

# Surface Engineering

## Overview

Thermal Spray is means of depositing a superior coating material having desired properties over a relatively in-expensive base material (substrate).The applied coating improves the life of treated components without affecting its mechanical properties. All thermal spray processes have three steps in common; feed coating material (in form of wire, powder and rod), heat that material to semi-molten stage, and transfer the material by force of gas or compressed air to the part being coated.

The objective of this course is to introduce thermal spray technology for protecting surfaces for industrial applications such as gas turbines, IC engines (automobiles), boilers and several other engineering components. An interactive session based on real life case studies will illustrate the potential of thermal spray coatings. The course will help improvise the understanding of participants on thermal spray processes.

## Course Participants will Learn

- To describe various surface coating technologies and their applications in industry
- To apply measurement techniques and carry out characterization of industrial coated surfaces
- To describe standard methods of testing of modified surfaces

Course participants will learn these topics through lectures and interactive sessions. Also case studies and assignments will be shared to stimulate research motivation of participants.

<b>Modules</b>	<ul style="list-style-type: none"><li>• Duration:- One week (6 days), Start date: June 23, 2016, End Date: June 28, 2016</li><li>• Total Contact Hours: 30 hours: 4 hours lectures/day, 1 hour tutorial/day, over 1-week</li></ul>
<b>Course Outline</b>	<ul style="list-style-type: none"><li>• Introduction to Thermal Spray processing: about surface engineering, classification of thermal spray processes</li><li>• Processing and design: cleaning &amp; bonding processes</li><li>• Materials in thermal spray, type of coatings, design of coatings</li><li>• Applications for thermal spray coatings</li></ul>
<b>You Should Attend If...</b>	<ul style="list-style-type: none"><li>• You are an executive, engineer, technician and researcher from manufacturing, service, government organizations including R&amp;D laboratories</li><li>• You are a student, at all levels (BTech/MSc/MTech/PhD)</li><li>• You are a faculty from academic institutions</li></ul>
<b>Fees</b>	<p><b>Registration Fees</b></p> <p>The participation fees for taking the course is as follows:</p> <ul style="list-style-type: none"><li>• Participants from abroad: US \$500</li><li>• Industry/ Research Organizations: Rs. 30000/-</li><li>• Academic Institutions: Rs. 10000/-</li></ul> <p>The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr free internet facility. The participants will be provided with accommodation on payment basis.</p>

# The Faculty



**Prof. Christopher C. Berndt** graduated in 1977 with a BAppSc. in Metallurgy, from what is now called the University of South Australia. His PhD was earned in the Materials Engineering Department of Monash University in mid-1981. His higher doctorate, DEng, was awarded in 2014. He moved to Swinburne University of Technology in late 2007 as the founding Professor of Surface Science and Interface Engineering. He was elevated to University Distinguished Professor in March 2014. He undertook several Fellowships in the USA in the early 1980's; which included a 2 year stint at NASA-Lewis Research Center in Cleveland (OH-USA) where he worked on aerospace hardware. Berndt's professional interests gravitate around manufacturing; especially in the area of protective coatings. He was inducted into the Thermal Spray Hall of Fame in 2007. He was the President of Thermal Spray Society (an affiliate of ASM International) in 2002 through to 2004. He was appointed as a Trustee (the Board of Directors) of ASM Int. (aka "the American Society of Materials") for 2005-2008. Berndt became the Vice-President of ASM Int. and progressed to President in October 2011. Berndt was also the President of the Australian Ceramic Society from mid-2008 through to mid-2010. Berndt has in excess of 500 publications. He is the Editor/Co-editor of 10 conference proceedings on thermal spray. Berndt has an 'h-index' of 48 and more than 7,900 citations to his work.



**Dr. Harpreet Singh** is currently working as an Associate Professor in School of Mechanical, Materials and Energy Engineering at Indian Institute of Technology Ropar, India. He has been doing extensive research work in several areas related to materials and manufacturing since the year of 2002. His areas of interest include Surface Engineering-Degradation of Materials, High Temperature Corrosion and its Protection, Slurry Erosion of Hydraulic Turbines and its Control, Biomedical Coatings; and Friction-Stir Processing/Welding. He has done pioneering work to explore the use of cold spraying to develop erosion-corrosion resistant coatings. He has authored one monograph titled, "Plasma Spray Coatings for Superalloys" and contributed more than one-hundred fifty papers in various international/national journals and conferences. He is a recipient of "Kansai Nerolac Excellence Award for the Excellence in Coating Research", "Young Scientist Award", "Career Award for Young Teachers (CAYT)" and "Maharashtra State National Award for the Research Work done by the Teachers of Engineering Colleges-2007" by Society for Surface Protective Coatings (India), Punjab Academy of Sciences, AICTE and ISTE respectively.

## Course Co-ordinator

### Harpreet Singh Ph.D.

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