

# CHHOTUBHAI GOPALBHAI PATEL INSTITUTE OF TECHNOLOGY

## Department of Automobile & Mechanical Engineering

### A Report of two days' workshop

#### On

### “COMPUTER AIDED THERMAL FLUID SYSTEM ANALYSIS”

<b>Title of the workshop</b>	Computer Aided Thermal Fluid System Analysis
<b>Organizing Department</b>	Automobile & Mechanical Engineering
<b>Chief Patron</b>	Dr. D R Shah, Provost, UTU
<b>Patron</b>	Dr. N C Shah, Director, CGPIT
<b>Convenor</b>	Dr. C K Desai, Professor, HOD, MED, CGPIT
<b>Organizing Secretary</b>	Mr. H A Shah, Assistant Professor, MED, CGPIT Mr. J J Topiwala, Assistant Professor, MED, CGPIT
<b>Organizing Committee</b>	Mrs. Mary Florence, Assistant Professor, MED, CGPIT Mr. Gaurav Gadhesaria, Assistant Professor, MED, CGPIT Mr. Keyur Surti, Assistant Professor, MED, CGPIT Mr. Kapil Gohil, Assistant Professor, MED, CGPIT Mr. Soyeb Multani, Assistant Professor, MED, CGPIT Mr. Manish Maisuria, Assistant Professor, MED, CGPIT Mr. Krunal Parmar, Assistant Professor, MED, CGPIT Mr. Dhaval Patel, Assistant Professor, MED, CGPIT
<b>Targeted Audience</b>	PG Students, Research Scholars, Faculty Members, Industrial Persons
<b>No of Participants</b>	PG Students: 37 Research Scholars: 02 Faculty members: 28 Total: 67
<b>Date of Event</b>	3 <sup>rd</sup> & 4 <sup>th</sup> October, 2016
<b>Invited Speakers</b>	Dr. S A Channiwala, Professor, SVNIT, Surat Dr. J R Patel, Assistant Professor, PDPU, Gandhinagar Dr. A R Patel, Associate Professor, MSU, Baroda Dr. R D Shah, Assistant Professor, SVNIT, Surat Dr. M K Rathod, Assistant Professor, SVNIT, Surat Dr. C K Desai, Professor, UTU, Bardoli

## Schedule of Workshop

Timing	Day 1 - 3/10/2016	Venue
9:15 am to 10:00 am	Registration with High Tea	Foyer of P T Auditorium
10:00 am to 10:30 am	Inaugural Ceremony	P T Auditorium
10:30 am to 12:00 noon	SESSION 1: Dr. S A Channiwala (SVNIT) (Understanding Welding and its Simulation)	P T Auditorium
12:00 noon to 12:45 pm	Lunch Break	Boys' Hostel Mess
12:45 pm to 02:15 pm	SESSION 2: Dr. Jatin Patel (PDPU) (Introduction to Engineering Equation Solver)	B 203, CGPIT
02:15 pm to 02:30 pm	Tea Break	Foyer of B 203, CGPIT
02:30 pm to 04:00 pm	SESSION 3: Dr. Amit Patel (MSU) (Experiment on Thermo-Fluid Analysis on Spiral Tube Heat Exchanger using MATLAB)	B 203, CGPIT

Timing	Day 2 - 4/10/2016	Venue
9:00 am to 9:30 am	High Tea	Foyer of B 203, CGPIT
9:30 am to 11:00 am	SESSION 1: Dr. R D Shah (SVNIT) (Numerical Solution of 2D Laplace Equation using Microsoft Excel)	B 203, CGPIT
11:00 am to 11:10 am	Tea Break	Foyer of B 203, CGPIT
11:10 am to 12:40 pm	SESSION 2: Dr. M K Rathod (SVNIT) (Numerical Analysis of Melting & Solidification Process)	B 203, CGPIT
12:40 pm to 1:40 pm	Lunch Break	Boys' Hostel Mess
1:40 pm to 3:10 pm	SESSION 3: Dr. C K Desai (CGPIT) (Introduction to Physical Modelling for thermal fluid system using MODELICA)	B 203, CGPIT
3:10 pm to 3:30 pm	Valedictory Function	B 203, CGPIT

## **Details of the workshop:**

Department of Automobile/Mechanical Engineering of CGPIT has organized two days' workshop on "Computer Aided Thermal Fluid System Analysis (CATFSA)" sponsored by Uka Tarsadia University.

The workshop was started by UTU anthem followed by lamp lighting to seek the blessings of almighty. As per tradition of CGPIT, all the dignitaries were given a warm welcome and were felicitated to express respect and gratitude towards them for devoting their valuable time and gracing the workshop. The dignitaries that graced the inauguration ceremony of workshop were Dr. N. C. Shah (Director, CGPIT), Dr. C. K. Desai (HOD, Auto/Mech. Dept.) and head of other departments of CGPIT. Along with the dignitaries, our experts were also felicitated by the organizing secretaries of the workshop.

Honourable Director of CGPIT, Dr. N.C. Shah sir gave the welcome speech. He motivated the students and faculties for participating in technical events like short term training program, workshop, expert talk, etc. He congratulated the Auto/Mech. department for organizing such workshop. He also appreciated the efforts made by faculties of Auto/Mech. department with the great coordination. Dr. Chinmay K. Desai, Head of Department, Mechanical and Automobile Engineering gave brief introduction about the workshop. Technical session was proceeded after inaugural ceremony

## **Session Detail:**

### **Day 1:**

#### **Session 1: Understanding Welding and its Simulation. (Hands on Session)**

- In this session, Dr. S A Channiwala initiated lecture by sharing his views about Welding Process, its classification and application in industry. He explained the modelling of Welding process using different Heat source model. Further, he brief out the 1D mathematical modelling of welding process and applied Finite Difference method for 1D, 2D & 3D temperature grid. At the end as a part of better understanding he gave a tutorial on Thermal analysis on 1D Welding Process and made participant understood of how they can solve it. Finally, Dr. S A Channiwala has end up his lecture by wonderfully motivating all the participant to go for energy saving by planting more and more trees to have better human comfort.

### **Session 2: Thermal System Analysis using Engineering Equation Solver (Hands on Session)**

- In this session, Dr. Jatin Patel gave basic introduction and various important features to computing capabilities in engineering using Engineering Equation Solver (EES) software. After that, he carried out hands on session of formatting equations, writing constants-units and utilising built in functions in EES. He explained the EES with the help of ideal Rankine cycle.

### **Session 3: Spiral Flow Heat Exchanger: Understanding its need and obtaining its correlations**

- In this session, Dr. Amit Patel started his talk by exploring the present energy consumption scenario in various fields and emphasised on utilisation of biomass energy. Next, he explained design, thermal analysis and experimental setup of HAG - swirl type heat exchanger system for drying application. He brief out the concept of entropy generation during heat exchange process, mathematical model of entropy generation and graphically shown the optimum heat input, swirl pitch and mass flow rate.

## **Day 2:**

### **Session 1: Numerical Solution of 2D Laplace Equation using Microsoft Excel. (Hands on Session)**

- In this session, Dr. Rupesh Shah explained and conducted hand on experience on how to solve 2D Laplace equation using Finite Element method with the help of Microsoft Excel tool. He also brief out the same methodology with different grid size and shown comparison of all the results.

### **Session 2: Mathematical Modelling & Solution of Enthalpy Based Phase Change Problem**

- In this session, Dr. Manish Rathod emphasised on why thermal energy storage are required. He gave information on properties of PCM and its applications. He also explained thermal modelling of PCM, enthalpy formulation by explicit finite volume methodology.

### **Session 3: Introduction to Physical Modelling for thermal fluid system using MODELICA (Hands on Session)**

- In this session, Dr. Chinmay Desai explained the objective of physical modelling and characteristics of the thermal fluid system. Then he started with making aware of using different computer tools such as Matlab, CFD, EES, Scilab etc. and from this he

concluded for using Modelica tool for Physical Modelling of system. He brief out all the features of this tool and took application of Newton's law of cooling to understand in detail.

**Glimpses of the Workshop:**



**Inauguration & Lamp lighting Ceremony**



@CGPIT\_ Photography Te



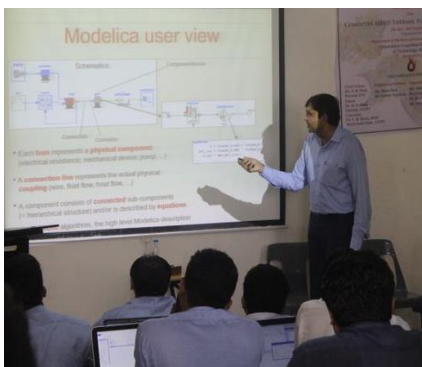
@CGPIT



**Welcoming the Dignitaries**



**Technical Sessions**



**Hands on Sessions**



**Valedictory function – Feedback from participants**



**Valedictory function – Certificate distribution**

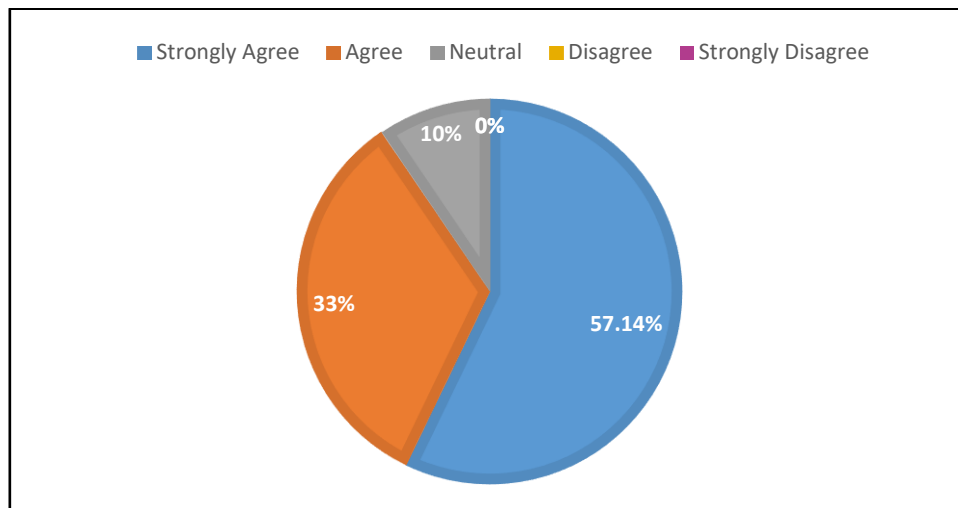




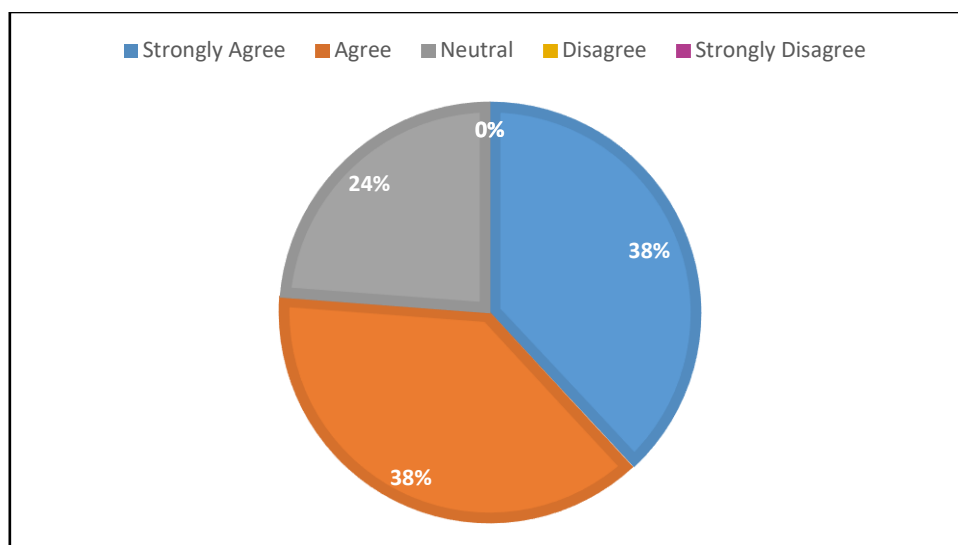
**Organising Team**

**Feedback Analysis:**

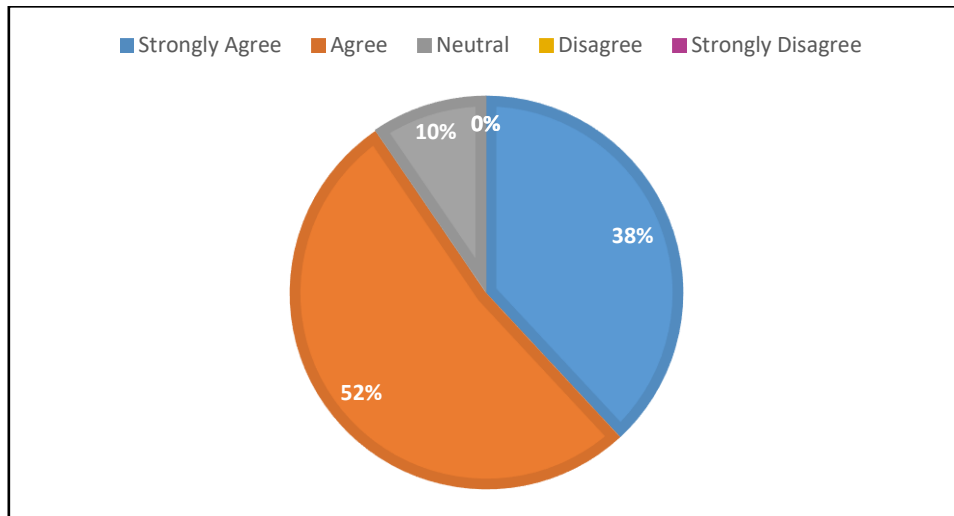
**1. The course met its stated aim and objective.**



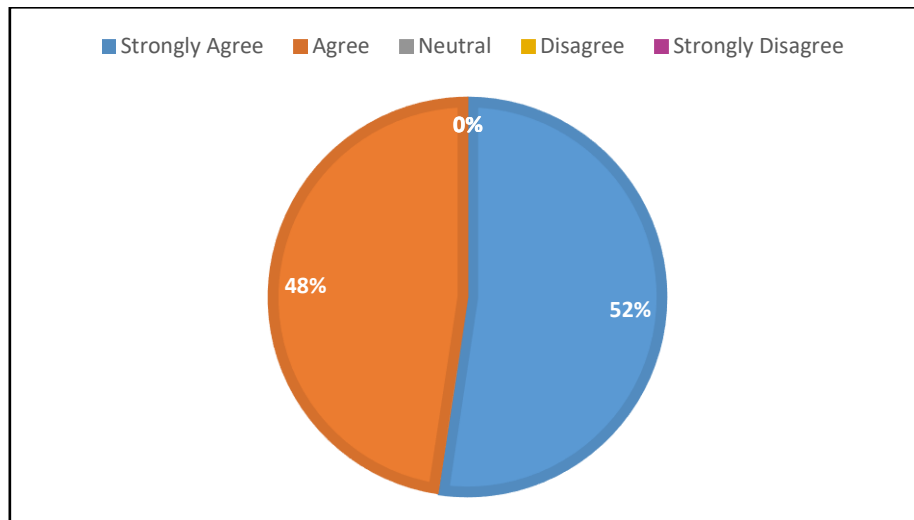
**2. The material was presented in a clear and organized manner.**



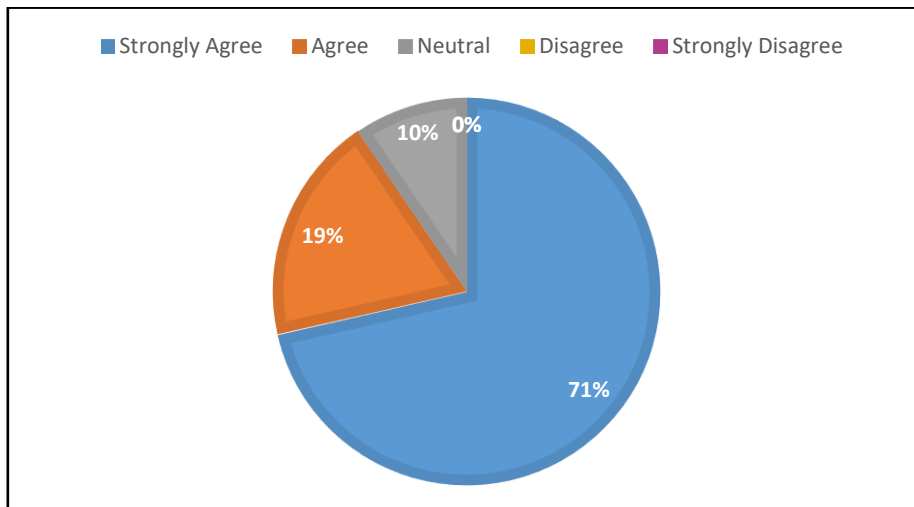
**3. The event was schedule at a suitable time.**



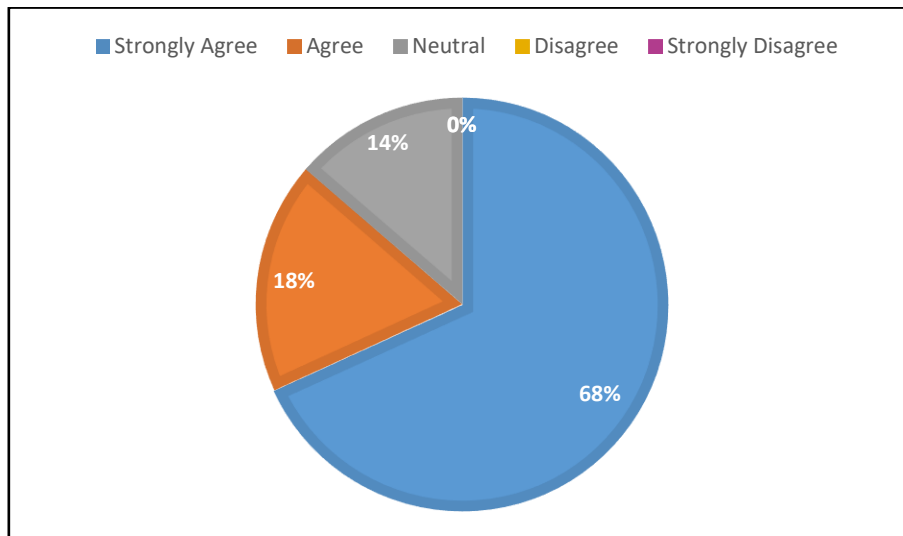
**4. The event facilities were appropriate and satisfactory.**



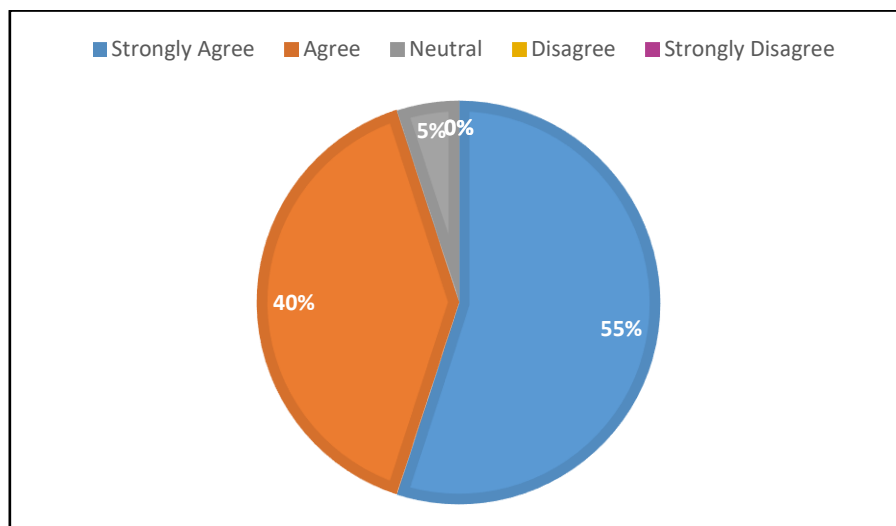
**5. The Trainers were well prepared.**



**6. The trainer responded to the question in an informative, appropriate and satisfactory manner.**



**7. Overall the session was informative and valuable.**



➤ **Valuable suggestions given by participants:-**

- Organize such a knowledge sharing workshop in a regular interval.
- Time duration should be more.
- Content should be design based.
- Required more hands on practice.