

TRAINING CENTRE

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 which has completed 15 years on 10 May 2019, is a Skill Development initiative of ARAI. It is classified into three divisions, viz Learning Centre, Training Centre and Knowledge Centre. 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 SRM (Chennai), KARE (Krishnankoil), College of Engineering (Pune), Christ (Bengaluru), Cummins College of Engineering for Women (Pune), Savitribai Phule Pune University (Pune), Chitkara University, (Chandigarh), MIT World Peace University, (Pune), RIT, Sangli and other Universities in India & abroad.

Training Centre has devised various Proficiency Improvement Programmes (PIPs). It gives engineers, faculty and students knowledge and technical expertise in a wide range of automotive disciplines. It helps in understanding systems view point for automotive design and manufacture, with specific skills in formulating automotive engineering solution in terms of their function and performance, through optional modules. Domain Training Programmes (DTPs), where training is imparted at Customer's site are also becoming more popular. Academy is developing high quality e-learning modules called "ePIPs" on various Automobile Engineering subjects. These highly interactive e-Modules hosted on ARAI's own Learning Management System (LMS) <https://elearning.araiindia.com/> help users access these courses anytime & anywhere. With this, ARAI Academy has become global with 360 blended training approach.

PROFICIENCY IMPROVEMENT PROGRAMMES (PIPs)

TITLE OF THE COURSE	DATE	DURATION	VENUE	PROPOSED PARTNER/S
Real Driving Emissions (Blended)	15 th - 16 th July 21	06 hrs	Online	
EMC in Electric Vehicles	19 th – 20 th July 21	06 hrs	Online	
EV Battery Performance and Ageing Characteristics (virtual approach)	22 nd – 23 rd July 21	06 hrs	Online	Gamma Tech
Simulation & Optimization of Thermal Management of xEV	29 th – 30 th July 21	06 hrs	Online	
Road Safety Awareness Programs - Inaugural	30 th July 21	01	Online	MoRTH, ACMA, ASDC, SIAM & AICTE
Hybrid Electric Vehicles (Blended)	3 rd – 5 th Aug 21	09 hrs	Online	
Design & Analysis of ATV using Ansys Software	6 th – 7 th Aug 21	08 hrs	Online	ANSYS, ARK
Light Weight Material for Automotive Application	10 th – 11 th Aug 21	06 hrs	Online	
SCR for BS-VI Applications (Blended)	13 th Aug 21	04 hrs	Online	
Battery Diagnostic Software & IoT for EV	17 th – 19 th Aug 21	09 hrs	Online	IESA
Conference on Fuel Cell Technology	17 th – 19 th Aug 21	10 hrs	Online	
Vision Zero	20 th Aug 21	03 hrs	Online	MoRTH, ACMA, ASDC, SIAM & AICTE, Volvo
Alternative Fuel	24 – 26 th Aug 21	09 hrs	Online	
Brake System Design & Safe T	26 th - 27 th Aug 21	06 hrs	Online	MoRTH, ACMA, ASDC, SIAM & AICTE
Electric Motor Performance Characteristics using CAE	30 th – 31 st Aug 21	06 hrs	Online	

Battery Management System of Electric Vehicle	1 st - 3 rd Sept 21	06 hrs	Online	
Road Safety Awareness Programs	06 th Sep 21	01	Online	MoRTH, ACMA, ASDC, SIAM & AICTE
Engine Emission & Control (blended)	07 th – 09 th Sep 21	09 hrs	Online	
Bharat NCAP	13 th Sept 21	01	Online	MoRTH, ACMA, ASDC, SIAM & AICTE
Engine Electronics & Management System (Blended)	14 th – 15 th Sep 21	6 hrs	Online	
FMEA & DVP	16 th – 17 th Sept 21	06 hrs	Online	
Computer Vision for ADAS Systems	21 st - 23 rd Sep 21	09 hrs	Online	AkAr
Road Safety Awareness Programs	24 th Sept 21	01	Online	MoRTH, ACMA, ASDC, SIAM & AICTE
Alternative & Advanced Battery Technologies for EV	5 th – 7 th Oct 21	09 hrs	Online	IESA
Latest Trends in After Treatment Systems (blended)	7 th – 8 th Oct 21	06 hrs	Online	
Bus & Coach Fire Safety	12 th Oct 21	01	Online	MoRTH, ACMA, ASDC, SIAM & AICTE
Advance Automotive Engineering (FDP)	20 th – 22 nd Oct 21	09 hrs	Online	
Road Safety Awareness Programs	25 th Oct 21	01	Online	MoRTH, ACMA, ASDC, SIAM & AICTE
Conference on E-Mobility & Charging Infrastructure	26 th – 28 th Oct 21	06 hrs	Online	
Particulate Filter (Blended)	29 th Oct 21	04 hrs	Online	
Automotive NVH	09 th – 11 th Nov 21	09 hrs	Online	
EV & Thermal Management	17 th – 18 th Nov 21	06 hrs	Online	
Pedestrian Safety	22 nd Nov 21	01	Online	MoRTH, ACMA, ASDC, SIAM & AICTE
Electric Vehicles: Development, Validation & Certification	23 rd – 25 th Nov 21	09 hrs	Online	
Engine Simulation	29 th – 30 th Nov 21	06 hrs	Online	
Emission Type Approval (including BS-VI) (Blended)	1 st – 3 rd Dec 21	09 hrs	Online	
Tyres	6 th Dec 21	02	Online	MoRTH, ACMA, ASDC, SIAM & AICTE
Reliability Engineering (Blended)	8 th - 9 th Dec 21	04 hrs	Online	
Vehicle Dynamics & Control	14 th – 16 th Dec 21	09 hrs	Online	AkAr
Road Safety Awareness Programs	17 th Dec 21	01	Online	MoRTH, ACMA, ASDC, SIAM & AICTE
Automotive Aerodynamics	28 th – 29 th Dec 21	06 hrs	Online	
Automotive Testing & Certification	4 th -6 th Jan 22	09 hrs	Online	
Automotive Propulsion including EV Motors	12 th – 13 th Jan 22	06 hrs	Online	
National Road Safety Month Awareness Programs	14 th Jan 22	01	Online	MoRTH, ACMA, ASDC, SIAM & AICTE
Real Driving Emissions (Blended)	18 th – 19 th Jan 22	06 hrs	Online	
Child Safety	20 th – 21 st Jan 22	02	Online	MoRTH, ACMA, ASDC, SIAM & AICTE
Automotive Design & Styling	24 th - 25 th Jan 22	06 hrs	Online	
EV Performance Characteristics & Simulation	27 th -28 th Jan 22	06 hrs	Online	
Automotive Lighting	1 st – 2 nd Feb 22	02	Online	MoRTH, ACMA, ASDC, SIAM & AICTE
National Road Safety Month Awareness Programs	4 th Feb 22	01	Online	MoRTH, ACMA, ASDC, SIAM & AICTE
Hydrogen: future of the fuel (Blended)	8 th – 9 th Feb 22	06 hrs	Online	
Vehicle Energy Ecosystem	10 th – 11 th Feb 22	06 hrs	Online	

Global eMobility Overview, future challenges & Opportunities	15 th – 17 th Feb 22	09 hrs	Online	IESA
Off Road Vehicles (specialization in tractor)	23 rd - 24 th Feb 22	06 hrs	Online	
National Road Safety Month Awareness Programs	25 th Feb 22	01	Online	MoRTH, ACMA, ASDC, SIAM & AICTE
Automotive Safety	1 st – 2 nd Mar 22	06 hrs	Online	
Electric Vehicles Batteries and Energy Storage Systems	8 th – 10 th Mar 22	09 hrs	Online	IESA
Advance technology in 2W and 3W	17 th – 18 th Mar 22	06 hrs	Online	
PROFICIENCY IMPROVEMENT PROGRAMMES (PIPs) TO BE PLANNED				
Automotive Manufacturing	To be decided	02	ARAI FID	
Thermodynamic Simulation for Powertrain	To be decided	06 hrs	Online	AVL
Vehicle Crashworthiness and Occupant Protection using CAE	To be decided	06 hrs	Online	
Professional Development of Drivers	To be decided	01	ARAI FID	
Noise Pollution Control	To be decided	01	Online	
Virtual Testing for Robust Calibration	To be decided	02	Online	
In-Vehicle Infotainment	To be decided		Online	APTIV
Automotive Protocols	To be decided		Online	
Clean Energy and Clean Powertrain Technologies-an India Perspective	To be decided		Online	
Automotive Foundry Technology	To be decided	12 hrs	Online	ASM, Pune
Engine Design & Development	To be decided	09 hrs	Online	
Electric Vehicle Charging Infrastructure & Battery Swapping	To be decided	09 hrs	Online	IESA
Automotive Power Electronics (Motor Control)	To be decided	09 hrs	Online	
Automotive Materials & Characterization	To be decided	12 hrs	Online	ASM, Pune
Advances in Plastic Moulding	To be decided	05 hrs	Online	
INTERNSHIP PROGRAMMES				
Hybrid Electric Vehicle (xEV)	1 st July – 2 nd Sept 21	One month	Online	
Advanced Automotive Technology (AAT) and Analysis Led Design (ALD)	1 st Sept – 3 rd Dec 21	Three months	Online	
Automotive Test Engineer Qualification Pack (QP)				
• Module 1: Foundation Course	20 th Sept – 01 st Oct 21	10	ARAI FID	ASDC
• Module 2: Engine Level Testing	13 th – 17 th Dec 21	05		
• Module 3: Component Level Testing	07 th – 11 th Feb 22	05		
• Module 4: Vehicles Level Testing	14 th – 18 th Mar 22	05		
• Final Assessment	25 th - 29 th Apr 22	05		
EV Test Engineer Qualification Pack (QP)				
• Module 1: Foundation Course	20 th Sept – 01 st Oct 21	10	ARAI FID	ASDC
• Module 2: EV Powertrain Testing & Certification	13 th – 17 th Dec 21	05		
• Module 3: Indoor Testing of EV	07 th – 11 th Feb 22	05		

• Module 4: Outdoor Testing of Vehicle and Charging	14 th – 18 th Mar 22	05		
• Final Assessment	25 th - 29 th Apr 22	05		
DOMAIN TRAINING PROGRAMMES (DTPs)				
Engine Design & Development	BSVI Regulations			
Engine Testing & Certification	Design, Validation & Failure Analysis of IC Engine			
Automotive / Vehicle Testing & Certification	DFMEA / DVP&R			
Automotive Engineering	Heat Treatment			
Fundamentals of Automotive Electricals and Electronics	Testing of Seating Systems			
Engine Performance & Troubleshooting	Automatic Transmission			
Welding Technology and Defects Analysis	AMT Technology			
Drive Train System & Diagnosis	EV / HEV Technology			
New Automotive Technology	Engine Technology			
e-PROFICIENCY IMPROVEMENT PROGRAMMES (ePIPs)				
Reliability Engineering	Anytime	Course access- 60 days Course time – 5 hrs.	Anywhere (Internet based)	
Engine Electronics and Management System (EEMS)	Anytime	Course access–60 days Course time – 15 hrs.	Anywhere (Internet based)	RBEI
Fuel Cell Technology	Anytime	Course access- 60 days Course time – 2 hrs.	Anywhere (Internet based)	
Real Driving Emission	Anytime	Course access- 60 days Course time – 5 hrs.	Anywhere (Internet based)	
Emission Type Approval (BS-VI) : 2,3,4 Wheeler Vehicles	Anytime	Course access- 60 days Course time – 2 hrs. each	Anywhere (Internet based)	
Combustion in IC Engines	Anytime	Course access- 60 days Course time – 1.5 hrs.	Anywhere (Internet based)	
Selective Catalytic Reduction (SCR)	Anytime	Course access- 60 days Course time – 2 hrs.	Anywhere (Internet based)	

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

For further information & registration of Training Programmes, please contact Mr. Rajesh Patil, Dy. General Manager, ARAI Academy at +91 2135-630790 /91/ 95 or +91 2135-396690/91/95 or email: patil.pga@araiindia.com; training.pga@araiindia.com;

For more details, proposals & partnership please contact:

Dr. K. C. Vora, Sr. Dy. Director & Head, ARAI Academy at vora.pga@araiindia.com

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Websites: www.araiindia.com & <https://academy.araiindia.com>

E-Learning Online Courses (e-PIPs)

Highlights

- ✓ Latest and up-to-date content
- ✓ Highly interactive, engaging and effective
- ✓ Real-life industry examples
- ✓ Hands-on practice in virtual environment
- ✓ Pre and Post assessments to assess learner's knowledge
- ✓ Certificate on passing the Final Assessment

Benefits:

- ✓ All online courses are flexible in nature i.e. 24 x 7 operational
- ✓ Easy to monitor learner's activity to know their course current status
- ✓ Very engaging which improves learner's knowledge absorption and retention
- ✓ Revisit topics instantly and at your own pace
- ✓ Certificate which help learner's for their career advancement

Reliability Engineering



Course Content:

- Introduction to Reliability Engineering (Including Bathtub Curve, Failure Rate Behavior)
- Reliability Statistics and Distributions
- Life Data Analysis (Using Minitab software)
- Warranty Data Analysis
- Reliability Block Diagrams
- Reliability Testing Methods (ALT, HALT, HASS, ESS, etc.)
- Sample Size in Reliability Testing

Course Seat time: 5 hours

Course Validity: 60 days

Course Cost (INR)*	Students	2500	Corporate (Individual company sponsored)	7000
	Faculty	4000	Corporate Bulk (15 Licenses - 1 year validity)	50000

Engine Electronics & Management Systems (EEMS)



Course Content:

- Fundamentals of Automotive Electronics
- ECU, Microcontrollers and Memories
- Sensors & Actuators
- Automotive Control Systems
- Engine Management System
- Calibration and Diagnostics
- Standards

Course Seat time: 15 hours

Course Validity: 60 days

Course Cost (INR)*	Students	7500	Corporate (Individual company sponsored)	20000
	Faculty	12500	Corporate Bulk (15 Licenses - 1 year validity)	150000

* All prices are excluding GST

Fuel Cell Technology



Course Content:

- Basic Introduction of Fuel Cells
- Structure and Working of Fuel Cells
- Classification, Advantages & Applications
- Performance and Associated Losses in Fuel Cells
- Thermodynamic Analysis of Fuel Cells
- PEMFC Design Challenges
- Hydrogen Production, Storage & Handling

Course Seat time: 2 hours

Course Validity: 60 days

Course Cost (INR)*	Students	1000	Corporate (Individual company sponsored)	3000
	Faculty	1600	Corporate Bulk (15 Licenses - 1 year validity)	20000

Real Driving Emissions



Course Content:

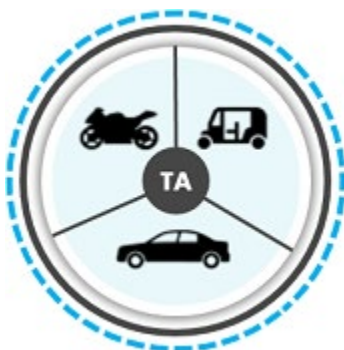
- Introduction to RDE
- RDE adoption in Europe
- Equipment required for RDE
- PEMS
- RDE Testing Methodology for LDV Applications
- RDE Testing Variables
- EU-RDE and I-RDE Boundary Conditions
- Steps for RDE test
- Trip Dynamics and Post Processing

Course Seat time: 5 hours

Course Validity: 60 days

Course Cost (INR)*	Students	2500	Corporate (Individual company sponsored)	7000
	Faculty	4000	Corporate Bulk (15 Licenses - 1 year validity)	50000

Emission Type Approval (including BS-VI): 2, 3, 4 Wheeled Vehicles



Course Content:

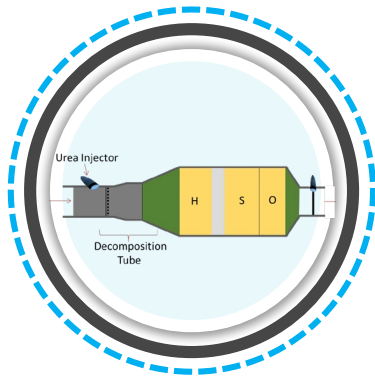
- Overview of Type Approval test as per BS-IV & BS-VI norms
- Applicability of Test Requirements for Type-Approval
- Differences between BS-IV and BS-VI legislative limits
- Test setup for mass emission test
- Applicable test cycles for various categories of vehicles
- Importance of Deterioration Factor

Course Seat time: 2 hours each

Course Validity: 60 days

Each Course Cost (INR)*	Students	1000	Corporate (Individual company sponsored)	4000
	Faculty	2000	Corporate Bulk (15 Licenses - 1 year validity)	30000

Selective Catalytic Reduction (SCR)



Course Content:

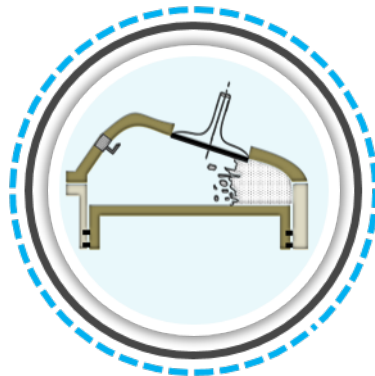
- NO_x Formation in Engines
- Fundamental, Effects of NO_x Emission
- NO_x Reduction Techniques
- Fundamental of SCR Technique
- Various Catalysts & their Operating Temperature Window
- SCR Reducing Agents or Diesel Exhaust Fluid (DEF)
- SCR Operation & System Components
- Ammonia Generation from Urea
- Reaction Mechanism
- Urea Dosing & Injection System
- Urea Spray Interaction
- SCR Regeneration

Course Seat time: 2 hours

Course Validity: 60 days

Course Cost (INR)*	Students	1000	Corporate (Individual company sponsored)	4000
	Faculty	2000	Corporate Bulk (15 Licenses - 1 year validity)	30000

Combustion in IC Engines



Course Content:

- Fundamental of Combustion Process
- Combustion Chemical Reactions
- Otto Cycle
- Gasoline Combustion Process
- Stages of Gasoline Combustion
- Knocking
- Diesel Cycle
- Stages of Diesel Combustion
- Combustion Characteristics Curves & Analysis
- Advanced Combustion Concepts

Course Seat time: 1.5 hours

Course Validity: 60 days

Course Cost (INR)*	Students	750	Corporate (Individual company sponsored)	3000
	Faculty	1500	Corporate Bulk (15 Licenses - 1 year validity)	22500

* All prices are excluding GST