INTRODUCTION

The world is moving towards E-Mobility. Battery powered cars would give out no emissions whatsoever, would be much lighter, more easily manoeuverable 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 lightweighting an IC Engine. This programme focusses on Battery Manufacture, battery technology and hybrid engine concepts.

BROAD OBJECTIVES

The primary objectives of the course are as follows:

- Appreciate the future role of E-Mobility powered by Li-Ion batteries and hybrid engines, electric hardware for E-Mobility
- Exposure to design and manufacture of Batteries and lightweight hardware (like engine and powertrain elements)
- Highlighting new state of the art manufacturing innovations in sheet metal forming

COURSE CONTENTS

1. The first day will focus on innovations (of immediate relevance to hybrid vehicles) in sheet metal forming, including those at IIT Bombay. The remaining programme will be on Electric cars.
2. The program will have lectures and tutorials which will give hands on experience to the participants with regard to solving problems and performing calculations.
3. Laboratory visits for half a day are also planned.
4. The course will primarily cover on the first day, Applications of an innovative index of formability, namely, the Strain Non-uniformity Index (SNI) to industrial automotive components will be discussed. The SNI based failure prediction software developed will be demonstrated. Following this, ideas and efforts towards lightweighting of automobiles, including lightweighting of IC Engine and powertrain components (in hybrid vehicles), relevant to the immediate future will be discussed. Feasibility of adoption of these innovative developments by the Indian industry will be of interest to all.
5. Thereafter, different varieties of electric vehicles, their configurations, 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, different types of batteries, battery construction and issues with batteries of various kinds, motors, control elements, their construction, will be covered. Fuel cells as a source of power will also be briefly discussed.
6. Manufacture of a battery for E-Mobility will be demonstrated using clay models.

WHO MAY BENEFIT

Professionals, working in the automotive sector will benefit the most from the course. 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. Electrical hardware (like motors, batteries, control systems, generators) manufacturers will benefit from the program.

VENUE OF THE PROGRAMME

Course will be held at the Vanvihar seminar hall, Vanvihar Guest House, IIT, Bombay

FACULTY

The lectures will be delivered by Prof. P. P. Date, Mechanical Engineering Department, IIT Bombay and Prof B. G. Fernandes, Department of Electrical Engg, IIT Bombay and Dr-Ing. K. D. Jamadar, Planer, DigitaleKarosseriebauplanung, 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 : July 15, 2018

Course dates : July 16 – 20, 2018
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

- Industry Delegates: Rs. 23600 [including 18% GST] per head; for more than one participant from a single organisation: Rs. 22000 [including 18% GST] per head. Discounts do not apply to Spot Registrations.
- For Delegates from Academia and Government institutions course fees will be Rs. 17700/- [including 18% GST] for the entire programme.
- The course fees for students (Full Time) will be Rs. 11800 [including 18% GST] for the entire programme.
- Spot Registrations: Rs. 25000/- [including 18% GST] per head

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.

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.

The participants should register for the course and pay the respective course fees online at the following URL

https://portal.iitb.ac.in/ceqipapp/

Only online registration is accepted for this course.

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