the course are to be addressed to:

Dr. S.S. Mallick, Associate Professor (Coordinator)

Department of Mechanical Engineering

Thapar University, Patiala, Punjab-147004, India

(M): +91 9592697176, Email: ssmallick@thapar.edu

Co-coordinators: Dr. A. Mittal, Dr. G. Setia, Mr. A. Sharma

DETAILS OF PAYMENT

BANK TRANSFER PAYMENT

Please make payment to the following account:

Name of Beneficiary: THAPAR UNIVERSITY

A/C No: 02630020000237

Type of A/C: Saving

IFSC : KKBK0000263

Swift Code : KKBKINBB

Bank Name and Address:

Kotak Mahindra Bank Ltd.

Leela Bhawan, Patiala, Punjab, India

REGISTRATION FORM

Fill up the following bank transfer details and email to Dr. S.S. Mallick at ssmallick@thapar.edu after payment:

Name(s) of delegates:

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Name of organization:

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Transaction/Journal No:

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Dated:

Amount (Rs.):

Bank Name.....

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Branch.....

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