

A Report on  
One week Faculty Development Programme (FDP)  
Advances in Heating Ventilation Air-conditioning and  
Refrigeration (HVAC&R)

Date: 14<sup>th</sup> -19<sup>th</sup> October, 2019 | Venue: Seminar Hall

**ORGANIZING COMMITTEE**

**CHIEF PATRON**  
**Dr. R. K. Gajjar,**  
**Principal**



**COORDINATORS**  
**Dr N M Bhatt**  
**Professor and Head**  
**Dr R G Kapadia**  
**Professor**

**CO-COORDINATORS**  
**PROF. H.A. Shukla**  
**PROF G.N. Sutaria**



**ISTE GUJARAT SECTION**  
**Prof. K. M. Bhavsar**                      **Prof. N. K. Patel**  
**Chairman**                                      **Secretary**

## ISTE-GTU approved one week FDP on Advances in Heating Ventilation Air-conditioning and Refrigeration (HVAC&R)

### ABOUT LDCE

**L D College of Engineering** was started in the year 1948 with the vision to emerge as a ‘center for excellence’ offering technical education and research advancement of society and humankind. We dedicate and commit ourselves to achieve, sustain and foster unmatched excellence in Technical Education. The Institute also offers post graduate programmes in Mechanical Engineering and Computer Engineering to develop scientific and engineering manpower. The programmes are designed to include courses of study, seminars and project/thesis through which a student may develop his/her concepts and intellectual skills. To, this end, we will pursue continuous development of infrastructure and enhance state-of-the art equipment to provide our students a technologically up-to-date and intellectually inspiring environment of learning, research, creativity, innovation and professional activity and inculcate in them ethical and moral values.

### ABOUT MECHANICAL ENGINEERING DEPARTMENT

MED offers B.E. in Mechanical & Automobile Engineering and M.E in CAD/CAM, Cryogenics and IC/Automobile Engineering. The department has highly qualified faculty members, state of the art laboratories and infrastructures. Under Siemens center of excellence (CoE) various state of the art laboratory facilities are available such as for Rapid Prototyping (RP) lab, CIM Lab, Process Instrumentation lab, MCMT lab, Automation Lab., Mechatronics Lab., Product design & validation Lab. and Advanced Mfg. Lab. Apart from this Govt. of Gujarat approved CoE of Welding Technology has also been established..

### ABOUT FDP

HVAC & R is no longer remained a luxurious commodity for the people of modern India. Therefore, it is becoming one of the key building blocks in modern infrastructure. According to Acrex India 2019 report on “Opportunities in India” states that India is emerging as a manufacturing hub for HVAC industry. The Indian HVAC market is projected to exhibit a CAGR of 9.86%, in value terms, during 2017-2022. However, this sector is energy intensive and it comprises 40 percent of the energy consumed by buildings in India. Besides this, the HVAC & R also responsible for harmful effect on the ozone layer and global climate change.

### OBJECTIVES OF THE PROGRAMME

- Identify the challenges and opportunities in the HVAC & R Industry
- Evaluate recent advances in HVAC & R Technology
- Select newer potential areas of research in HVAC&R

### ABOUT PARTICIPANTS

There were total 31 participants from various engineering institution across Gujarat which are AICTE approved institutions and affiliated to GTU.

L D College of Engineering  
Mechanical Engineering Department  
GTU ISTE FDP on Advances in HVAC&R (14/10/2019 to 19/10/2019)  
Profile of the Speakers

Sr. No.	Details
1.	Name: Mr Kamlesh Mehta Designation: Chairman and Managing Director, Citizen Industries Ltd., Ahmedabad Topic: Current Scenario and Opportunities in HVAC&R (Keynote Address) Email: corporate@citizenindia.com
2.	Name: Mr. Dilip Sarda Designation: Chairman and Managing Director, Synergy Agro-Tech Pvt. Ltd. Ahmedabad Topic: Recent Trends in Cold Chain Email: synergyagrotech@gmail.com
3.	Name: Mr. Shailendra Vyas Designation: HVAC MEP Consultant, Ahmedabad Topic: HVAC&R Components Email: svyas.ae@gmail.com
4.	Name: Mr Yash Kumar Shukla Designation: Associate Professor, CEPT University, Ahmedabad Topic: Net Zero Energy Building Email: yash.shukla@cept.ac.in
5.	Name: Mr. M. M. Shah Designation: HVAC Consulting Engineer, Ahmedabad Topic: Advanced Psychrometry Email:
6.	Name: Mr. Dipak Pandya Designation: Motivational Speaker Topic: Enrich Leader within You Email: deeppandya1961@yahoo.com
7.	Name: Mr. Gaurav Patel Designation: Scientist, Gujarat Energy Research and Management Institute (GERMI) Gandhinagar Topic: Types of HVAC system and District Cooling System Email: Gaurav.P@germi.res.in
8.	Name: Mr. Sunil Bhatia Designation: HVAC Consultant, Director, HVAV Green Tech Ltd. Ahmedabad, Member CWC ISHRAE Ahmedabad Chapter Topic: Air Conditioning Load calculations Email: hvacgreentech@gmail.com
9.	Name: Dr S. S. Kachhawaha Designation: Professor of Mechanical Engineering, School of Technology, PDPU, Gandhinagar Topic: Hybrid VCR-VAR system Email: surendra.singh@sot.pdpu.ac.in
10.	Name: Dr N M Bhatt Designation: Professor and Head, Mechanical Engineering Department, L. D. College of Engineering, Ahmedabad

	Topic: (1) Methods of Refrigeration (2) R1234yf as substitute to R134a in Domestic Refrigerator Email: nmbhatt19@gmail.com
11.	Name: Dr S. M. Mehta Designation: Professor and Head, Mechanical Engineering Department, GEC, Bhavnagar Topic: Thermo acoustic Refrigeration Email: shreya74@gmail.com
12.	Name: Dr R. G. Kapdia Designation: Professor, Mechanical Engineering Department, L. D. College of Engineering, Ahmedabad Topic: Recent Trends in Cold Chain Email: rag260475@gmail.com
13.	Name: Dr J. R. Mehta Designation: Associate Professor, Mechanical Engineering Department, Faculty of Engineering and Technology, M. S. University Baroda Topic: (1) Energy and Air-conditioning (2) Solar Heating and Cooling Email: jrmehta1999@gmail.com
14.	Name: Dr Dileep Kumar Gupta Designation: Associate Professor, IITRAM, Ahmedabad Topic: CO <sub>2</sub> Refrigeration Email: dileepkumar@iitram.ac.in

L D College of Engineering  
Mechanical Engineering Department  
Schedule of GTU ISTE FDP on HVAC&R

Day		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Date		14/10/2019	15/10/2019	16/10/2019	17/10/2019	18/10/2019	19/10/2019
Session 1	10:30 am to 12:00 am	Inaugural Function	Advanced Psychrometry  Mr M M Shah	Air Conditioning Load calculations  Mr Sunil Bhatia  HVAC Consultant	Energy and Air-conditioning  Dr J R Mehta  MS University, Baroda	Hybrid VCR-VAR system  Dr S S Kachhawaha	Solar Air conditioning system  Mr Gaurav Patel, GERMI
Session 2	12:00 am to 1:30pm	Keynote Address on Current Scenario and Opportunities in HVAC&R  Mr Kamlesh Mehta  Citizen Industries Ltd.	Net Zero Energy Building  Dr Yash Kumar Shukla	Duct Design  Prof. H. A. Shukla	Solar Heating and Cooling  Dr J R Mehta  MS University, Baroda	Recent Trends in Cold Chain  Mr Dilip Sarda	Types of HVAC system and District Cooling System  Mr Gaurang Patel  GIFT City
Lunch Break 1:30 pm to 2:30 pm							
Session 3	2:30 pm to 4:00 pm	Methods of Refrigeration  Dr N M Bhatt  LDCE	R1234yf as substitute to R134a in Domestic Refrigerator  Dr N M Bhatt  LDCE	Enrich Leader within You  Mr. Dipak Pandya	Thermo acoustic Refrigeration  Dr S M Mehta	Visit of Synergy Agro-Tech Pvt. Ltd.	VCR Cycle Simulation  Dr R G Kapadia  LDCE
Session 4	4:00 pm to 5:30 pm	Alternate Refrigerants  Dr R G Kapadia  LDCE	HVAC&R Components  Mr Shailendra Vyas  HVAC Consultant	Enrich Leader within You  Mr. Dipak Pandya	CO <sub>2</sub> Refrigeration  Dr Deelip Kumar Gupta, IITRAM	Visit of Synergy Agro-Tech Pvt. Ltd.	Test and Valedictory Function

## INAUGURAL SESSION

- ❖ Subject: Advances in Heating , Ventilation, Air Conditioning and Refrigeration (HVAC & R)
  - ❖ Venue: Seminar Hall, Transportation Engineering, Civil Engineering Dept., L D College of Engg. Navarangpura, Ahmedabad.
  - ❖ Date: 14<sup>th</sup> Oct 2019
  - ❖ Participants: More than 30 participants attended this programme.
- ❖ Indian Society of Technical Education (ISTE) approved and Gujarat Technological University (GTU) sponsored one week FDP on Advances in Heating, Ventilation, Air Conditioning and Refrigeration (HVAC & R) was organized by Mechanical Engineering Department of L D College of Engineering, Ahmedabad with Technical Supported by ISHRAE Ahmedabad Student Chapter – LDCE during 14<sup>th</sup> Oct 2019 to 19<sup>th</sup> October 2019.



- ❖ Program Started with Lighting of lap & followed by Prayer.



- ❖ Dr. R K Gajjar (Principal LDCE), Mr. Kamalesh Mehta ( Chief Guest, Past President IAC), Mr. Ashok Patel ( Guest of Honor, Past President IAC) & Mr. Shailendra Vyas ( Guest of Honor and Current President IAC) Dr N M Bhatt ( Coordinator and HOD- Mech. Dept. LDCE), Dr. Ragesh Kapadia (Professor Mech. LDCE), were present at the inaugural function of the Program.



- Inaugural speech given Dr. R K Gupta (Principal - LDCE)



➤ Welcome Speech given by Dr. N M Bhatt (HOD – Mechanical Dept. LDCE).



➤ Chief Guest Address given by Mr. Kamalesh Mehta





➤ Gujarat Newspaper Coverage

## Glimpses of the Program



- ❖ Mr. Kamallesh Mehta had delivered technical session on “Current Scenario and Opportunities in HVAC & R”.



- Dr. R K Gupta (Principal LDCE) gave memento to Mr. Kamallesh Mehta after the completion of technical session.



- Dr. N M Bhatt (HOD – Mechanical Dept. LDCE) had delivered technical session on “Method of Refrigeration”.



- Dr. Ragesh Kapadia had delivered technical session on “Alternate Refrigerants”.



- ❖ **Topic:** Expert Lecture on “Advanced Psychrometric” by Mr. Mukesh M Shah
- ❖ **Date:** 15<sup>th</sup> Oct 2019 from 10.30 am to 12.00 am.



- ❖ Mr. Mukesh M Shah had delivered expert lecture on “Advanced Psychrometric”.



- ❖ **Topic:** Expert Lecture on "Net Zero Energy Building" by Dr. Yash Shukla
- ❖ **Date:** 15<sup>th</sup> Oct 2019 from 12.00 noon to 1.30 pm.



- ❖ **Topic:** Expert Lecture on “Heat Load Estimation” by Mr. Sunil Bhatia
- ❖ **Date:** 15<sup>th</sup> Oct 2019 from 2.30 pm to 4.00 pm.



- ❖ Mr. Sunil Bhatia had delivered expert lecture on “Heat Load Estimation”.

- ❖ **Topic:** Technical Talk on “Recent Trends in Components of Air-conditioning Systems” by Mr. Shailendra Vyas
- ❖ **Date:** 15<sup>th</sup> Oct 2019 from 4.00 pm to 5.30 pm.



- ❖ Mr. Shailendra Vyas had delivered expert lecture on “Recent Trends in Components of Air-conditioning Systems”.

- ❖ **Topics:** Expert Lecture on “R1234yf as Substitute to R134a in Domestic Refrigerator” by Dr N M Bhatt
- ❖ Expert Lecture on “Duct Design” by Prof. Hardik Shukla
- ❖ Expert Session on “Enrich Leader within you” by Mr. Deepak Pandya
- ❖ **Date:** 16<sup>th</sup> Oct 2019 from 10.30 am to 5.30 pm.



- ❖ Dr. N M Bhatt had delivered expert lecture on “R1234yf as Substitute to R134a in Domestic Refrigerator”.





❖ Prof. Hardik Shukla had delivered expert lecture on “Duct Design”.



❖ Mr. Deepak Pandya had delivered expert lecture on “Enrich Leader within you”.

- ❖ **Topic:** Expert Lecture on “Desiccant Cooling” by Dr. J R Mehta
- ❖ **Date:** 17<sup>th</sup> Oct 2019 from 10.30 am to 1.30 pm.



- ❖ Dr. J R Mehta had delivered expert lecture on “Desiccant Cooling”.

- ❖ **Topic:** Expert Lecture on “Thermo Acoustic Refrigeration” by Dr. S M Mehta
- ❖ **Date:** 17<sup>th</sup> Oct 2019 from 2.30 pm to 4.00 pm.



- ❖ Dr. Shreya Mehta had delivered expert lecture on “Thermo Acoustic Refrigeration”.

- ❖ **Topic:** Technical Talk on “CO<sub>2</sub> Refrigeration” By Dr. Deelip kumar Gupta
- ❖ **Date:** 17<sup>th</sup> Oct 2019 from 4.00 pm to 5.30 pm.



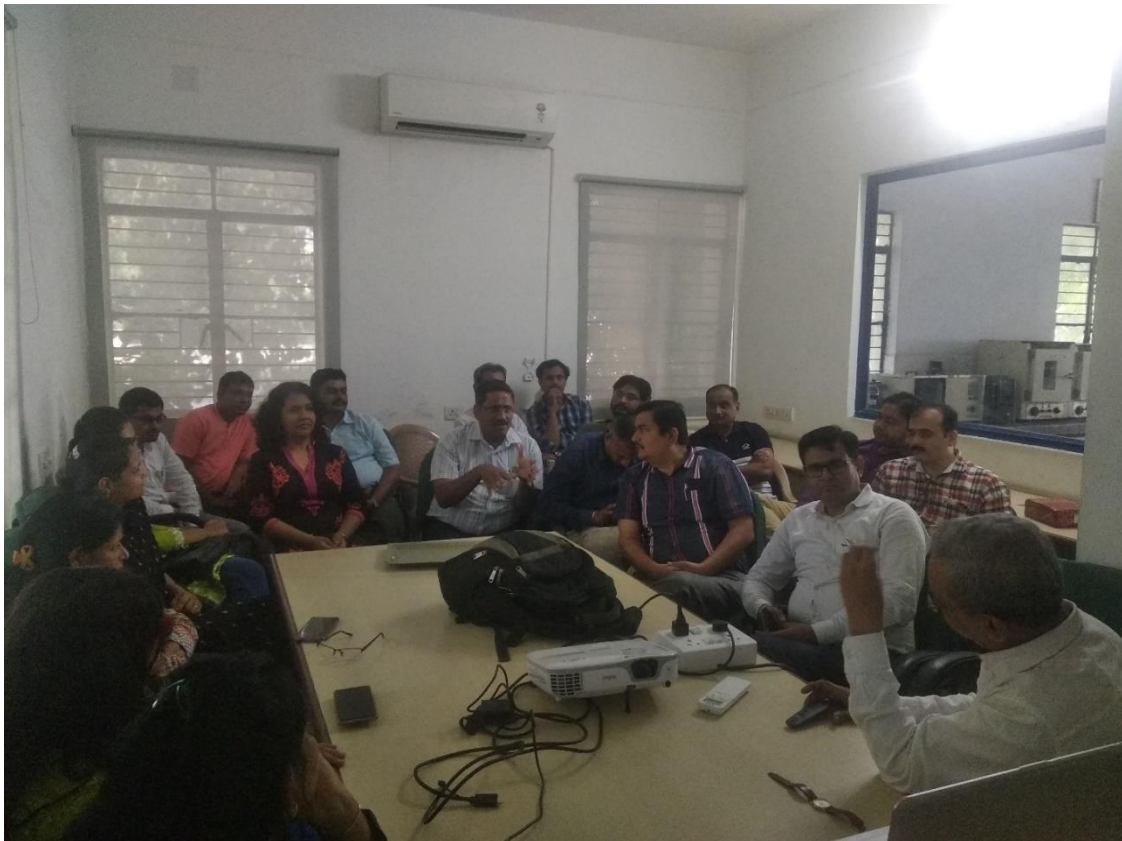
- ❖ Dr. Deelip Kumar Gupta had delivered expert lecture on “CO<sub>2</sub> Refrigeration”.

- ❖ **Topic:** Technical Talk on “Hybrid VCR-VAR System” By Dr. S S Kachhawaha
- ❖ **Date:** 18<sup>th</sup> Oct 2019 from 10.30 am to 12.00 am.



- ❖ Dr. S S Kachhawaha had delivered expert lecture on “Hybrid VCR-VAR System”.

- ❖ **Topic:** Technical Talk on “Recent Trends in Cold Chain” By Mr. Dilip Sardar
- ❖ **Venue:** Plot No 470/1 Bhagyalaxmi Estate, Sola Santej Road, Village: Rakanpur, Near Manpasand Weigh Bridge, Dist. Gandhinagar, Kalol, Gujarat - 382721
- ❖ **Date:** 18<sup>th</sup> Oct 2019 from 12.00 am to 1.30 pm.



- ❖ Mr. Dilip Sardar had delivered expert lecture on “Recent Trends in Cold Chain”.

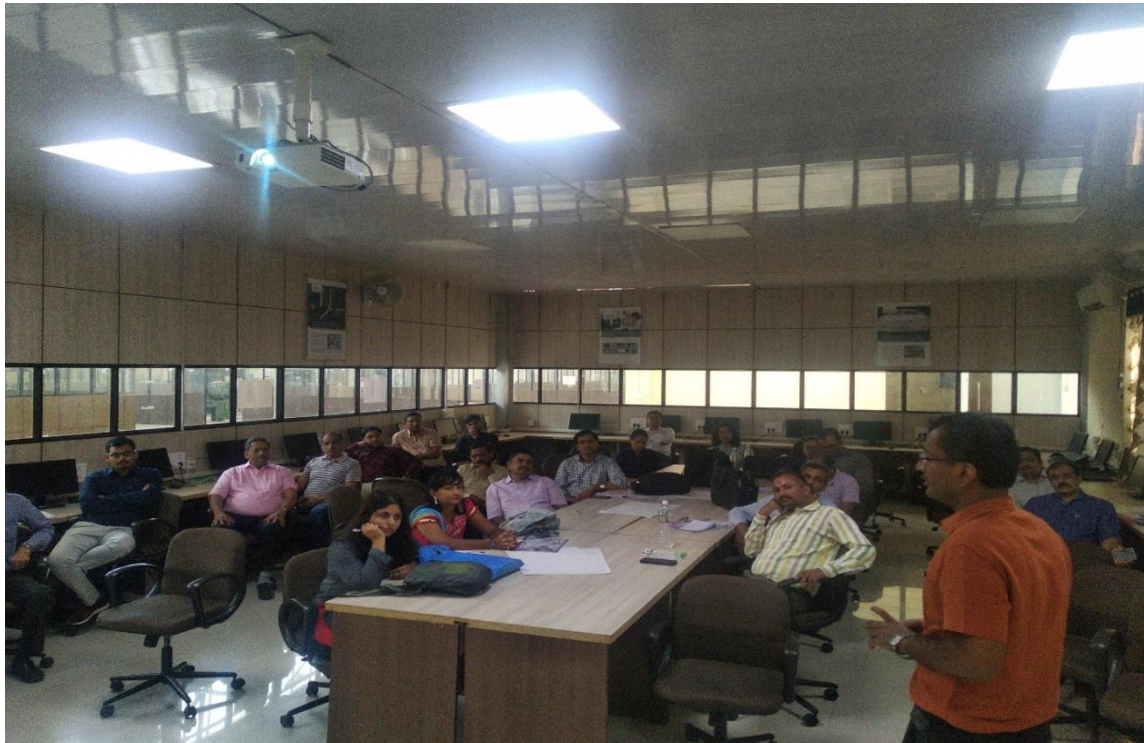
- ❖ **Topic:** Industrial Visit
- ❖ **Venue:** Plot No 470/1 Bhagyalaxmi Estate, Sola Santej Road, Village: Rakanpur, Near Manpasand Weigh Bridge, Dist. Gandhinagar, Kalol, Gujarat - 382721
- ❖ **Date:** 18<sup>th</sup> Oct 2019 from 2.30 pm to 4:00 pm.



- ❖ Mr. Harshal Sarda & Mr. Ameet Kaila (M/s. Synergy Agro tech Pvt Ltd.) and Prof. Hardik Shukla assisted to organize & conduct the visit.



- ❖ **Topic:** Technical Talk on “Solar Air-conditioning System” By Mr. Gaurav Patel
- ❖ **Date:** 19<sup>th</sup> Oct 2019 from 12.00 am to 1.30 pm.



- ❖ Mr. Gaurav Patel had delivered expert lecture on “Solar Air-conditioning System”.

- ❖ **Topic:** Expert Lecture on “Solid Desiccant Assisted Hybrid Air-conditioning System” by Mr. D B Jani
- ❖ **Date:** 19<sup>th</sup> Oct 2019 from 12.00 am to 1.30 pm.



- ❖ Mr. D B Jani had delivered expert lecture on “Solid Desiccant Assisted Hybrid Air-conditioning System”.

- ❖ **Topic:** Expert Lecture on “VCR Cycle Simulation” By Dr. Ragesh Kapadia
- ❖ **Date:** 19<sup>th</sup> Oct 2019 from 2.30 pm to 4.00 pm.



- ❖ Dr. Ragesh Kapadia had delivered expert lecture on “VCR Cycle Simulation”.



## ISTE-GTU-FDP

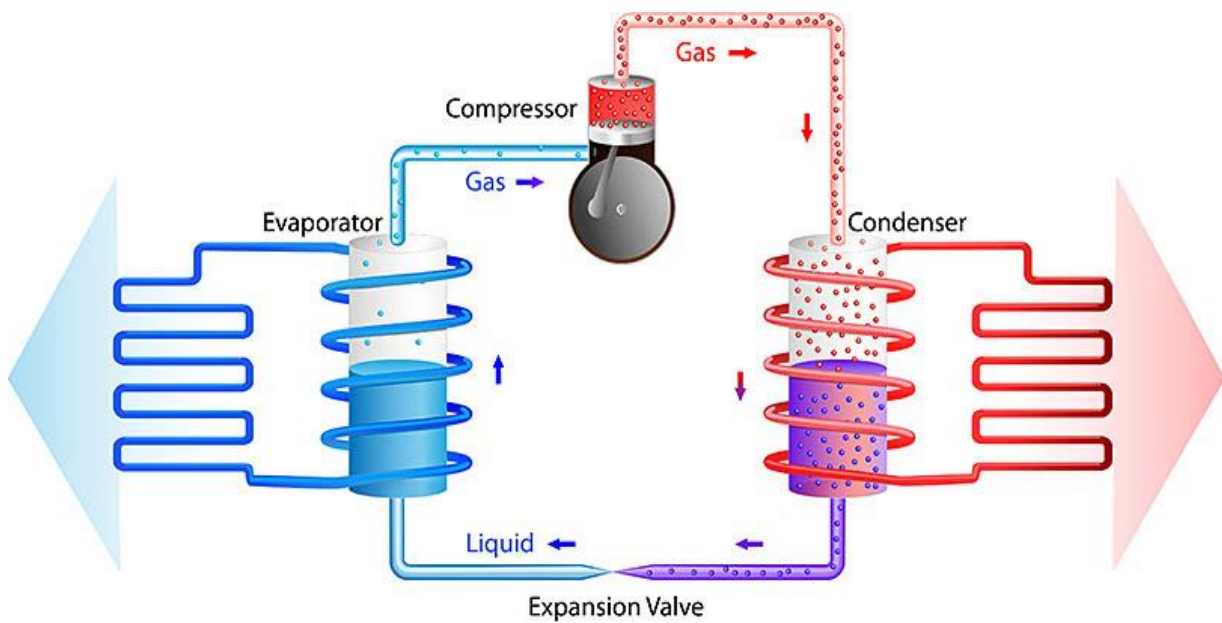
GTU sponsored and ISTE Approved

One week Faculty Development Programme (FDP)

on

ADVANCES IN HEATING, VENTILATION, AIR-CONDITIONING AND  
REFRIGERATION (HVAC & R)

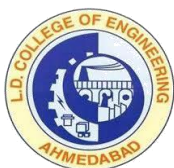
October 14 – 19, 2019



COORDINATORS

Dr N M Bhatt

Dr R G Kapadia



ORGANIZED BY  
DEPARTMENT OF MECHANICAL ENGINEERING

*L. D. COLLEGE OF ENGINEERING*

AHMEDABAD-GUJARAT, INDIA

Email: [head\\_mechanical@ldce.ac.in](mailto:head_mechanical@ldce.ac.in)

Website: [www.ldce.ac.in](http://www.ldce.ac.in)

