



Saranathan College of Engineering
Trichy-12



Department of Mechanical Engineering

AICTE Sponsored one week Short Term Training Programme (STTP)

on

**Rudiments and Practices of Computational Fluid Dynamics in
Thermo Fluid Analysis**

Phase II - 24/05/2021 to 29/05/2021

The Department of Mechanical Engineering of Saranathan College of Engineering, Trichy organized a one week Short Term Training Programme (STTP) titled “**Rudiments and Practices of Computational Fluid Dynamics in Thermo Fluid Analysis**” in two phases. **Phase II** of the STTP was conducted from 24th May 2021 to 29th May 2021. This program was sponsored by AICTE, New Delhi. The programme began with the keynote address by Dr. Sudhakar Yogaraj, Assistant Professor, Department of Mechanical Engineering, IIT Goa, who gave a broad perspective of Computational Fluid Dynamics and its relevance in solving real time thermo fluid. The training program was well structured with twenty-four technical sessions in which lectures were delivered by experts from eminent institutes like IITs, CEG (Anna University) etc. and practising CFD engineers and scientists from PSUs like BHEL (Trichy), IGCAR, Kalpakkam and other corporate units. A broad range of topics were covered during the sessions – topics ranging from fundamental concepts of Computational Fluid Dynamics to live demonstrations on applying CFD software tools in solving real time thermo fluid problems. The training program concluded with a valedictory address by Dr. S.M.Giriraj Kumar, HOD/ICE & Head (T&P), SCE, who gave a brief overview of the National Education Policy (NEP) and highlighted the salient features of the policy. The programme was well attended by academicians and researchers from all over Tamil Nadu and other neighbouring states and 41 attendees received certificates.



SARANATHAN COLLEGE OF ENGINEERING
 (Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)
 (Accredited by NAAC with A+ Grade)
DEPARTMENT OF MECHANICAL ENGINEERING
 (Accredited by NBA)



AICTE Sponsored One Week Short Term Training Programme on
 Rudiments and Practices of Computational Fluid Dynamics in Thermo Fluid Analysis
SCHEDULE OF TRAINING PROGRAMME-Phase II
 (24/05/21 to 29/05/21)

20.05.2021

Day/ Session	SESSION-I (9.45 A.M -11.15 A.M)	SESSION-II (11.30 A.M – 1.00 P.M)	L U N C H B R E A K	SESSION-III (2.00 P.M – 03.30 P.M)	SESSION-IV (3.45 P.M – 5.15 P.M)
24.05.21 MON	Dr.Sudhakar Yogaraj, Assistant Professor, Dept. of Mechanical Engineering, IIT, Goa. <i>Inaugural address and CFD- Basics and Governing Equations-Part I.</i>	Dr.Sudhakar Yogaraj, Assistant Professor, Dept. of Mechanical Engineering, IIT, Goa. <i>Proposed topic: CFD- Basics and Governing Equations -Part II.</i>		Dr. K. Arul Prakash, Professor, Dept. of Applied Mechanics, IIT- Madras, Chennai. <i>Proposed topic: Finite Volume method –Part I.</i>	Dr. K. Arul Prakash, Professor, Dept. of Applied Mechanics, IIT- Madras, Chennai. <i>Proposed topic: Finite Volume method –Part II.</i>
25.05.21 TUE	Dr. R. Shivakumar, Professor & Dean, School of Mechanical Engineering, VIT-Chennai Campus. <i>Proposed topic: Applications of CFD- An Overview</i>	Dr.P.R.Naren, Associate Professor, Dept Of Chemical Engineering, SCBT, SASTRA, Tanjore. <i>Proposed topic: Reynolds-Averaged Navier-Stokes (RANS) Model Approach for Fluid Flow.</i>		Dr. Pallab Sinha Mahapatra, Assistant Professor, Department of Mechanical Engineering, IIT- Madras, Chennai. <i>Proposed topic: Multiphase Flow Modeling.</i>	
26.05.21 WED	Dr.S.Vengadesan, Professor, Dept.of Applied Mechanics, IIT- Madras, Chennai. <i>Proposed topic: Turbulent flow Modeling</i>	Dr.Kamatchi Sankaranarayanan, Assistant Professor-II (Biophysics), IASST, Autonomous Institute of DST, (Govt.of India), Guwahati, Assam. <i>Proposed topic: Multi-tasking Ionic Liquids - From protein stability to Nanomaterial Synthesis.</i>		Dr. M. Kantha Babu, Director, CIPR, and Professor, Dept. of Manufacturing Engineering, CEG, Anna University, Chennai. <i>Proposed topic: Research Patenting.</i>	

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27.05.21 THU	<p>Dr. Kulasekharan Narasingamurthi, Specialist-Computational Fluid Dynamics, Simulation Metier-GEEDS, Valeo India Private Limited, Chennai.</p> <p><i>Proposed topics:</i> 1. Design and Development of Compact Heat Exchangers 2. Gas Turbine Cooling System</p>		<p>Dr.M.Ganesan, Associate Professor, Dept of Mech. Engineering, Saranathan College of Engineering, Trichy.</p> <p><i>Proposed Topic:</i> <i>Fluid Flow Analysis using ANSYS-CFX</i></p>	<p>Dr. G. Jayaprakash, Professor & Head, Dept of Mech. Engineering, Saranathan College of Engineering, Trichy.</p> <p><i>Proposed topic:</i> <i>Fluid solid interaction (FSI) analysis in CFX.</i></p>
28.05.21 FRI	<p>Dr Vivek Vittankar Founder & Director of FluiDimensions, Pune.</p> <p><i>Proposed topic:</i> <i>CFD Application: Software Demo</i></p>	<p>Dr.P.Harish Assistant professor, Dept. of Mechanical Engineering, IIT Jammu, J& K.</p> <p><i>Proposed topic:</i> <i>Modelling of boiling heat transfer</i></p>	<p>Dr.K.Murugesan, Professor, Dept.of Mechanical and Industrial Engineering, IIT, Roorkee.</p> <p><i>Proposed topic:</i> <i>Computational Fluid Dynamics using Nanofluids by Velocity- Vorticity Equations.</i></p>	<p>Prof. Dr. G. Kumaresan, Associate Professor, Institute of Energy Studies, CEG, Anna University, Chennai.</p> <p><i>Proposed topic:</i> <i>CFD Analysis of Thermal System Components.</i></p>
29.05.21 SAT	<p>Dr.R.Elankovan, DGM(Commercial/Fossil Boilers), B.H.E.L, Trichy.</p> <p><i>Proposed topic:</i> <i>Grid Generation and Case studies on applications of CFD.</i></p>		<p>Dr. N. L. Parthasarathi, Scientific Officer, Metal Forming and Tribology Section, IGCAR , Kalpakkam.</p> <p><i>Proposed topic:</i> <i>Application of CFD- A power plant perspective.</i></p>	<p>Dr.S.M.Giriraj Kumar, Professor& Head, Dept. of ICE & Head(T&P), Saranathan College of Engineering, Trichy.</p> <p><i>Valediction and talk on National Education Poilcy(NEP)</i></p>

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Certification Test & Feedback

Certification test on 29/05/2021 at 4.45 p.m.

Coordinator

DAY 1: 24/05/2021

SESSION 1:

*Inaugural address and
CFD- Basics and Governing Equations-Part I.*

Dr.Sudhakar Yogaraj,
Assistant Professor,
Dept. of Mechanical Engineering,
IIT, Goa.

SESSION 2:

CFD- Basics and Governing Equations -Part II.

Dr.Sudhakar Yogaraj,
Assistant Professor,
Dept. of Mechanical Engineering,
IIT, Goa.

SESSION 3 & 4:

Finite Volume method

Dr. K. Arul Prakash,
Professor,
Dept. of Applied Mechanics,
IIT- Madras, Chennai.

DAY 4: 27/05/2021

SESSION: 1&2

- 1. Design and Development of Compact Heat Exchangers*
- 2. Gas Turbine Cooling System*

Dr. Kulasekharan Narasingamurthi,
Specialist-Computational Fluid Dynamics,
Simulation Metier-GEEDS,
Valeo India Private Limited,
Chennai.

REC Dr. Kulasekharan Narasingamurthi is presenting

GASTURBINE COOLING SYSTEMS

DR. KULASEKHARAN NARASINGAMURTHI
SIMULATION TECHNICAL MANAGER - CFD | SIMULATION COE | VALEO INDIA

Meeting details

- Mr. Vinodkumar Mech...
- Ms. MERCY VASAN MEC...
- Ms. Shivarajani Mech D...
- Naveen Joshi
- Satheshkumar K
- SCE Conference
- SCE Conference
- SURESH BABU MECH

REC Dr. Kulasekharan Narasingamurthi is presenting

ENGINE MATERIALS

- Blue: titanium is ideal for strength and density but not at high temperatures
- Red: nickel-based super-alloys
- Orange: steel used for the static parts of the compressor
- Green: Composite

Meeting details

- Enggertthil
- Syed Naseeruddin
- Mr. G. MAHESH M. (You)
- Ashish Desai
- Dhansini Dhansini
- DR DAGAMAH PMD SH...

SESSION:3

Fluid solid interaction (FSI) analysis in CFX.

Dr. G. Jayaprakash,
Professor & Head,
Dept of Mech. Engineering, Saranathan College of
Engineering, Trichy.

Dr. G. Jayaprakash MECH HOD is presenting

Computational Fluid Dynamics

- It is a technique of modeling and simulation based on numerical modeling for fluid flow.
- It is a science that uses data structures to solve issues of fluid flow - like velocity, density and chemical compositions.
- It is the combination of physics, flow technology, computer applications, mathematics and mechanics.
- It is useful to solve real world problems which can not be solved by theory and may be expensive by experimental analysis.

Meeting details

- Mr. S. KARTHIKEYAN Mech Depart... and 14 more

SESSION:4

Fluid Flow Analysis using ANSYS-CFX

Dr.M.Ganesan,
Associate Professor,
Dept of Mech. Engineering,
Saranathan College of Engineering, Trichy.

Dr. G. Jayaprakash MECH HOD is presenting

Computational Fluid Dynamics

- It is a technique of modeling and simulation based on numerical modeling for fluid flow.
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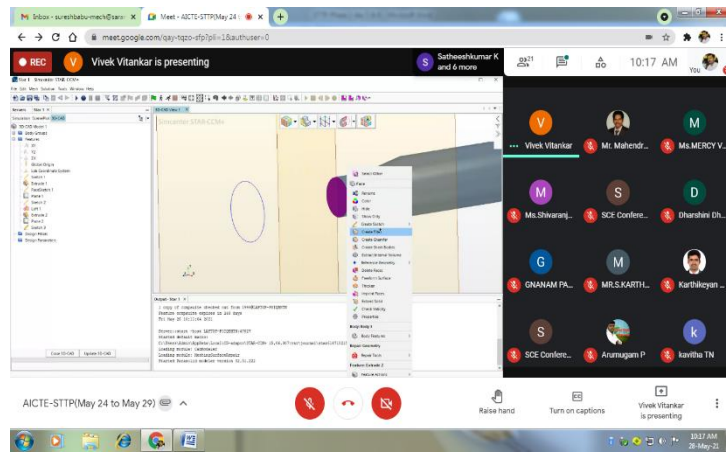
Meeting details

- Mr. S. KARTHIKEYAN Mech Depart... and 14 more

DAY 5: 28/05/2021

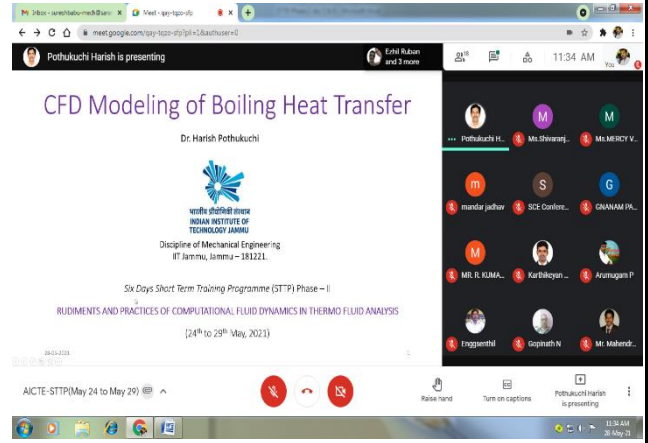
SESSION 1:

CFD Application: Software Demo
Dr Vivek Vittankar
Founder & Director of FluidDimensions,
Pune.



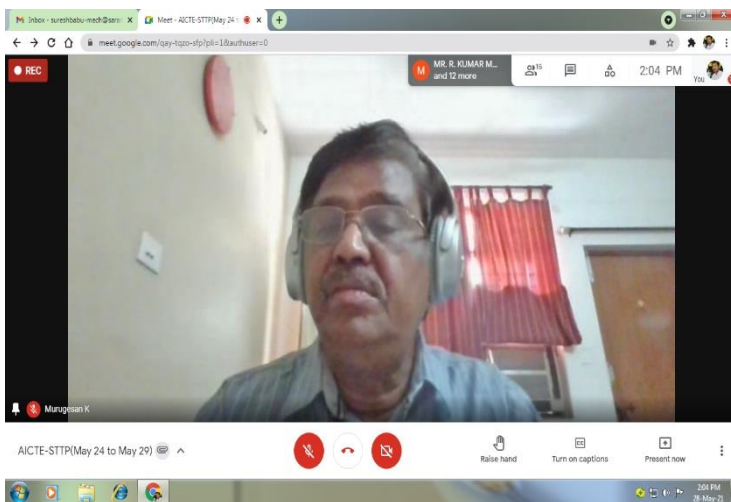
SESSION 2:

Modelling of boiling heat transfer
Dr.P.Harish
Assistant professor,
Dept. of Mechanical Engineering, IIT Jammu,
J& K.



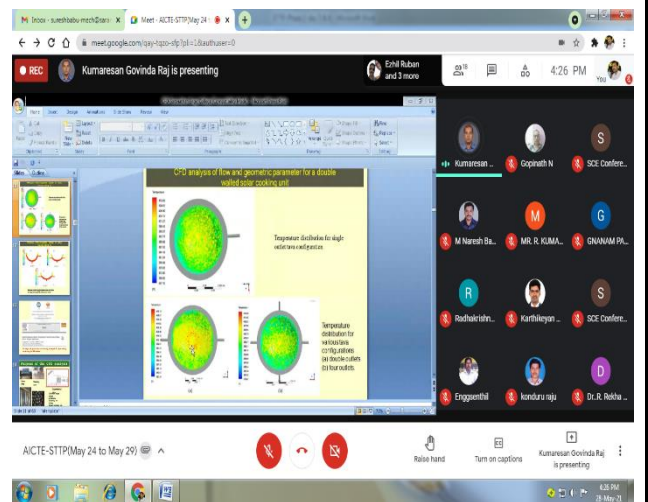
SESSION 3:

Computational Fluid Dynamics using Nanofluids by Velocity-Vorticity Equations
Dr.K.Murugesan,
Professor,
Dept.of Mechanical and Industrial Engineering,
IIT, Roorkee.



SESSION 4:

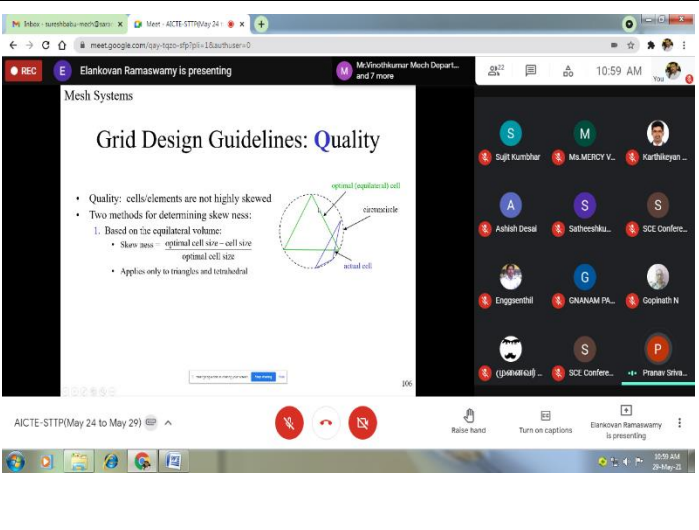
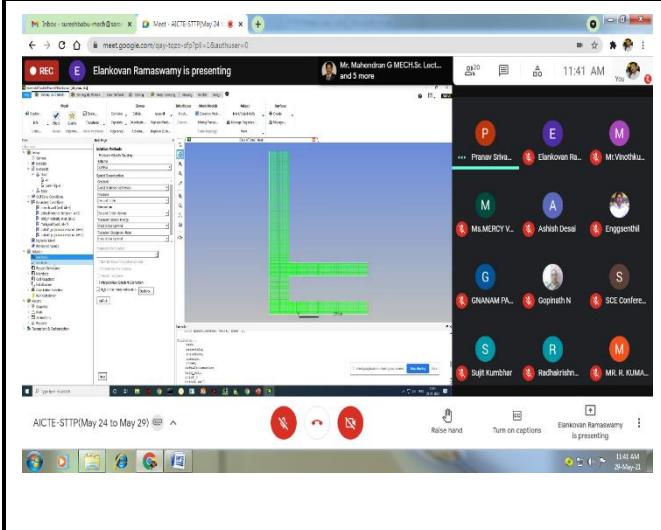
CFD Analysis of Thermal System Components
Prof. Dr. G. Kumaresan,
Associate Professor,
Institute of Energy Studies,
CEG,
Anna University, Chennai.



DAY 6: 29/05/2021

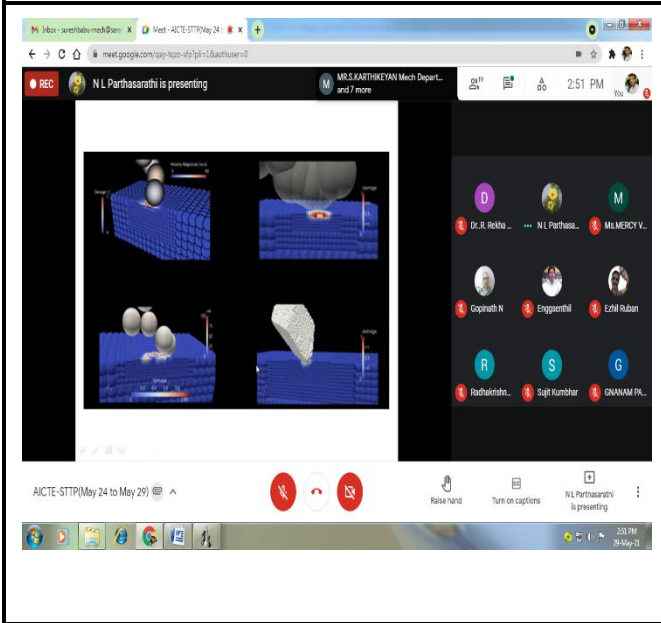
SESSION 1 & 2:

Grid Generation and Case studies on applications of CFD
Dr.R.Elangovan,
DGM (Commercial/Fossil Boilers),
B.H.E.L., Trichy



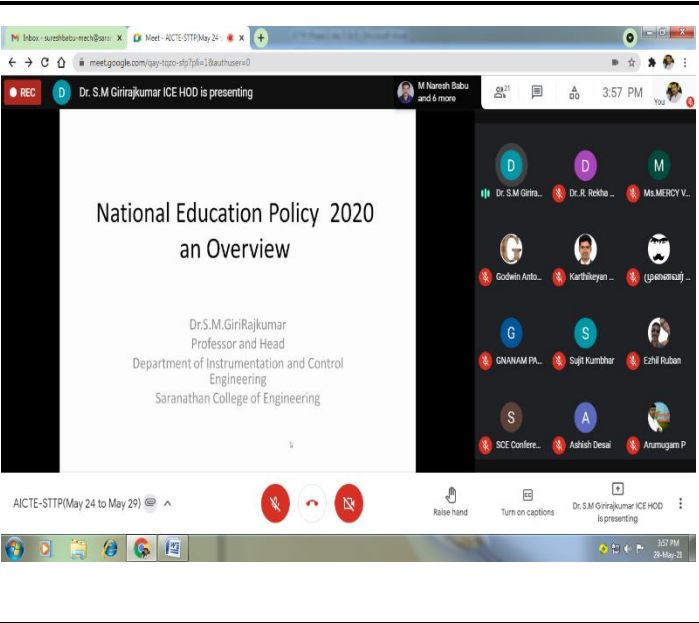
SESSION 3:

Application of CFD- A power plant perspective.
Dr. N.L.Parthasarathi,
Scientific Officer,
Metal Forming and Tribology Section,
IGCAR,Kalpakkam.



SESSION 4:

Valediction and talk on National Education Poilcy(NEP)
Dr. S.M.Giriraj Kumar,
Professor & Head,
Dept of ICE & Head (T & P),
Saranathan College of Engineering, Trichy.



ABOUT THE COLLEGE

Saranathan College of Engineering was founded in the year 1998 by "VidyaSevaRatnam", "Guru Seva Mani" Auditor Sri. K. Santhanam. The institution was so named in respectful memory of his Guru Prof. Saranathan, the then Principal of National College, Tiruchirappalli. Saranathan College of Engineering is a self-financing college approved by AICTE and affiliated to Anna University, Chennai for the UG courses it offers(Civil, CSE, EEE, ECE, IT, ICE and Mechanical Engineering). All the six (6) eligible UG branches are accredited by NBA, New Delhi. An enviable 'A+' rating by "NAAC" stands testimony to the commitment of the college to impart quality education.

ABOUT THE DEPARTMENT

The Department of Mechanical Engineering was started in the year 2005. The department offers an undergraduate programme B.E. in Mechanical Engineering and a postgraduate programme M.E. in Thermal Engineering. The department is accredited by NBA, New Delhi, since June 2018. The department is also a recognized research centre under Anna University, Chennai. The department has all of the following: state-of-the-art laboratories, CAD centre with advanced software, a department library, experienced and expert faculty members having doctoral degrees, outstanding research publications in peer reviewed International/National journals. The department's mission is to generate employable mechanical engineering graduates with knowledge, skills and ethics and provide them with the professional and soft skills necessary to lead a successful career and equip them with the confidence necessary to contribute positively to the society by performing in their respective chosen fields of endeavour.

PROGRAMME EVALUATION COMMITTEE (PEC)

PATRON:

Shri. S. Ravindran
Secretary

CHAIRPERSON:

Dr. D. Valavan
Principal

CO-CHAIRPERSON:

Dr. G. Jayaprakash
Professor & Head, Mechanical Engineering.

COORDINATOR:

Dr. N. Baskar
Professor, Mechanical Engineering

PEC MEMBER

Dr. C. Krishnakumar
Professor & Head, Department of Electrical and Electronics Engineering.

CO-COORDINATORS:

Dr. A. Mercy Vasan
Associate Professor, Mechanical Engineering
Dr. R. Rekha
Associate Professor, Mechanical Engineering

CONVENERS:

Dr. M. R. Anantha Padmanaban
Associate Professor, Mechanical Engineering
Dr. M. Ganesan
Associate Professor, Mechanical Engineering

ORGANIZERS:

Dr. G. Mahesh
Associate Professor, Mechanical Engineering
Mr. R. Suresh Babu
Assistant Professor, Mechanical Engineering
Mr. S. Sathyanarayanan
Assistant Professor, Mechanical Engineering

AICTE



Sponsored

*One-week Short Term Training Program
on*

***Rudiments and practices of
Computational Fluid Dynamics
in Thermo-fluid Analysis***

Phase I - 10.05.2021-15.05.2021

Phase II – 24.05.2021-29.05.2021



Organized by

***Department of Mechanical Engineering
Accredited by NBA, New Delhi***

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ENGINEERING**

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OBJECTIVES AND CONTEXT

- To provide a comprehensive training to engineers and researchers on application of CFD techniques over a broad range of applications like turbomachinery and multi-phase flows
- To familiarize the basic concepts, methods and mathematical equations controlling practical thermal and fluid flow phenomena
- To correlate theoretical and practical engineering usages of CFD through hands-on –training on various software packages
- To highlight the contemporary research trends in CFD and promote progressive research in product design and development

RELEVANCE

The short-term training programme is essential in the current scenario to facilitate researchers and engineers to adopt CFD as a standard practice in industry and research. With simulation techniques becoming a vital part of the design process in providing within the time constraints efficient solutions to thermal and fluid system, CFD has started playing a crucial role in product development cycle. The major obstacle, to the evolving of CFD from the stage of being a mere research tool to the stage of being used for real time applications in industries, is the lack of fundamental knowledge and high level of expertise in coding and software usage. This program aims to bridge that gap.

RESOURCE PERSONS

Experts from IITs, NITs, Anna University, DRDO, IGCAR, Industry, etc.

EXPECTED OUTCOMES

This program will enable the faculty, practising engineers and researchers

- ✓ To solve fundamental equations relating to fluid flow and heat transfer problems
- ✓ To acquire software computing skills in CFD and interpret results to make design decisions
- ✓ To forecast implications of design changes and optimize a design, based on CFD results, with an aim to create quality product development and to carry out virtual experimentation on complicated prototypes

TOPICS OF INTEREST

- Fundamental knowledge in theory and concepts of Computational Fluid Dynamics
- Hands on training on modern CFD software tools for solving Thermo-fluid problems
- Industrial visits to understand the significance of CFD applications in solving real time industrial flow problems

EXPECTED SKILLS AND SUGGESTED FURTHER ACTIONS

- Fundamental knowledge in theory and concepts of Computational Fluid Dynamics
- Industrial visits to understand the significance of CFD applications in solving real time industrial flow problems

COURSE DURATION

Each STTP is for a duration of 6 days and will be held online through Google meet. For an effective utilization of the program and to become eligible for the e-certificate attendance on all the days is important. Based on their convenience participants can choose to attend any one of the phases of STTP listed.

REGISTRATION

Registration is based on first come first served basis. Google Meet link will be provided by E-Mail, to the selected participants only.

NO REGISTRATION FEE.

Registration Link :

<https://forms.gle/NFq498upV8vgsxVTA>



CONDUCT OF TEST AND ISSUANCE OF CERTIFICATE

All the participants have to appear for a test at end of the program. E-Certificates will be issued only to those participants who have attended the program on all the days and have qualified in the evaluation test.

IMPORTANT DATES

Last date of Receipt Application: 04-05-2021
(Google form)

Intimation to Selected Participants: 05-05-2021
(Mail)

ADDRESS FOR CORRESPONDENCE

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Department of Mechanical Engineering
Saranathan College of Engineering, Panjappur, Tiruchirappalli,
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