

**SPEAKERS**



**Dr. Rui Chen**  
Professor,  
Loughborough University, UK.



**Mr. N. V. Marathe**  
Sr. Dy. Director,  
Powertrain Engineering, ARAI, Pune.



**Mr. Ramesh Pasarija**  
Dy. Director,  
SAE India western Section, Pune.



**Dr. S. S. Ramdasi**  
General Manager,  
Powertrain Engineering, ARAI, Pune.



**Dr. Shimachalam Juttu**  
Dy. General Manager,  
Powertrain Engineering, ARAI, Pune.



**Mr. H. J. Gayen**  
Dy. General Manager,  
Powertrain Engineering, ARAI, Pune.



**Mr. K. P. Wani**  
Manager,  
ARAI Academy, ARAI, Pune.



**Mr. Ashwin Subramanian**  
Manager,  
Powertrain Engineering, ARAI, Pune.



**Mr. Ashish Jain**  
Manager,  
Powertrain Engineering, ARAI, Pune.



**Dr. Brijesh Patel**  
Dy. Manager,  
ARAI Academy, ARAI, Pune.



**Mr. Aatmesh Jain**  
Engineer,  
ARAI Academy, ARAI, Pune.

Also Speakers from ARAI & Other Industry are expected.



5 Day Proficiency Improvement Programme on  
**POWERTRAIN ENGINEERING**  
10<sup>th</sup> to 14<sup>th</sup> July 2017 at ARAI, Kothrud, Pune

**REGISTRATION FORM**

Name, Designation, Dept., Office No., Mobile No. & Email ID :	
Delegate - 1	
Delegate - 2	
Delegate - 3	
Company Name & Address	
Co-ordinator's Name, Designation, Contact No., Email ID	
100% Advance Payment Details	

Please fax/email/post duly filled-in registration form on or before 7<sup>th</sup> July 2017 to:

Dr. K. C. Vora, Sr. Dy. Director & Head, ARAI Academy  
ARAI Post Box 832, Pune 411004 / S. No. 102, Vetil Hill, Off Paud Road, Kothrud, Pune 411038  
Tel: 020-3023 1248/ 1245 /1111, Fax: 020-3023 1104  
Email: [training.pga@araiindia.com](mailto:training.pga@araiindia.com); [morgaonkar.pga@araiindia.com](mailto:morgaonkar.pga@araiindia.com); [patil.pga@araiindia.com](mailto:patil.pga@araiindia.com)



2015



2011

5 Day Proficiency Improvement Programme on  
**POWERTRAIN ENGINEERING**



at

**ARAI, Kothrud, Pune**  
(The Automotive Research Association of India)

**10<sup>th</sup> to 14<sup>th</sup> July 2017**

Jointly Organized by



## BACKGROUND & OBJECTIVES

The aim of this module is to elaborate on the principles of the thermodynamics and combustion engines and improve understanding in the construction, design, technology and performance parameters of Automotive Powertrain. This will be set in the wider context of the Powertrain within the vehicle–customer system.

## INTENDED LEARNING OUTCOMES

On completion of the module, the delegates should be able to:

- Describe the powertrain performance and manufacturing parameters.
- Match the characteristics of the customer, the vehicle, and the powertrain.
- Describe the combustion process and the emission from the major engine types.
- Be well prepared to complete the later module on Engine Performance and Design.
- Apply critical awareness in the solution of automotive powertrain problems.
- Use informed judgment to analyze and interpret powertrain data and when necessary, design experiments to gain new data.
- Demonstrate compressive understanding of advanced techniques applicable to designing a powertrain system. Lead multi-disciplinary teams.
- Demonstrate independent learning ability necessary for conducting professional development.
- Become self-disciplined self-motivated, demonstrating personal responsibility in the pursuit of studies and professional practice.



ARAI

## PROGRAMME

### Day One

- 08.30 - Registration
- 9.30 - Introduction to ARAI & Loughborough University
- 10.00 - Overview of Automotive & Powertrain Engineering
- 11.00 - Modern SI Engine Technologies – GDI
- 13.00 - Lunch
- 14.00 - Modern SI Engine Technologies – Downsize
- 15.30 - Engine Characteristics

### Day Two

- 9.00 - Diesel Engine Combustion
- 10.30 - Modern CI Engine Technologies
- 12.00 - Engine Mechanics Fundamentals
- 13.00 - Lunch
- 14.00 - Technology Roadmap
- 15.30 - Turbocharging of Diesel Engine

### Day Three

- 09.00 - • Practical Demo on Swirl Measurement  
• Practical Demo on Emission Measurement on Genset/Tractor Engine
- 11.00 - Advanced Fuel Efficiency and Combustion Technologies
- 13.00 - Lunch
- 14.00 - Advanced Fuel Efficiency and Combustion Technologies (Contd.)
- 15.00 - Common Rail Direct Injection

### Day Four

- 09.00 - Filtration (Air, Fuel, Oil)
- 10.30 - Engine Friction & Lubrication
- 13.00 - Lunch
- 14.00 - Advanced Valvetrain

### Day Five

- 09.00 - Transmission Engineering
- 10.30 - Design of Automotive Transmission - Gears
- 13.00 - Lunch
- 14.00 - Written Test
- 15.00 - Summary, Discussions and Feedback
- 16.00 - Certificate Distribution

**Note :** ARAI reserves the right to change the dates, schedule, contents, speakers, venue etc. for the programme without any notice.

## WHO SHOULD ATTEND ?

- Organizations involved in Engine R&D and Testing
- Vehicle Manufacturers
- Engine Manufacturers
- Engine Manufacturing, Assembly & Service Engineers
- Engine related Component Manufacturers
- Engineering /Consulting Companies
- Professors / Engineering Students
- Engineers who are interested in pursuing further studies on part time / full time basis

## MODE OF PAYMENT

At Par / Multicity cheque or demand draft in favour of

**The Automotive Research Association of India**  
payable at Pune.

**ARAI**, over five decades, has provided its design and development expertise to the Indian automotive industry, focusing on the testing and evaluation of components and systems to meet national and international standards. ARAI strives to achieve international recognition in these areas. In keeping with the globalization of economy and business, ARAI continues to enlarge its scope of services to meet the requirements of automotive industries around the world. In addition to utilizing state-of-the-art technology, laboratories and highly-trained personnel, ARAI recognizes the need to develop a new generation of engineers to meet the demands of the automotive industry, not just in India but across the globe.

**ARAI ACADEMY** is classified into three divisions:

**LEARNING CENTRE** has embarked upon a programme of building up human resources by commencing educational programme (Graduate, Post graduate & Doctoral) with specialization in Automotive Engineering. It has tied up with VIT University (Vellore), Veltech University (Chennai), College of Engineering (Pune), Christ University (Bangalore), University of Alabama (USA), Tennessee Tech University (USA), Loughborough University (UK) and University of Braunschweig (Germany).

**KNOWLEDGE CENTRE** It has collection of around 23,000 books, standards, project reports, seminar/conference proceedings and around 75,000 SAE technical papers. It also has 237 eBooks. It subscribes to 40 national and international journals. It regularly publishes a monthly magazine 'Automotive Abstracts'. It also conducts literature / patent search for customer's projects.

**TRAINING CENTRE:** In line with Post Graduate and Doctoral Programs conducted by various universities abroad, ARAI Academy has devised various Proficiency Improvement Programmes (PIPs), to be taught by ARAI, Academia & Industry Experts. PIP gives engineers, faculty and student's knowledge and technical expertise in a wide range of automotive disciplines. It helps in understanding system's view point for

## REGISTRATION FEES

Category	Registration Fees (Rs.) (per participant)
Engineers & Professionals	25,000.00
Teaching Faculty	15,000.00
Engineering College Students	10,000.00

Besides the Registration fees, there would be applicable taxes thereon (Service Tax / GST as the case may be). It is anticipated that the taxes will be payable @ 18% which will be further confirmed at time of registration

**Registration fees include:**

- Breakfast
- Lunch
- Delegate Kit

automotive design and manufacture, with specific skills in formulating automotive engineering solutions in terms of their function and performance, through optional modules. Based on the present system in universities, credits are proposed for each module, so that the graduate engineers can attend various modules and sum-up the credits required for Master's or Doctoral Programs. Participants also get chance to visit related laboratories of ARAI and get hands on experience. Certificates are issued on the basis of attendance & written test conducted at the end of the programme. We also conduct Training Programmes through WEBEX and Domain Training Programmes for Automotive Industry.

Please visit [www.araiindia.com](http://www.araiindia.com) for more information.

**Loughborough** is a fantastic place to study and work, boasting unrivalled sporting achievement, internationally acclaimed research and outstanding teaching quality – attributes that helped to secure unbeaten 6 times winner of 'Queen's Annual Awards' and the prestigious Sunday Times '2008/2009 University of the Year' award.

In its centenary years, Loughborough prides itself on the high quality of its educational provision and the supportive learning environment it offers to students. The success of graduates in securing employment with the UK's top recruiters is further evidence of the exceptional standard of teaching at the University.

The Automotive Engineering Department is a specialist centre within one of the largest faculties of engineering in UK. It is located in modern, purpose-built premises with excellent laboratories and equipment that include a fully anechoic chamber, a large-section wind tunnel and a vehicle simulator. Today it is an internationally acclaimed centre of research excellence and plays a leading role in the development of new knowledge and understanding across all its field of activity.

Please visit [www.lboro.ac.uk](http://www.lboro.ac.uk) for more information.