

# Government of India MHRD sponsored GIAN course on

## Wind Tunnel Design and Testing from a Practical Perspective

### Overview

Wind Tunnels are essential tools for Aerodynamic research. They are predominantly used for conducting aerodynamic measurements on scaled down models of aerospace vehicles like civil and military aircrafts, aircraft components like wings and tail planes, helicopters and flapping wing vehicles, spacecrafts, missiles etc. Apart from aerospace applications, they are also widely used for aerodynamic measurements of automobiles, trucks, high speed trains, earth fixed structures like high rise buildings, chimneys, bridges, solar panel arrays etc. The international expert involved in this course, Prof. Moshe Zilberman, has been associated with the Israel Aerospace Industries (IAI) for a long time. He has held very high positions like Head of Wind Tunnel Facility, Director Marketing etc. During the past few years he has moved to academia. He is currently serving as Head, Department of Mechanical Engineering Azrieli, Academic College of Engineering, Jerusalem, Israel.

This course would introduce participants to both fundamental principles and practical issues of wind tunnel design and testing. In addition to the classical methods and practices, state-of-the-art developments would be discussed. In this course, Prof. Zilberman will share knowledge from his extensive practical experience in aircraft industry, execution of challenging research projects, and successful design and installation of several wind tunnels. The participants will get an exposure of various theoretical and practical aspects of wind tunnel design and testing from an industry leader. The topics covered will include latest approaches for efficient design of wind tunnel components, design practices for achieving high quality flow, wind tunnel construction, installation & operational issues, design and testing issues related to specific applications covering both aerospace and non-aerospace domains, wind tunnel instrumentation and model preparation, wind tunnel testing etc.

### Objectives

The primary objectives of the course are as follows:

- Exposing participants to the fundamental aspects of wind tunnel design and testing. Enhancing their background knowledge so that they are able to appreciate the major issues and challenges involved.
- Application of basic principles to carry out hands-on simple design exercise from first principles.
- Basic exposure to multidisciplinary aspects of wind tunnel design. Preliminary knowledge of various subsystems of a modern wind tunnel.
- Exposure to wind tunnel instrumentation and measurement techniques.
- Practical information and exposure to wind tunnel design and testing so that participants develop the confidence to design and build facilities in future.

<b>Modules</b>	<b>A: Basic concepts of Wind Tunnel Design and Testing: July 3-5, 2016</b> <b>B: Some more topics on Wind Tunnel Design and Testing: July 6-8, 2016</b>
<b>You Should Attend If...</b>	<ul style="list-style-type: none"> <li>• Practicing engineers and scientists of R&amp;D Laboratories who are interested in acquiring state of the art practical knowledge in the field of wind tunnel design and testing.</li> <li>• Faculty members teaching Aerospace Engg/ Mechanical Engg at reputed universities looking for a refresher course/ updates on advances in wind tunnel design and testing.</li> <li>• B.Tech/ M.Tech/ Ph.D students/ research fellows working in the area of Aerospace or Mechanical Engg in reputed institutes who are interested in obtaining improved knowledge on wind tunnel design and testing practices.</li> </ul>
<b>Fees</b>	<p>The participation fees for taking the course is as follows:</p> <p><b>Participants from abroad : US \$500</b></p> <p><b>Industry/ Research Organizations: INR 20000 for any one module/ INR 30000 for both modules</b></p> <p><b>Academic Institutions: (a) Faculty: INR 10000 (both modules) (b) Student: INR 2000 (both modules)</b></p> <p>The above fees include all instructional materials, computer use for tutorials and assignments, 24 hr free internet facility. The participants will be provided with accommodation on payment basis.</p>

# Teaching Faculty

## International Faculty



**Prof. Moshe Zilberman (email id: [moshezi@jce.ac.il](mailto:moshezi@jce.ac.il))** is currently Head of Mechanical Engineering Department, Azrieli, Academic College of Engineering, Jerusalem and Head of Test Engineering branch at the Mechanical Engineering Association of Israel. He is also associated with Technion, Israel. Before moving to academia, Prof. Zilberman served as Manager R&D, Wind Tunnel Center, Israel Aerospace Industries (IAI) from 1979-1997. He later served as Director, Marketing and Sales, IAI, Commercial Aircraft Group & Engineering during 1997-2014. At the Wind Tunnel Center, Dr. Zilberman developed a hypersonic wind tunnel and new methods in both business jet and fighter aircraft testing. His work on drag reduction through the utilization of Large Eddy Break-Up devices has been appreciated and cited by NASA. His research interests include various topics of aerodynamics, namely, hypersonics, separation of vehicles, boundary layer stability and transition low Reynolds number airfoils, wind energy etc. He has worked closely with late Dr. A.P.J. Abdul Kalam and with many of his successors in DRDO.



## Host Faculty



**Prof. A. Roy (email id: [arnab@aero.iitkgp.ernet.in](mailto:arnab@aero.iitkgp.ernet.in))** is an Associate Professor of the Department of Aerospace Engineering at the Indian Institute of Technology Kharagpur, India. He has around 15 years of teaching and/or research experience in various institutes of importance in India and has also travelled to several research laboratories in foreign universities. His research interests include low Reynolds number aerodynamics, high accuracy flow solver development, aerodynamics of high speed trains, bluff body aerodynamics etc. He has undertaken several sponsored projects funded by AFOSR (AOARD, Japan), Boeing (USA), ISRO, ARDB, DRDO, Indian Railways, DST etc. He has authored several research papers in peer-reviewed international journals and notable conference proceedings. He has also served as reviewer of many journals.



**Prof. K. P. Sinhamahapatra (email id: [kalyanps@aero.iitkgp.ernet.in](mailto:kalyanps@aero.iitkgp.ernet.in))** is a Professor in the Department of Aerospace Engineering at IIT Kharagpur. He has obtained his Ph.D, M.Tech and B.Tech degrees in Aerospace Engineering from IIT Kharagpur. Prof. Sinhamahapatra's research spreads across various aspects of Computational Fluid Dynamics. He has published more than 50 quality research articles in peer-reviewed international journals and refereed conference proceedings. He has been appointed as the first HAL Chair Professor by Hindustan Aeronautics Limited (HAL) at IIT Kharagpur. Prof. Sinhamahapatra is a member of many professional societies. He is presently serving as the Panel Member in the reputed Aerodynamics Research & Development Board constituted by Government of India. In addition, he has also worked as Head, Aerospace Engineering at IIT Kharagpur. Prof. Sinhamahapatra has handled a large number of research and consultancy projects of national importance.

## Course Coordinators

### Professor A. Roy

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### Professor K. P. Sinhamahapatra

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The participants have to register through the GIAN portal ([www.gian.iitkgp.ac.in/GREGN](http://www.gian.iitkgp.ac.in/GREGN))

The maximum number of participants who can be accommodated in the course is 50