

Green Material Forming and Joining

Overview

The development of manufacturing processes and materials cannot happen without taking into account the sustainability and green issues. Some of the approaches towards sustainable and green manufacturing are, Enhanced use of renewable energy, Establishment of green buildings, Reduction of specific consumption of energy and water and materials, Reduction in specific emissions of wastes, effluents, Maximize recycling of wastes and water etc. The best example for this is the growing tie-up between Steel makers and vehicle manufacturers through Ultralight Steel Automotive Body (ULSAB) concept aiming to reduce the carbon footprint throughout the lifecycle of the vehicle. Several technologies like development of high strength steels, novel joining techniques like Friction Stir Welding, Laser Welding, Forming techniques like Hot Forming, Incremental forming, and Extrusion have been developed. In this course, the concept of green and sustainability issues towards efficient material forming and joining will be highlighted.

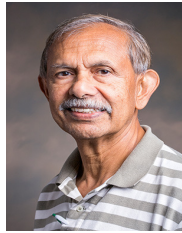
The main objectives of the course are, Exposing the participants to the basics of green material forming and joining technologies, Realizing the relationship between conventional processes and the green forming and joining processes, Providing case studies for green forming and joining processes, Providing workouts for converting conventional processes to green processes, and Highlighting the importance of awareness on Green manufacturing through education. The course includes green and sustainability concepts in material forming like bulk forming and sheet forming emphasising hot forming, material development, lubrication, minimizing defects etc. In the case of joining, newly developed joining processes and process efficiency improvement will be highlighted. Die design and material selection towards green and sustainability will be presented. 3D manufacturing and micro/nano forming will be discussed. Finally the impact of curriculum modification at UG and PG level for creating awareness about green and sustainability concepts will be discussed.

The DETAILED course content will be uploaded at: http://www.iitg.ernet.in/engfac/ganu/public_html/

Course participants will learn these topics mainly through lectures and case studies.

Course duration	June 6, 2016 to June 11, 2016; 1 Credit course covering 12 lecture hours (2 hours/day) Number of participants for the course will be about fifty.
Who can attend	<ul style="list-style-type: none">• Executives, engineers and researchers from mechanical, production, metallurgy, manufacturing, service and government departments & organizations including R&D laboratories.• Student at all levels (BTech/MSc/MTech/PhD) or Faculty from reputed academic institutions and technical institutions.
Course fees	The participation fees for registering the course is as follows: Student Participants: Rs. 1000/- (refundable) Participants from abroad: US \$500 Industry/ Research Organizations: INR 30000/- Academic Institutions: INR 10000/- The above fee include all instructional materials, computer use for tutorials and assignments (if any), laboratory equipment usage charges, 24 hr free internet facility. The participants will be provided with accommodation on payment basis.

The Faculty



Prof. Jay Gunasekera is a senior professor at Ohio University, USA. Prof. Jay is an internationally recognized researcher in the area of metal forming and manufacturing. He has contributed a lot in the fields of Advanced materials processing, CAD/CAM of dies, Design and Computations of manufacturing processes, Ring Rolling, Precision Forging and Extrusion, Micro-Forming. He is a foundation Magnet School Professor (formerly Champion Professor in Forging) of the FIA (Forging Industry Association), Fellow of the SME (Society of Manufacturing Engineers) and a Fellow of the Institution of Mechanical Engineers, UK. Dr. Gunasekera has advised several graduate students, who are now leaders in their respective fields. Dr. Gunasekera has published several technical publications in refereed journals and conferences. He was in the editorial committee of Journal of Material Processing Technology, ASM Journal of Materials Engineering and Performance, & ASM Journal of Materials Shaping Technology.

Visit <http://www.ent.ohiou.edu/~gseker/> for details



Dr. R. Ganesh Narayanan is currently Associate Professor at the Department of Mechanical Engineering at Indian Institute of Technology Guwahati, India. His areas of research include Material forming and Joining. He has contributed mainly in the areas of Forming of sheet materials including laser welded, friction stir welded sheets & adhesive bonded sheets, computational applications in material forming and joining, and end forming of tubes. He has published several articles in reputed journals and books.

Visit http://www.iitg.ernet.in/engfac/ganu/public_html/ for details

Course Co-ordinator

Dr. R. Ganesh Narayanan

Phone: 0361-258 2669

E-mail: ganu@iitg.ernet.in

http://www.iitg.ernet.in/engfac/ganu/public_html/

www.gjan.iitkgp.ac.in/GREGN/