GLOBAL INITIATIVE OF ACADEMIC NETWORKS (GIAN)

Course # 171003L17

Welding Metallurgy and Weldability of Non-Ferrous Alloys

11.12.2017 – 15.12.2017 (01:00 PM to 04:00 PM)

Mechanical Sciences Block (MSB), Room # 360, IIT Madras

Overview

The course elucidates the metallurgical response of various non-ferrous alloy systems to fusion welding. For each of the alloy systems, a convenient classification scheme will be presented along with a brief description of the properties and the industrial use of different classes of alloys. The physical metallurgy and then the welding metallurgy of the various alloy systems will be comprehensively reviewed. The main problems in fusion welding of these alloy systems will be examined and some guidelines for successful welding, including filler selection and post-weld heat treatment, will be provided. The mechanical properties and the service performance of the welded joints in different alloy systems will also be discussed. Furthermore, advances in modeling of welding phenomena, as well as, extension of welding knowledge to emerging additive manufacturing will also be discussed.

Who should attend?

- Students of bachelor's, master's, and doctoral programs interested in understanding welding metallurgy and weldability of non-ferrous alloys.
- Faculty members engaged in teaching and research aiming to advance their understanding of welding metallurgy and weldability of non-ferrous alloys.
- Engineers in public and private sector companies and researchers in national laboratories and other R&D institutions seeking expert knowledge in welding metallurgy and weldability of non-ferrous alloys.

Course fee

Category	Amount[#]
Students	Rs. 2000
Faculty members	Rs. 6000
Engineers/Researchers	Rs. 10000
International participants	USD 300

[#]*Inclusive of 18% GST*

Instructions for paying the course fee are provided at the end. Participants are required to first register on GIAN portal by paying a one-time fee of Rs. 500. For more details, visit http://www.gian.iitkgp.ac.in/GREGN/index

Participation in this course is limited and is on FCFS basis. ***The last date for course registration is 10.11.2017.***

Accommodation

Subject to availability, participants may be provided hostel accommodation in IIT Madras on payment basis. Interested participants may request for hostel accommodation through http://hosteldine.iitm.ac.in/iitmhostel

Faculty

Prof. Sudarsanam Suresh Babu
University of Tennessee, Knoxville

Prof. Suresh Babu holds a Ph.D. in Materials Science and Metallurgy from University of Cambridge. He is currently UT/ORNL Chair of Advanced Manufacturing at the University of Tennessee, Knoxville. In this role, he acts as a bridge between UTK and ORNL's expertise and infrastructure at Manufacturing Demonstration Facility to develop collaborative research and education ecosystem locally and deploy engineering solutions to manufacturing industries. Prof. Suresh Babu has more than two decades of research experience in welding, additive manufacturing, and computational materials modeling. He is a Fellow of ASM International, a Fellow of American Welding Society, and a Fellow of American Association for the Advancement of Science.

Dr. G.D. Janaki Ram, IIT Madras

Dr. G.D. Janaki Ram obtained his Ph.D. in Metallurgical and Materials Engineering from IIT Madras. From 1998 to 2005, he served as a Scientist in Regional Centre for Military Airworthiness (Materials). In 2005, he went to Utah State University, USA, for his post-doctoral work in additive manufacturing. In 2008, he returned to India to begin a faculty position at IIT Madras. Since then, Dr. Janaki Ram has been actively engaged in teaching and research in the fields of welding and additive manufacturing.

Lecture schedule & contents

Day 1: Principles of Welding Metallurgy (Prof. Suresh Babu)

Overview of thermal, metallurgical, and mechanical phenomena in welding, understanding weldability, introduction to modeling of welding phenomena, in-situ and ex-situ characterization, application of modeling tools to welding, extension of welding knowledge to additive manufacturing

Day 2: Welding Metallurgy of Nickel and Cobalt Alloys (Prof. Suresh Babu)

Physical metallurgy, alloy systems, weldability issues, structure-property problems, strategies for successful welding, case studies

Day 3: Welding Metallurgy of Titanium and Aluminum Alloys (Prof. Suresh Babu)

Physical metallurgy, alloy systems, weldability issues, structure-property problems, strategies for successful welding, case studies

Day 4: Welding Metallurgy of Magnesium Alloys (Dr. Janaki Ram)

Introduction to magnesium alloys, physical metallurgy, weldability issues, structure-property problems, strategies for successful welding

Day 5: Welding Metallurgy of Copper Alloys (Dr. Janaki Ram)

Introduction to copper alloys, physical metallurgy, weldability issues, structure-property problems, strategies for successful welding

Course Coordinator

Dr. G.D. Janaki Ram
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Instructions for course fee payment

- The course fee may be paid by online bank transfer to the account of Centre for Continuing Education (CCE) at IIT Madras given below. Please fill the Payment Intimation Form and email to the Course Coordinator by 18.11.2017.

Account Name	:	CCE IIT Madras
Account Number	:	36401111110
Bank Name	:	State Bank of India (SBI), IIT Madras Branch, Chennai
SWIFT Code	:	SBININBB453
Bank IFSC Code	:	SBIN0001055
TAN Number	:	CHE304464F
PAN Number	:	AAAAI3615G
GST Number	:	AAAAI3615GSD001

- Alternatively, the course fee may be paid by demand draft (DD) drawn in favor of "CCE IIT Madras" payable at Chennai. Please mail the DD along with the Payment Intimation Form to the Course Coordinator so as to reach by 18.11.2017.
- IIT Madras is exempted under section 10(23c) (iii ab) of the Income Tax Act and as such no tax has to be deducted at source.
- Course fee receipts will be provided by CCE, IIT Madras.

Payment Intimation Form
Course title: Welding Metallurgy and Weldability of Non-Ferrous Alloys
Course # 171003L17
Payment type (Individual/Group):
Fee category (Student/Faculty/Engineer/Researcher/International):
Participant's name(s):
Address, email, phone:
By bank transfer **Bank's name, branch, place:** **UTR/Transaction #** **Date of transaction:** **Amount transferred:**
By DD **Amount:** **DD #** **Date:** **Bank's name, branch, place:**