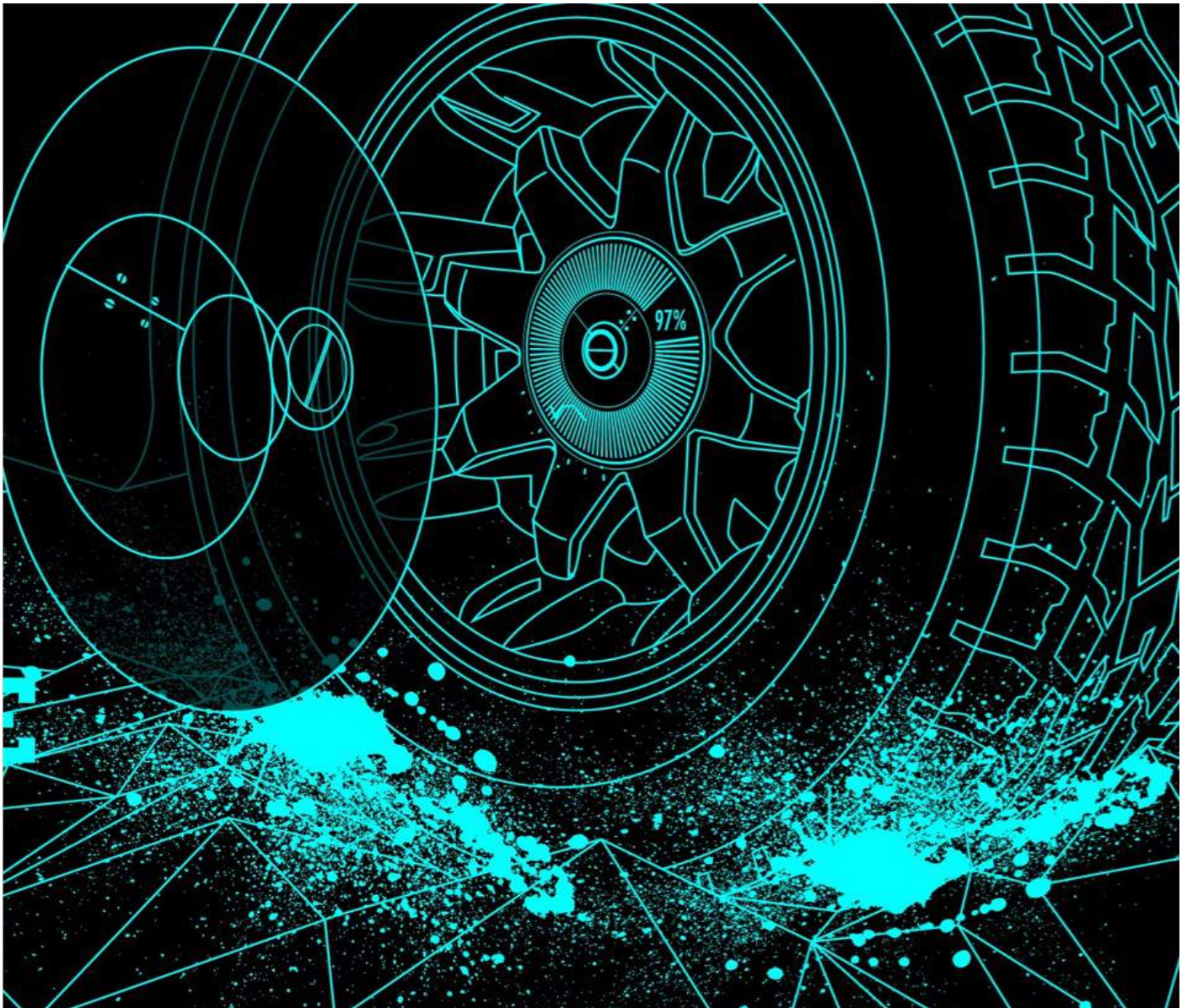


Tyre Design & Testing

A Course on Tyre Technology



4th September to 23rd October, 2021
Saturday and Sunday
10.00AM to 12.00PM



Indian Rubber Institute



About IRI

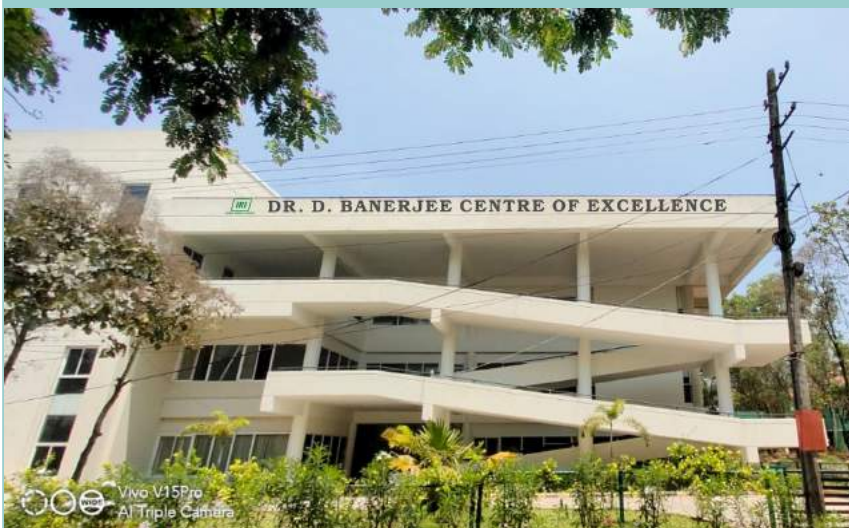
VISION :

TO BECOME A PREMIER INSTITUTE OF GLOBAL REPUTE IN RUBBER TECHNOLOGY EDUCATION, TRAINING AND SKILL DEVELOPMENT IN THE ASIA PACIFIC REGION

Indian Rubber Institute (IRI), is a professional body of rubber technologists, engineers, scientists, academicians and other professionals and organizations associated with the rubber and allied industry in India. A non-profit organization of 63 years standing, IRI was constituted as a national body and got registered on 25th May 1987 under the West Bengal Societies Act XXVI of 1961 no. S/55295 of 1987 – 88 and has since been continuing its educational and training activities.

With headquarters at Mysuru Karnataka and Commercial Headquarters at Kolkata, IRI has been functioning from eight branches at Chennai, Delhi, Gujarat, Karnataka, Kerala, Kolkata, Mumbai, and Rajasthan..

In order to substantially enhance the academic activity and to support rubber Industry, IRI is setting up Dr. D Banerjee Centre of Excellence in JSS Institution campus, Mysuru, Karnataka in 10000 sft area. The center will be equipped with all types of facilities for training, education and testing of rubber products. The center will be approved skill development center by Govt of India and NABL accredited laboratory for rubber and tyre testing.



Dr. D Banerjee Centre of Excellence, Mysuru, Karnataka, INDIA

Tyre Design & Testing

Tyre is a complex product. It is a hi-tech composite product where materials with contrasting characteristics work in tandem. Tyre making needs extremely careful attention as it is the only part of vehicle that touches ground.

Tyre Design is a complicated process. The product demands conflicting requirements. This makes the designing of a tyre an extremely challenging job. The design of a tyre requires a perfect balance amongst various conflicting needs. It is the modern computational technology that helps in achieving these goals.

Tyre Design & Testing is a carefully designed course that takes you through the complex process of tyre design and its testing. The important steps, critical parameters, fine balance of conflicting needs and engineering behind the tyre design has been thoroughly dealt in this program. The contour, pattern, structure and mold design has been explained with simplicity in the computational environment as well as through fundamental mathematical models.

Tyre Testing is an integral part of design process. The course gives ample stress on modern technique and system (indoor and outdoor) that is being practiced across the globe along with the regulatory requirements.

Tyre failure mechanism gives an insight into the theory which all technologists should know.



For Whom

- Tyre Design Engineers
 - Process Technologists
 - R & D Engineers & Scientists
 - Compound Developers
 - Validation & Test Engineers
 - Diploma Engineers
 - Graduate Engineers
 - Rubber Technology Students
 - Polymer Science Students
 - Vehicle Test Engineers
 - Graduate Engineer Trainees
-



Speakers

Dr. R Mukhopadhyay, (48 Years), PhD , Rubber Science and Tyre Technology

Dr. R. Mukhopadhyay has more than 48 years of experience in Education, Training and Research in Rubber Science and Tyre Technology. After doing his Ph. D in Applied Chemistry from IIT Kharagpur, he took up teaching in the 70's as a Faculty in Applied Chemistry at I.I.T, Kharagpur before moving into corporate world. He is the Director and CEO of HASETRI since its inception in 1991 and Director (R&D) of JK Tyre since 2001. He is credited with more than 180 research and Technical Papers in National & International journals and seven Patents from his research work. He guided ten scientists to their Ph. D.

He is the Chairman of Indian Rubber Institute (IRI) and Fellow Member of Indian National Academy of Engineers (FNAE), The Institution of Engineers India (FIE), American Chemical Society-Rubber Division, Member Board of Directors of Rubber, Chemical & Petrochemical Skill Development Council (RCPSDC), NSDC, Govt. of India.



Vitesh Kumar Giri (25 Years), B Tech, Ex PGP

Tyre Design & Development



Vitesh Kumar Giri is a seasoned tyre professional having 25 years of experience in designing and developing tyres. Prior to founding CRYT Innovation (A Rubber & Tyre Consulting Firm), Vitesh worked as Design Head at a leading tyre manufacturer in India. He has a Bachelor degree in Mechanical Engineering from NIT Jamshedpur, a PG Diploma in Management from IIM Indore and a Leadership Course certification from IIM Bangalore. Vitesh focuses his practice on Tyre Design and is considered to be India's most experienced designer in TBR segment. He is also the Chief Editor of The CRYT Weekly, a popular e-magazine for the tyre professionals

Dr. Samar Bandopadhyay, (30 Years), M. Tech PhD Rubber & Material Science

Dr. Samar Bandopadhyay is a well experienced rubber technologist with 30+ years of experience in rubber & tyre compounding, material selection and testing. With M. Tech degree in plastic and rubber technology, he did his Ph. D in 2007. After spending 22 years in tyre and rubber industry, he served as Head R&D at Pidilite Industry before moving to Pukhraj Industries as Business head. He is visiting professor in various universities and is permanent faculty member of DIRI course conducted by IRI. He is fellow member of Institute of Engineers, Lead Assessors at NABL. He has 60 Technical papers and various book chapters to his credit.



Dr. Prasenjit Ghosh, (20 Years), M.Tech, PhD

Finite Element Modelling



Dr. Prasenjit Ghosh, is a seasoned professional with 20+ years of rich experience in the field of Finite Element Analysis of Automotive Products. Dr. Ghosh holds MTech. degree from IIT Kharagpur and Ph.D. degree from IIT Madras. He is conversant with CAE software such as Simulia (Abaqus), Patran, Autocad and Hypermesh. He is seasoned speaker in national / international conferences. He is a Fellow Member (FIE) of Institution of Engineers (India), Member of Society of Automotive Engineers (SAE), India and Member of Indian Rubber Institute (MIRI). He has about 35 research publications in International Journals, Conferences and book chapter to his credit.

Prakash C Bohra (37 Years), BE Mech , Vehicle Dynamics



Prakash Chand Bohra is a Mechanical Engineer having 37 years of rich experience in the field of tyre and automobile testing. He is the first person in Indian Tyre Industry to begin work on FEA and Vehicle Dynamics way back in 90s. His vast experience spans into product development, process technology, Research & Development, Finite Element Model, Vehicle Dynamics, Tyre Testing and NVH. He has presented more than 20 papers in various magazines and seminars and conferences. He is currently attached with Automotive Test Systems as Director (Research Projects).

Elangovan G (32 Years), B. Sc. PGD Structure Design

Elangovan G is a qualified Rubber Technologist with 32 years of qualitative experience in Manufacturing process Technology with a wide exposure in Mixing, extrusion, 4 Roll calendar, Tire Engineering & Specialization in Heat Engineering. Expertise in 2 & 3 Wheeler, Bias Pass & LT, MCR, PCR, LTR & Aero product categories, Bladder & Tube operations. Instrumental for establishing an entire manufacturing process setup and production ramp up in green field projects at M/s. CEAT Ltd Nagpur. Industrialized more than 150 SKU's includes puncture safe patented products. He has a Bachelor's Degree in Science from University of Madras, B. Ed from Bharathiar University and PGD- IRI from IIT.



Arijit Dey (10 Years), BE, M. Tech Mold Design



Arijit Dey is an expert on tyre design (TBR, PCR; OTR TIRE; development and manufacturing Tire pattern design, construction design, testing and evaluation, **mold design**. Arijit Dey is professional manager with over 10 years progressive experience in strategic planning, improving operational efficiency, team building and project management for tire industry. Arijit Dey worked as Tire simulation Manager for Birla Tyres as well as Manager in Ascenso tires as a R&D Manager. He has a bachelor degree in Mechanical Engineering from West Bengal University of Technology, a Master's degree (M. Tech) from IIT Bombay in Mechanical Engineering. Arijit Dey is also working as a Technical Director of tire consulting for Feana Design Pvt Ltd.

Avinash Tomer (12 Years), BE Tech Mech , PGD

Avinash Tomer is an experienced tyre professional having 12 years of experience in testing and validating tyres for NVH and Vehicle Dynamics characterization. He has been an active member of Tyre Mechanics Group and been involved in various OE projects over the years as well in continuous expansion and establishment of current and new tyre testing capabilities of the department. He has been actively involved in managing and conducting regulation tests for Wet Grip using Skid Trailer and Coast by Noise as per ECE R117/ AIS 142. He is a BE Mech, a PGD in International Business & PGD Rubber Science.



Course Contents

Theory : 90 minutes

Q&A : 30 minutes

Session 1	Overview of Tyre Technology Rubber, a versatile material Tyre a Hi-tech composite Present & future tyre technology	Dr. R Mukhopadhyay
Session 2	Introduction to Tyre Tyre Evolution Tyre Terminology, Categorization & Comparison Decipher tyre markings on Sidewall A glimpse of Tyre Manufacturing Process Major raw material used in tyre	Vitesh Kumar Giri
Session 3	Tyre Design and Development Process Globally used design processes—APQP and Stage Gate Design Tools—Voice of Customer, QFD, DFMEA etc. Robust Design Process	Vitesh Kumar Giri
Session 4	Tyre Contour Design Dimension finalization & Contour design (Bias and Radial) Natural Equilibrium Theory of ply line and improvisations Developing cord path Load Capacity Calculation	Vitesh Kumar Giri
Session 5	A Practical Approach to Pattern Design SAE system of Force and Moment Patterns for different applications A practical approach to pattern design for noise/ aquaplaning	Vitesh Kumar Giri
Session 6	Compound & Material Selection Rubber compound used in tyre, their functions and design philosophy Application specific selection of compound & material Compound to meet important characteristics like RRC, Wet Grip Properties of Nylon, Polyester, Steel and their effect on tyre design	Dr. Samar Bandopadhyay
Session 7	Computational Methodology in Tyre Design Introduction to Finite Element Model (FEM) Use of Computer Aided Engineering (CAE) in tyre design Hydroplaning, Stress-Strain, RRC, Temperature prediction methods Noise Analysis methods	Dr. Prasenjit Ghosh

Continued...

Session 8	Tyre Structure Design Cured Tyre Layout design, Carcass, Bead strength & Safety Factor Conversion of CTL to green components like Tread / Sidewall Green angle calculation for plies and belts, Drum Set Calculation	Elangovan G
Session 9	Principle of Mold Design Understanding Mold .. 2 Piece and Segmented Type & their components Mold Design Process Tools and Accessories Design such as Bead Rings	Arijit Dey
Session 10	Destructive & Non-Destructive Testing Cut Tyre Analysis , Identification of Critical parameters Tyre Non-uniformity ... Cause, Analysis and Corrections Run Out, Balancing, X-Ray, Shearography, CT-Scan in tyre	Vitesh Kumar Giri
Session 11	Tyre Character Testing Various test machines used for tyre testing High speed, Load Endurance, Plunger & Foot Print tests and measurements Measurement & Understand of RRC, Force & Moment, Spring Rate test	Avinash Tomer
Session 12	Vehicle Dynamics Introduction to Vehicle Dynamics Tyre as a vehicle System Effect of Vehicle Characteristics on Tyre and its response	Prakash C Bohra
Session 13	Outdoor Testing of Tyre Controlled test on test tracks, Skid Trailer testing Test for high speed, slalom, NVH testing and coast by Noise testing Testing for International regulations like R117	Avinash Tomer
Session 14	Tyre Failure Analysis Mechanism of Tyre Failure Tyre Failure Conditions and Analysis Mechanics of Tyre wear Vehicle Induced Uneven wear and corrective action	Vitesh Kumar Giri
Session 15	Future of Tyre Technology Factors that will affect tyre technology in future Airless and Run flat Tyres Use of Artificial Intelligence, Machine Learning and Sensors in tyres Design Philosophy for EV, AV and Shared Mobility Material Sustainability and Green Eco friendly Tyres	Vitesh Kumar Giri

Course Fee (Per Delegate)

Indian : INR 16,949/-

Foreigners : US\$ 299/-

Students : INR 11,949/-

- *18% GST Extra*
- *10% Discount on nomination of 5 delegates from same organization*
- *Students must be presently enrolled in full time in an accredited Institute/ university*
- *Course fee includes Certificate ,Study Material and Medal*
- *Fee is non-refundable / Non- Adjustable, however change in nomination can be accepted*

Program Director —DR. R Mukhopadhyay, Chairman (IRI)

Program Co-Ordinator —Vitesh Kumar Giri, Founder, CRYT Innovation

To Register, please visit www.iri.net.in or write to iri-dbcoe@crytmail.com

INDIAN RUBBER INSTITUTE

Dr D Banerjee Centre of Excellence
JSS Technical Institution Campus,
Mysuru– Karnataka, INDIA 570 006

www.iri.net.in

Phone : 9902324101

E-mail: iri-dbcoe@crytmail.com

