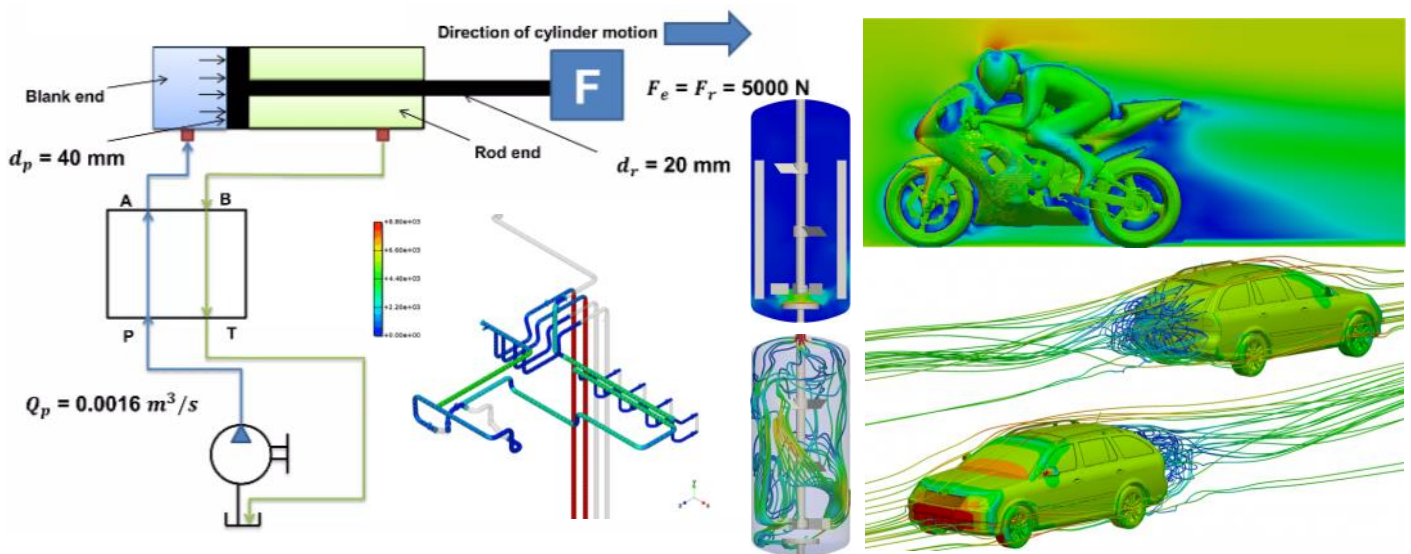




IIAS

Indian Institute for Autonomous Systems

HANDS-ON WORKSHOP ON FLUID SYSTEM ANALYSIS



Workshop Details

- Schedule and Type:** Apr. 13 to Apr. 18, 2026; Instructor led interactive + demo + QA + hands-on practices
- Workshop Duration:** 10:00 AM-6:00 PM; 40 Hours (10 hours for foundation, 30 hours for hands-on practices), 1 week
- Attendee Background:** Mech., Automotive, Aerospace and Robotics
- Instructors:** Dr. Prashanth Dalawai
- Registration Link:** www.iias-uv.in/services/training/workshops/
- Registration Deadline:** Apr. 13, 2026 and **limited seats available**

Workshop Objective

Fluid system design & analysis involves engineering networks that move and control liquids/gases (like hydraulics, pneumatics, HVAC) by selecting components (pumps, pipes, valves) and analyzing flow, pressure, and energy transfer, often using tools like CFD (Computational Fluid Dynamics) for complex simulations to ensure efficiency, stability, and performance for applications from aerospace to industrial robotics, ensuring heat/mass balances and predicting behavior under various conditions. Fluid dynamics in design studies the liquids & gases (fluids) move, essential for creating efficient products like aircraft, cars, pipes, & even medical devices, by applying conservation laws (mass, momentum, energy) through theory, experiments (wind tunnels) Computational Fluid Dynamics (CFD) simulations to optimize shapes for lift, drag, flow, & performance, ensuring safety & efficiency by predicting fluid behavior.

IIAS training division offers an advanced training program and workshop by providing both theoretical, computational and hands-on testing foundations and real-world case studies on automotive, aerospace and heavy engineering and other rotating machinery. These programs concentrate more on the faster adaptation of technology to the respective industries and reduce the training curve. This workshop is carefully designed to give the essential fundamentals as well as practical implementation skills through the instructor, who has decades of experience in teaching this course, designing and analyzing a variety of structures in industry.

After attending, the participant will learn to design, mesh and simulate complex fluid domains using the leading and latest OpenFOAM software to virtually create and test the systems. The fresh engineers can get ready for the industry and take career assistance support.

Workshop Content

Fundamentals of Fluid System Design and Analysis: Duration (Hrs.):10

Sl.	Topic	Date
1	Fundamentals of Fluid Statics and Dynamics: Fundamental laws, forces and moments, stability, flows and patterns, fluid thermodynamics. Fluid analysis via AI.	Apr. 13
2	Design of Fluid and Thermal Systems: Design considerations of fluid machinery systems, piping, heat exchangers, propulsion, flight dynamic systems.	Apr. 13
3	Introduction to Computational Fluid Dynamics: History of CFD, Euler's and Navier-Stokes and energy equations. and CFD applications.	Apr. 13/14
4	Methodology in Computational Fluid Dynamics: Classification of governing equations and their numerical solutions, Case studies.	Apr. 14
5	Advanced Topics in Modern CFD: Unsteady analysis, multiphase and advanced turbulence modelling, AI, Data-Driven and Generative CFD Techniques.	Apr. 14

Hands on Fluid System Design Analysis Exercises: Duration (Hrs.):40

Sl.	Topic	Date
1	Fluid and Thermal design capabilities of commercial software's: Cradle CFD, ANSYS CFX, ANSYS Fluent, Salome Meca, PTC Creo flow analysis, CFD Python and Open-FOAM. Demonstration.	Apr. 15
2	Introduction to Fluid and Thermal design using OpenFOAM -v2512: Capabilities, Fluid Dynamics/Physical Modelling, Numerical Solution, Geometry and Meshing, Post-processing, Computing and Programming and hands on examples.	Apr. 15
3	Flat plate boundary layer	Apr. 15
4	Flow past a cylinder	Apr. 15
5	Flow past an airfoil	Apr. 15
6	Flow past an sphere	Apr. 16
7	Rayleigh Benard convection analysis example	Apr. 16
8	Channel flow	Apr. 16
9	Lid-driven cavity flow	Apr. 16
10	Spinning cylinder	Apr. 16
11	Kelvin-Helmholtz instability	Apr. 17
12	Couette flow	Apr. 17
13	Rotating channel flow	Apr. 17
14	Snappy hex mesh example	Apr. 17
15	Steady state thermal analysis of heat sink	Apr. 17
16	Steady state thermal analysis of cylinder	Apr. 18
17	Transient thermal analysis	Apr. 18
18	Flow in an aerated stirred tank	Apr. 18
19	Hot radiation in a room	Apr. 18
20	Modeling of turbulent combustion	Apr. 18

Slots are flexible based on the batch request and resource availability.

Workshop Closure

Sl.	Topic	Date
1	Assessment and feedback, issuing of certificates and concluding the workshop.	Apr. 18

About IIAS

IIAS (Indian Institute for Autonomous Systems) is set up primarily to fill the gap between academia and industry in the development of machines, unmanned vehicles and autonomous systems, allied technologies, and to create a related skilled workforce. IIAS have personnel with extensive expertise in serving the leading industries and academia in the cutting-edge technologies. IIAS is located in the heart of the city with modern teaching aids, facilities, and resources for both creating and deploying design, analysis and control solutions for the machinery and vehicles.



About Instructor

Dr. Prashanth Dalawai has 30 years of experience in the R&D sectors of leading Indian and multinational companies and in a few of the oldest institutes in India. He holds a B.E. in mechanical from Karnatak University, M.Tech., and a Ph.D. in mechanics and design stream from IIT Kanpur in NVH techniques for controlling vehicle and engine health (IVHM).

He is serving as the founding director of IIAS. He served the leading MNCs such as AVL List GmbH, Cummins Inc., General Electric and Indian OEM in different roles, as well as automotive, aerospace and heavy engineering clients. He also served as the UGC approved faculty in the mechanical department and founding head of the aerospace engineering.

He has taught the Fluid Mechanics, Fluid Machinery and CFD course to the undergraduates for successive years. In his industrial and academic research career, he has extensively designed and analyzed a variety of fluid systems, using commercial and inhouse tools for the performance requirements.



Contact Us

Indian Institute for Autonomous Systems (IIAS)
36, 80 Feet Road, Hoysala Circle West, Kengeri Satellite Town,
Bengaluru, 560060, INDIA, Tel: +91-080-2974605,
Email: info@iias-uv.in, Web: www.iias-uv.in

