

INTRODUCTION

The world is moving towards E-Mobility. Battery powered cars would give out no emissions whatsoever, would be much lighter, more easily manoeuvrable and controllable. Fossil fuels will not last too long. E-Mobility is the need of the time necessitated mainly by environmental issues.

For the economical and efficient production of an electric car, it is absolutely necessary to have low weight of body in white, the power train, aerodynamic, aesthetic design and high energy density storage in batteries. Design for manufacturing in BIW as well as the power train carried out mainly by finite element based simulation and Innovation in sheet metal forming processes (material, tooling and processes) play very important role in future car development.

New innovations in sheet metal forming have largely aimed at reducing weight of body in white and at the same time fulfill all crash requirements. Present course will also give an overview of innovations in sheet metal forming mainly in the areas of materials, processes and tooling.

Challenges of E-Mobility is demanding in terms of high power and energy density storage in batteries, fast charging, better management of heat generated and higher mileage per charge. Till a battery operated car reaches its peak development, and infrastructure necessary for that is developed, a hybrid engine concept is seen as an intermediate solution. Such a hybrid engine would have an IC engine as well as a battery drive. Hence it is absolutely essential to think of light weighting an IC Engine. This programme focusses on current and future battery technology and hybrid engine concepts.

BROAD OBJECTIVES

The primary objectives of the course are as follows:

- Providing exposure to design for manufacturing of lightweight engine and powertrain elements by demonstrating solutions to these problems through simulation tools.
- Highlighting new state of the art manufacturing innovations in sheet metal forming

Appreciate the future role of E-Mobility powered by Li-Ion batteries and hybrid engines..

COURSE CONTENTS

The course will be delivered in 2 parts, the first two days will focus on innovations (of immediate relevance to automotive industry) in sheet metal forming, including those at IIT Bombay. The next three days will be on Electric cars, which are of relevance for the future. The innovations relevant to cars will generally be discussed in this program.

- The program will have **lectures and tutorials** which will give **hands on experience** to the participants with regard to solving problems and performing calculations.
- The course will primarily cover over the first two days, formability concepts and innovations in sheet metal forming. Here, a new index of formability, namely, the Strain Non-uniformity Index (SNI) will be introduced, and its application to industrial automotive components will be discussed. The SNI based failure prediction software developed will be demonstrated. Following this, ideas and efforts towards light weighting of automobiles, including light weighting of IC Engine and powertrain components, relevant to the immediate future will be discussed. Developments in raw materials and processes in the manufacture of BIW parts will be brought out. Feasibility of adoption of these innovative developments by the Indian industry will be of interest to all.
- Thereafter, design methodology when designing an Electric car (calculations for arriving at the resistance to motion of a car, energy needed to move a car at various speeds), battery specifications, and different types of batteries, battery construction and issues with batteries of various kinds, will be covered. Fuel cells as a source of power will also be briefly discussed.
- Finally, the future of e-mobility in India will be explored.

WHO MAY BENEFIT

Press Shop professionals, especially those working in the automotive sector will benefit the most from the course.

Since light weighting is a common theme across all sectors using sheet metal, Press shop professionals can take away ideas on light weighting irrespective of the sector they might be coming from.

E-mobility is seen worldwide as the future of the automotive industry. An understanding of the issues in adopting Electric cars to the Indian roads will be a significant takeaway from the programme.

VENUE FOR CLASSES

Course will be held at the Room no. 31, 3rd Floor Victor Menezes Convention Centre, IIT Bombay.

LECTURE NOTES

To fully realize the objectives of the course, the lecture notes/slides will be made available to the participants at the time of registration at IIT Bombay.

FACULTY

The lectures will be delivered by Prof. P. P. Date, Mechanical Engineering Department, IIT Bombay and Dr-Ing. K. D. Jamadar, Planer, Digitale Karosseriebauplanung, Volkswagen Aktiengesellschaft, Germany.

ACCOMMODATION

Accommodation on twin sharing basis is available in the Institute Guest house for a limited number of participants on payment basis and with an advance request. Information on off campus accommodation is available [please click here](#).

IMPORTANT DATES

Last date for receipt of registration form: September 29, 2017

Course dates: October 03 – 07, 2017

Note:

- Incomplete application forms will not be entertained.
- For additional copies of the registration form, please use a photocopy or type in the format given.

REGISTRATION

Per participant

- First Two days only (Innovations in Sheet Metal Forming) : Rs. 11800 inclusive 18% GST per head
- Next three days only (E-Mobility) : Rs. 17700/- inclusive 18% GST per head
- Full program (All five days) : Rs. 25960/- inclusive 18% GST per head, for more than one participant from a single organisation : Rs. 23600 /- inclusive 18% GST per head.
- For Delegates from Academia and Government institutions course fees will be Rs. 21240/- inclusive 18% GST for the entire programme.
- The course fees for Doctoral students (limited seats only) will be Rs. 17700/- inclusive 18% GST for the entire programme.

Course fees will not be refunded. A number of delegates from a single organisation attending partially will have to pay separately and individually as per the rates given above. That is, one person attending only on one day and another only on the second day will be treated as two separate delegates and will have to pay accordingly.

The demand draft should be drawn in favour of “**The Registrar, IIT Bombay-CEP Account**” payable at Mumbai.

No income tax is to be deducted at source from the course fee, as IIT Bombay is exempt from the same. The course fee includes course material, lunch and coffee/tea.

A Certificate of participation will be awarded to all the participants of the course.

Completed registration forms should be sent to the course coordinator at the following address:

Prof. Prashant P. Date

Department of Mechanical Engineering,

Indian Institute of Technology Bombay,

Powai, Mumbai – 400 076.

Phone : (022) –25767511

Fax : (022) – 25726875

Email : ppdate@gmail.com

On-line Payment Transaction Details

Bank details will be provided on request for payment amount exceeding Rs. 25,000/- Only

Please email the above details to: cep@iitb.ac.in



REGISTRATION FORM

Five-day CEP Course on
**E-Mobility and Innovations in Sheet Metal
Forming**

October 03 - 07, 2017

CEP Short Term Course on

E-Mobility and Innovations in Sheet Metal Forming

October 3 - 7, 2017

Coordinator

Prof. Prashant P. Date
Department of Mechanical Engineering

Office of
Continuing Education & Quality Improvement Programmes

Indian Institute of Technology Bombay
Powai, Mumbai – 400 076

NAME (BLOCK LETTERS) : _____

Gender: M / F

DESIGNATION : _____

ORGANIZATION: _____

MAILING ADDRESS : _____

TELEPHONE : _____ (O) _____ (R)

FAX: _____ MOBILE: _____

EMAIL : _____

QUALIFICATIONS : _____ EXPERIENCE : _____ Yrs.

IIT Guest House accommodation required?* YES / NO

PAYMENT: D.D. No.: _____ Dt. _____ Rs. _____

[Demand draft should be drawn in favour of "Registrar, IIT Bombay (CEP A/c)"].

Date:

Signature of Applicant

***Guest House bill to be paid directly by participant.**
(PHOTOCOPY ADDITIONAL COPIES OF THIS FORM, IF NEEDED)