

CMR ENGINEERING COLLEGE

UGC AUTONOMOUS CAMPUS

Approved by AICTE-New Delhi | Affiliated to JNTUH | Accredited by NAAC & NBA

Kandlakoya, Medchal Road, Hyderabad-501401

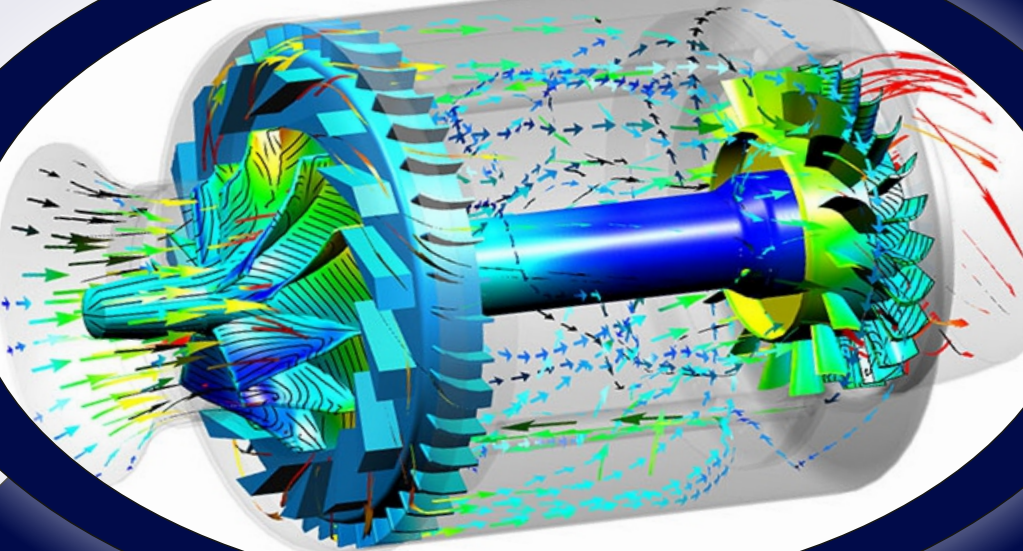
SERB - INDIA SPONSORED



**Two-Day National Seminar
on**

**“OPTIMIZATION AND PERFORMANCE EVALUATION OF
TURBOMACHINERY THROUGH COMPUTATIONAL FLUID
DYNAMIC SIMULATIONS”**

10th & 11th April , 2024



Organized by

DEPARTMENT OF MECHANICAL ENGINEERING

CMR ENGINEERING COLLEGE

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www.cmrec.ac.in

About CMR Engineering College

CMR Engineering College has strongly acknowledged as one of the pioneer of autonomous institutions in Engineering and prominently known as CMREC. It is the brain child of the clairvoyant Ch.Narasimha Reddy an agriculturalist, who transformed himself into an educationist. Established in 2010, in a vast expanse of 10 acres, with a high aim to provide an ideal and perfect platform to students in the field of Engineering & Technology for their highly rated academics, i.e all-round career and enhancement of student's ethical personality development. CMREC is offering undergraduate courses Computer Science and Engineering, CSE (Artificial Intelligence & Machine Learning); CSE (Cyber Security);



CSE (Data Science); Artificial Intelligence & Data Science; Information Technology; Electronics and Communication Engineering; Mechanical Engineering and postgraduate courses (M.Tech VLSI System Design, Computer Science Engineering).

Department of Mechanical Engineering

The Department of Mechanical Engineering is a vast and diversified field of scope. It has fit with Sophisticated and state-of-the-art infra structural facilities, required to impart high quality of education to the Mechanical students. Events like Seminars, Workshops, and Faculty Development Programs are frequently conducted in the department to keep faculty and students updated with latest developments in various technologies. There are student technology clubs namely "Society of Automotive Engineers", "Robotics Club", and "Design and Manufacturing Club". Our students enthusiastically do expertise in designing and fabricate working models, at



the same time they too participate in National level competitions like BAJA, E-Bike Challenge, Go-Kart etc. Students are made to become members of SAE, ISTE and ASHRAE Professional Societies. To make the students as well as faculty members aware of multiple professional societies activities the department is often organize various activities related to the professional bodies. A special wing of Industry Institute is set by the department to update the students and faculty with latest industrial practices.

Objectives of the Seminar

The turbomachinery industry is going through a phase of transformation. The need for technologies to continue to push efficiencies through advanced material and cooling technologies makes it one of the most exciting contemporary mechanical engineering areas. Computational Fluid Dynamics (CFD) has seen significant importance over the past years, and today, it has reached the level of delivering accurate results using robust solvers in relatively shorter times. It essentially serves to understand the behavior of heavy turbo machinery equipment, dealing with fluid flow, by virtual simulations of flow and its effects on components while in operation. This eliminated the time required for prototype testing and applying similar analysis results for other ducts across the plant facility.

Overview of the Seminar

This seminar provides in depth knowledge to faculty with a background in Mechanical and allied branches (Aerospace, Applied Mechanics, Automobile, Civil, Chemical, Metallurgy and Ocean Engineering / Naval Architecture) from engineering colleges as well as a refresher for practicing engineers.

Seminar Outline

This two-day seminar will focus on design optimization and its applications to the design of fluid machinery, such as pumps, compressors, turbines, fans, and so on. Although flow analysis in a complex flow passage is difficult and takes a lot of computing time, unlike structural analysis, design optimization based on three-dimensional flow analysis has become popular even in the fluid machinery area in the last couple of decades with recent developments in computing power. Now, fluid machinery design has been further improved by applying design optimization based on CFD as an additional design procedure. Thus, design optimization has recently become popular in fluid machinery design, where optimum objectives are found by changing the design variables.

Main Seminar Topics are;

Day-1

- Compressors, Fans and Pumps
- Turbines - Design-Structures and Dynamics
- Heat Transfer - Impingement and Leading-Edge Cooling
- Gas Turbine Combustion, Fuels and Emissions
- Structures and Dynamics – Rotors, Fatigue and Testing
- Renewable Energy (Hydro, Solar, and Wind), Alternate Power Generation
- Case Study-1: Multi-Point Optimization of an Axial Turbine Stage
- Case Study-2: Description, Geometry Parametrization, and Meshing
- Case Study-3: Centrifugal, Axial-Flow, Mixed-Flow, and Cross-Flow Fans

Day-2

- Analytics & Digital Solutions for Gas Turbines/Rotating Machinery
- Coatings, Composites, CMCs, Additive Manufacturing
- CFD and its Application in Turbomachinery
- Case Study-4: Aerodynamic Analysis of Fans
- Case Study-5: Optimization Problems and Algorithms Used for Fan Optimization
- Case Study-6: Optimization of Fluid Machinery for Renewable Energy Systems

The two-day national seminar is intended to provide all the concepts in more depth for faculty members as well as a refresher for practicing engineers working in the field of Turbomachinery.

Resource Persons

This national seminar focuses on basic concepts in computational fluid and structural mechanics, and turbomachinery,. It explains the computational methods used in the analysis of fluid-structure interaction problems in a clear manner – all taken from the vast research experience of keynote speakers in this field. Other relevant talks will be delivered by senior engineers. In addition to the instructional talks, we plan to have 5-6 research talks from IIT's research groups, which will give a glimpse of the exciting research happening in the areas of Computational Fluid dynamics and Turbomachinery.

Who can Attend?

The course is open to faculty with a background in Mechanical and allied branches from engineering colleges approved by AICTE. No course fee is charged from participants. Practicing engineers, researchers, and software developers at universities, industry, and government laboratories will find this refresher programme, an indispensable source for new engineering approaches.

Overview of the Seminar



SCAN ME

<https://forms.gle/jsXpxMJh5JvJETRF8>

Criteria for Certification of Participants

- Participant must have minimum 80% attendance for the session.
- Random test on daily basis should be carried out with minimum 5 objective / multiple choice questions on the topic covered for the day.
- Minimum 60% or more in final assessment test which should preferably objective type with minimum 50 questions on all topics covered in session with uniform distribution over topics.

Important Dates

Last Date of Registration : 01-04-2024
Confirmation of Registration : 05-04-2024
Schedule of the Event : 10th & 11th, April 2024

Organizing Committee:

Dr. K. Rajendra Prasad, Professor
Dr. K. Srinivasa Reddy, Professor
Dr. N. Jeevan Kumar, Professor
Dr. K. Harinarayana, Professor
Mr. Lakshmipathi Yerra, Associate Professor
Mr. Y. Srinivasa Reddy, Associate Professor
Mr. K. Chinna Maddaiah, Assistant Professor
Mr. M. Rajesh, Assistant Professor

CHIEF PATRONS



Shri. Ch. Narasimha Reddy
Chairman



Shri. Ch. Bhoopal Reddy
Vice-Chairman



Shri. Ch. Srisailam Reddy
Secretary and Correspondent



Dr. A. Srinivasula Reddy
Principal

PATRON



CONTACT DETAILS

Programme Convener

Dr. C. SYAMSUNDAR

Professor and Dean R&D

Dept. of Mechanical Engineering

CMR Engineering College,

Telangana State, INDIA, Telephone: +91-98408 91252

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Registration Form

Name: _____

Email ID: _____

Institution Address: _____

Address for Communication: _____

Mobile No.: _____

Date: _____ Place: _____

_____ Signature of the Delegate: _____

Certified that Dr./Prof./Mr./Ms. _____

is a bonafide student/faculty member of our Institution.

He / She is identified to attend this seminar.

Signature & Seal of the Principal/Head