

# GOVERNMENT ENGINEERING COLLEGE MODASA



**ELECTRICAL DEPARTMENT**

2018

# ELECTROZINE

MAGAZINE BY ;  
THE DEPARTMENT  
OF ELECTRICAL  
ENGINEERING

**IDEATION**

**INNOVATION**



**PEACE BE AMPLIFIED,  
WORLD BE RECTIFIED**



THINK GREEN

# TEAM ELECTROZINE



**SHAGUN  
TRIPATHI**



**SAGAR  
RASHILABEN  
GOHIL**



**VINZAVA  
PARESH  
BHAYABHAI**



**PATEL  
HITARTH  
ASHVINBHAI**



**PARIN  
VIPULKUMAR  
PATEL**



**MEET  
DHIRAJBHAI  
SOLANKI**



**YASHVI  
KUMARPAL  
BHAGORA**



**MALEK  
MOHAMMAD  
SAHIL**



**NAGDA  
AHMADRAZA  
SARFARAJ**



# प्रार्थना

या कुन्देन्दुतुषारहारधवला या  
शुभ्रवस्त्रावृता या  
वीणावरदण्डमण्डितकरा या  
श्वेतपद्मासना  
या ब्रह्माच्युतशंकरप्रभृतिभिर्देवैः सदा  
वन्दिता  
सा मां पातु सरस्वती भगवती  
निःशेषजाड्यापहा ॥

आशासु राशीभवदंगवल्ली  
भासैव दासीकृतदुग्धसिन्धुम्  
मन्दस्मितैर्निन्दितशारदेन्दुं  
वन्देरविन्दासनसुन्दरि त्वाम् ॥  
शारदा शारदाम्भोजवदना वदनाम्बुजे  
सर्वदा सर्वदास्माकं सन्निधिं क्रियात् ॥

वक्रतुण्ड महाकाय सूर्यकोटि समप्रभ  
निर्विघ्नं कुरु मे देव सर्वकार्येषु सर्वदा



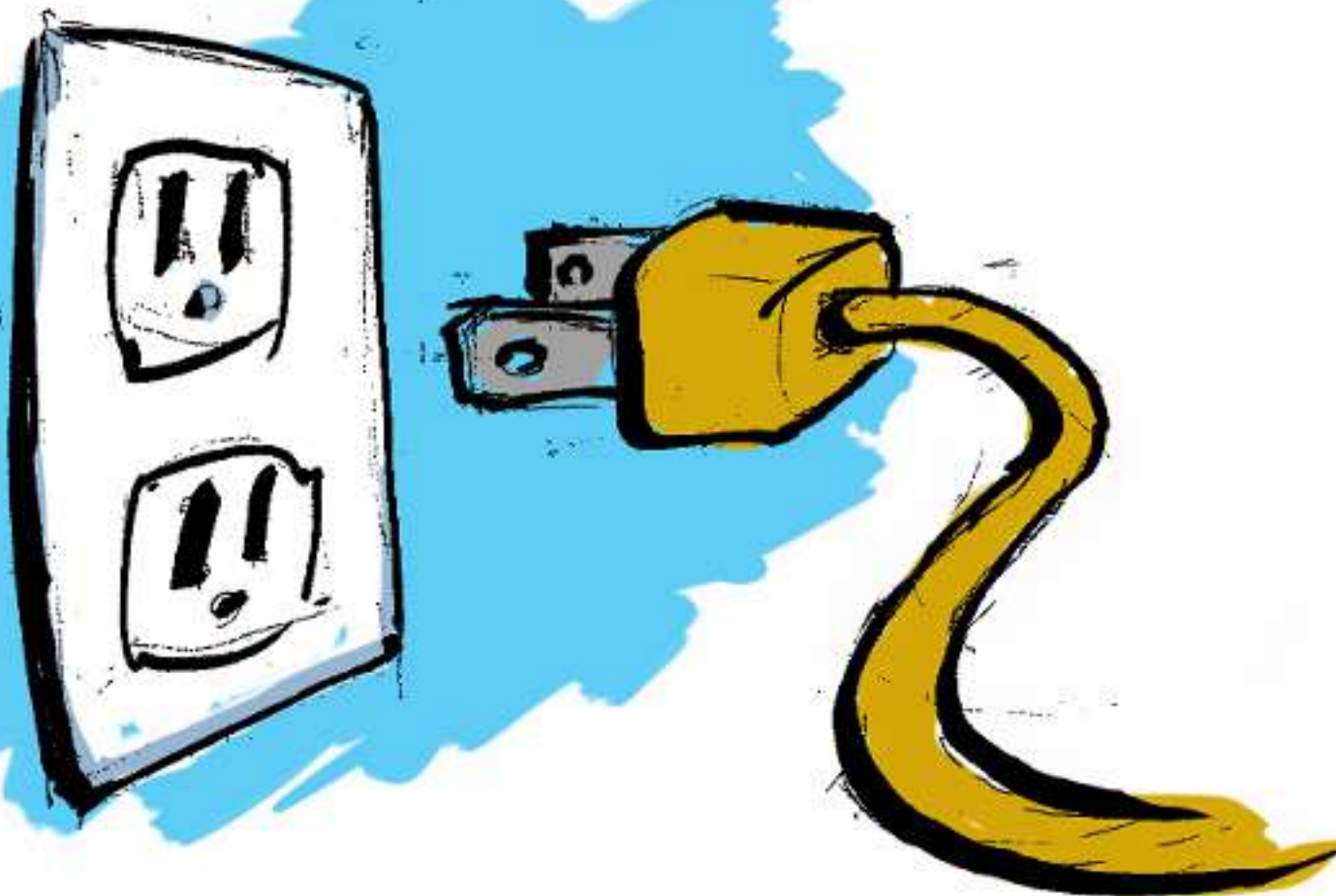
शुभारंभ



# **ABOUT MAGAZINE**

The magazine flashes the Image of Electrical Department of Government Engineering College, Modasa.

It aims to focus on various activities going on, in the department among students and faculty. The Magazine recognizes extra ordinary talent among the students who do their level best in their academic session to enhance the glory of the Department.



## Contents:

- *About Magazine*
- *About Department & Course*
- *Principal's Desk*
- *Message from HOD*
- *Laboratory facilities*
- *Faculty and staff*
- *Faculty corner*
- *Departmental activities*
- *Student activities and achievements*

## **ABOUT DEPARTMENT**

It is accommodated in main building, This department has various laboratories in the areas of Basic Electrical, Microprocessor, Electrical Machine, Electrical Measurement, Power Electronics, Computer Laboratory, High Voltage and Switchgear & Protection Laboratory. The Department has excellent Computer Centre.

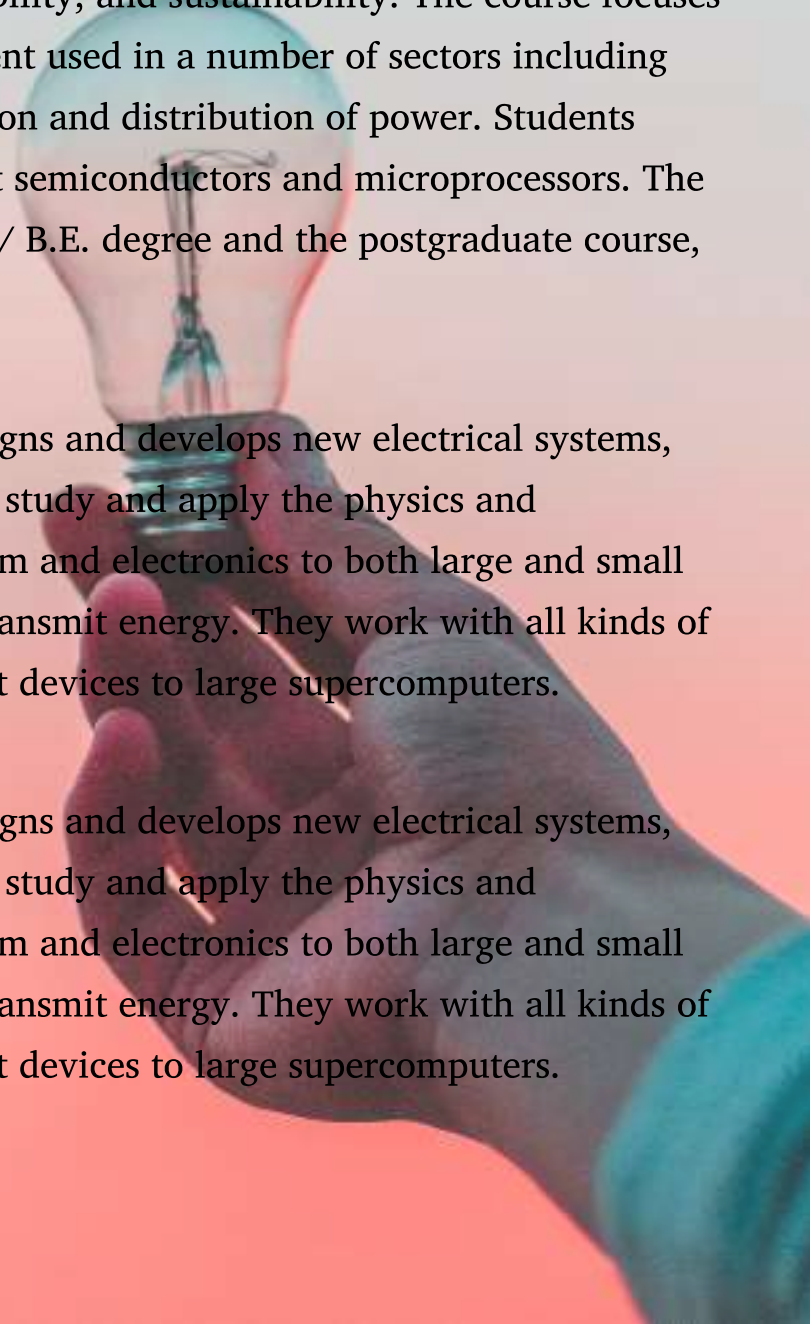
This department has laboratories in the field of Electrical Measurement, Electrical Machine, Power System, Micro Processor, High Voltage Engineering, Electronics and Control. The department looks after the electrical service/maintenance of the campus.

## **ABOUT COURSE**

Electrical engineering, one of the core courses of engineering discipline deals with the study of design, development, and maintenance of electrical systems and their components, ensuring quality, safety, reliability, and sustainability. The course focuses on the manufacturing of electrical equipment used in a number of sectors including construction and building and the production and distribution of power. Students pursuing electrical engineering study about semiconductors and microprocessors. The undergraduate course will award a B.Tech / B.E. degree and the postgraduate course, an M.Tech.

An electrical engineer is someone who designs and develops new electrical systems, solves problems and tests equipment. They study and apply the physics and mathematics of electricity, electromagnetism and electronics to both large and small scale systems to process information and transmit energy. They work with all kinds of electronic devices, from the smallest pocket devices to large supercomputers.

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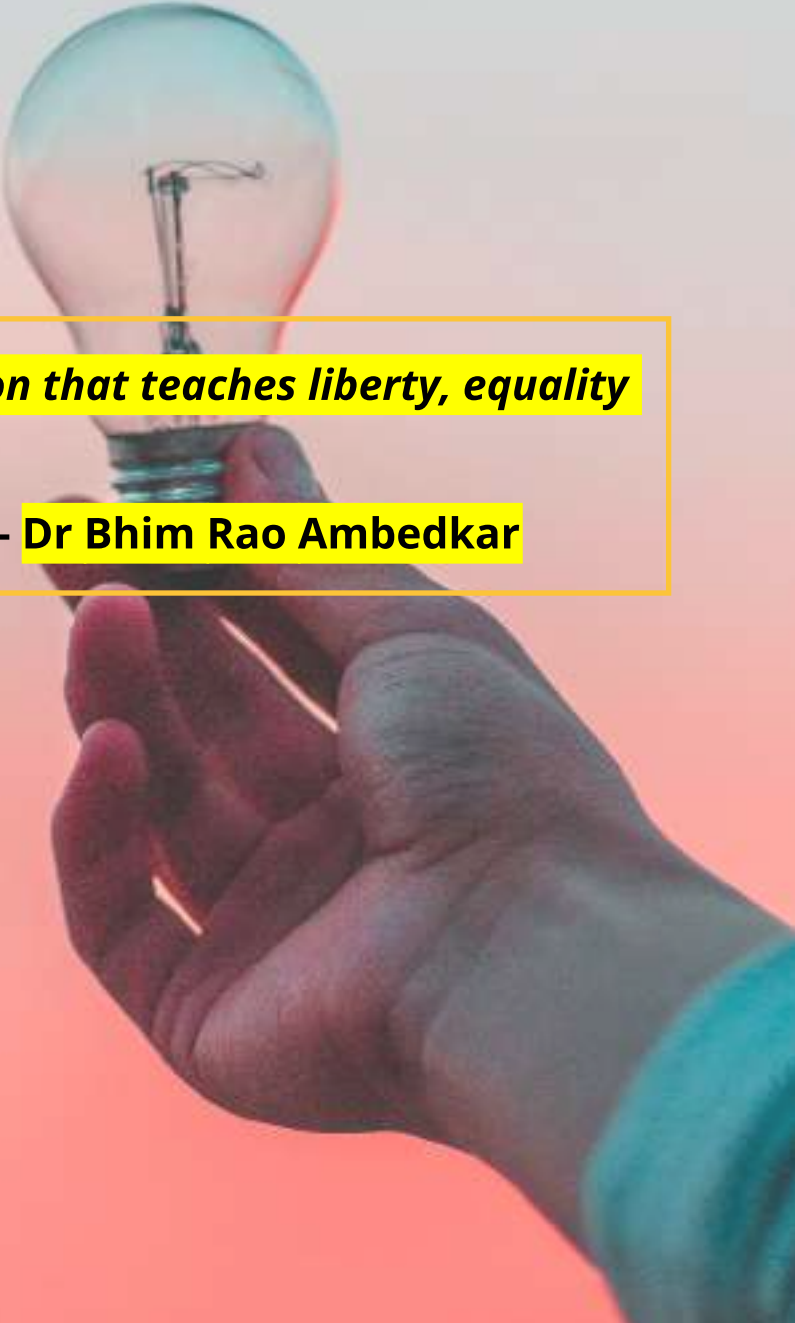
## **VISION**

- To promote an academic environment for excellent electrical engineering education by building strong teaching and research capabilities.

## **MISSION**

To provide high quality graduate program in electrical engineering so that it prepares students for:

- Higher studies.
- Research and collaborative activities.
- A professional career with essential technical and managerial skills.
- Adapting to change in technology.
- Use of technology for the benefit of society.



***"I like the religion that teaches liberty, equality and fraternity"***

**-- Dr Bhim Rao Ambedkar**



**DR. A. M. PRABHAKAR**

# PRINCIPAL'S DESK

## Greetings !

I welcome you all to travel through a prudent technological journey in Government Engineering College, Modasa. Technology has significantly changed the way we think, communicate and live. Consequently, it has opened doors for immense opportunities for the creative, rational and diligent persons.

Therefore, pragmatically prioritizing the things around helps a lot in achieving expectations; thus, for a student, conscientiously focusing on study and meticulously utilizing time should be the precedence.

The campus possesses well equipped laboratories and qualified faculty members. The faculty members are enthusiastically working and continuously adding to bring out top quality Engineers.

Holistic development of the students being our concern, we organize expert lectures, seminars, workshops along with sport and cultural programs to provide an environment where students can develop his or her interest. Thus the campus will provide abundant opportunities to learn and grow. We encourage the students to take advantage of all the resources for all-round growth.

I personally want my students to become confident and elegant enough to enjoy challenges they come across by developing an attitude of finding proper solution to it. Again I take opportunity to welcome you all to make your technological journey beautiful !





# HOD'S MESSAGE

**PROF. JYOTI R. IYER**

Greetings!

It gives me immense pleasure to take you through this new edition of Electrozone. Electrozone is a reflection of the promising Technological journey in Electrical Engineering Department. It will give you glimpses of the various activities in the department.

The strength of Electrical Engg. Dept, is qualified faculty and well equipped laboratories. The faculty of the department thrive to organize and enhance the academic, co-curricular and extra-curricular activities in the department. They work in a direction to harness the potential of the students and thus take them to new heights in all spheres of activity.

The department provides a conducive atmosphere where teaching and learning process is the first priority. This is tactfully supplemented with practical exposure for improving the critical thinking and problem solving skill of the students.

I appreciate and acknowledge the eagerness and enthusiasm of the students who have worked towards the making this magazine a success. My heartfelt gratitude to them.

All the best to my students!

## Interview with Prof. Darshan U. Thakar



### **1. What do you consider to be one of your greatest achievements? Why?**

To get second rank in whole GTU in 7<sup>th</sup> Sem and to crack the GPSC exams three times are my greatest achievements. This shows my hard work and honesty. It shows that success is the key of hard work.

### **2. Why did you choose education as your profession?**

Teachers get to inspire and educate young people. One day your students may become Nobel and Fields Prize winners, top business people, leaders, prime ministers and great artists or all-rounder individuals with a love for learning. By pursuing a career in education, you benefit the society as a whole. The impression you make on the individual in the classroom continues onto the next generation. This is a career where you have the opportunity to make a lasting difference to young students' lives.

### **3. What is your research interest?**

Electrical Vehicle Design and Signals Processing is my area of interest.

### **4. Why are you interested in Government Institute?**

Government workers are more valuable now than ever because they have the knowledge and passion to ensure a process like this will work—because they sincerely want it to. Band-aid approaches like freezing pay may score public points for a moment, but they create a whole host of unforeseen long-term consequences (like losing the best and the brightest to the private sector). As a government professor on the front lines to create the change everyone would like to see not only in college but in society.

### **5. What is role of teacher as per your point of view?**

Broadly speaking, the function of teachers is to help students learn by imparting knowledge to them and by setting up a situation in which students can and will learn effectively. But teachers fill a complex set of roles, which vary from one society to another and from one educational level to another. Some of these roles are performed in the college, some in the community.

## *Message to the students*

Being a good student is less about the ability to route and more about the desire to learn.

Education is not a safety net. It is the rocket which will propel you towards success. All you have to do is have an aim and work on everything that takes to get a lift-off.

If you always put limits on everything you do, physical or anything else, It will spread into your work and into your whole life. There are no limits in hard work. There are only plateaus, and you must not stay there, you must go beyond them.

As a student the most important thing to remember is that Laziness is your worst enemy and Hard Work is your best friend.

Success is the result of perfection, hard work, honesty, learning from failure, loyalty, and persistence.

Good grades are stepping stones towards getting into a good college, getting a good job and eventually living a good life. Shun those complacent C's, avoid those boring B's and strive every single day, to get those awesome A's.

Time can be your best friend and your worst enemy depending on whether you use it or waste it.

## Faculty & Staff:

Name	Designation	Qualification
Dr. J.R.Iyer	Associate Professor & Head	PhD.
Prof. M.J.Patel	Associate Professor	M.E.
Dr. H.D.Mehta	Associate Professor	PhD.
Prof. N.V.Upadhyay	Assistant Professor	M.E.
Prof. K.K.Bhatt	Assistant Professor	M.Tech.
Prof. M.N.Priyadarshi	Assistant Professor	M.Tech.
Prof. T.A.Chaudhari	Assistant Professor	M.E.
Prof. C.K.Bariya	Assistant Professor	M.E.
Prof. R.K.Kapadia	Assistant Professor	M.E.
Prof. N.B.Panchal	Assistant Professor	M.E.
Prof. S.V.Banker	Assistant Professor	M.E.
Prof. D.U.Thakar	Assistant Professor	M.Tech.
Dr. H.S.Pandya	Assistant Professor	PhD.
Prof. G.P.Rathod	Assistant Professor	B.E.
Prof. K.G.Kharadi	Assistant Professor	B.E.
Prof. P.K.Patel	Assistant Professor	M.E.
Shri S.K.Panchal	Electrician	
Shri. S.J.Patel	Electrician	
Shri A.K.Bhangi	Hamal	

## LABORATORY DETAILS

**Electrical Machine Laboratory** - This lab consists of equipments like D.C. Machines, Transformers, Synchronous machines, Induction Motors etc. It



provides an educational platform to the students wherein they can visualize the theoretical concepts being implemented. The students can not only understand the principle and operation of working of the machines but can also explore their performance characteristics.

**Measurement & Instrumentation Laboratory** - This lab is equipped with

various measuring instruments and transducers like Linear Variable differential transformer (LVDT), Thermocouple, Resistance strain gauge, Resistance Temperature Detector, Various Bridges etc. The



students can understand the fundamentals of various measuring instruments, their principles of operation and working.

**High Voltage Laboratory**- In this lab, the students can access and familiarize



themselves with operations of the high voltage equipments like impulse generator oil testing kit, horn gap arrester, solid insulation high voltage tester etc. The students are made aware of appropriate precautions to be taken while handling equipments in a high voltage laboratory.

**Basic Electrical Engineering Laboratory**-This laboratory enables the newly admitted students to understand the fundamental concepts of Electrical



Engineering. Students get an idea about the functioning of basic electrical equipments, domestic and staircase wiring procedures, MCB's ELCB's etc. The practical exposure helps develop skills in these freshers which they will require in the years to come.

**Embedded Systems Laboratory**-This laboratory provides a medium to the



students wherein they can understand the components like microprocessor, microcontroller etc. that constitute an embedded system. They can become familiar with the tools used to develop an embedded environment. They are able to implement small programs to solve well defined problems.

## Faculty Pursuing Ph.D.

Faculty Name	Area	University
<b>Darshan U. Thakar</b> Assistant Professor	Electrical Vehicles	Ganpat University
<b>Kaushal K. Bhatt</b> Assistant Professor	Power Electronics	Indus University

**Dr. Jyoti Iyer**, Associate Professor completed her Ph.D. in “Voltage Stability in Electrical Power Systems” from Gujarat Technological University.

## Papers Published by Faculty

Prof. J.R.Iyer	A Novel method for Power System Voltage Stability monitoring using Artificial Neural Networks with reduced input dimension	The IUP Journal of Electrical and Electronics Engineering, Volume XI, No. 1, 2018.	ISSN: 0974- 1704	43101
Prof. H.P.Vyas	Advanced Controlling of Induction Motor Using Drive, PLC and SCADA	International Journal of Technological Research in Engineering	ISSN: 2347- 4718	43160
Prof. M.N.Priyadarshi	Design and Simulation of a 100 W Sine Wave Inverter using IC CD 4047	IJSRST	ISSN: 2395- 602X	43160

## SHORT TERM TRAINING PROGRAM (STTP) THROUGH VIDEO CONFERENCING

Short term training program through Video-Conferencing was run by Directorate of Technical Education (DTE) connecting all 16 Govt. Engg. Colleges and DTE office. STTP for Electrical Engg., Civil Engg. , Mechanical Engg., Electronics & Communication Engg. and Computer Engg. were held in the duration Jan. 1<sup>st</sup> to April 27<sup>th</sup> , 2018.

5 faculty from Electrical, 7 from Electronics & Communication, 7 from Computer-IT, 9 from Mechanical and 2 from Civil Engineering took advantage of the training program. In Electrical Dept, the following two faculty took expert lectures.

<b>Prof. J.R.Iyer</b>	Associate Professor	Equal Area Criterion of Stability	GEC-Modasa	140	1-Apr-18
		Magnetizing Inrush and Protection against in a transformer	GEC-Modasa	140	1-May-18
<b>Dr. H.D.Mehta</b>	Associate Professor	Understanding of some interesting fundamental concepts in Electrical engineering	GEC-Modasa	140	1-Jun-18
		Optimal generation scheduling using classical and evolutionary techniques	GEC-Modasa	140	1-Aug-18



## The Induction program for the newly admitted first year students was started on 19<sup>th</sup> July 2018

1<sup>st</sup> day of the Induction program included the following activities:

- i. Welcome address and motivational talk by Prof.J.R.Iyer, Head of the Department, Electrical Engineering.
- ii. Video messages of the below mentioned dignitaries:
  - ✓ Shri Bhupendrasinhji Chudasama, Education minister of Gujarat.
  - ✓ Smt. Anju Sharma, Principal Secretary (Higher & Technical Education) Colleges & Universities
  - ✓ Shri K.K. Nirala, Director, Technical Education, Government of Gujarat
- iii. Introduction to facilities of the department and faculty members
- iv. Visit to the Institute Accompanied by senior student volunteers



Fig.1 Welcoming students with Rangoli in the Temple of Learning



Fig.2 Student volunteers at the Registration desk



Fig.3 Seeking Blessings of the Almighty



Fig.4 Welcome Address by Prof.J.R.Iyer, Head EE, GEC Modasa



Fig.5 Interaction with senior student volunteers



Fig.6 Introduction of Faculty members

## Regular Phase

The activity wise report of the above program is as follows:

### a) Physical activities:

Physical activities were carried out to strengthen their mutual bonding and psychomotor skills. The total activity was classified as:



- I. Yoga-Pranayam-Meditation
- II. Indoor and outdoor Sports

**I. Yoga-Pranayam-Meditation:** These activities were designed to support various aspects of yoga and their applications in day to day life to create holistic approach towards healthy life style and positive character building as mentioned below:



- i. Yoga and its significance in life. (Prof.H.S.Pandya)
- ii. Application of Yoga to synchronize “mind-body-emotion-energy” (Prof.H.S.Pandya)
- iii. Different types of yoga (Gyan-Bhakti-Karma-kriya-Naad-Raj yog) in Indian culture and their importance. (Prof.H.S.Pandya)
- iv. Practice of Yogasan, Pranayam and Meditation under the guidance of invited expert: Mrs. Rupa H. Mehta

**II. Indoor and outdoor Sports:** The sports activities were designed by Prof. Gajendrasinh Rathore to inculcate physical-mental and overall inclusive development of the newly enrolled students. He highlights were,



- i. Expert session by alumni students (Jay Prakash Upadhyay, Keshav Khyare and Manoj Bhagel) to inspire students towards sports.
- ii. Inspirational video of “Satyamev Jayate” based on leading sports.
- iii. Team wise chess tournament.

- 
- 
- iv. Interactive brainstorming and exploring sports talents of the students and classification of the students as per their sports interests.
  - v. Outdoor play based on above sports interest. This was on the institute playground. Games like cricket, volley ball and football was done and first year students were selected for the upcoming GTU sports festival.
  - vi. Bhargav Patel, 3<sup>rd</sup> sem EE student, took sessions on “Awareness for self defense” and “Karate”.


**b) Creative Arts:** Creative arts activities were planned with a view to help students to explore their creativity through different ways as listed below:

- 
- 
- i. Drawing sketches, “Express your life story-yourway” (Prof.H.S.Pandya)
  - ii. Drama (Prof. Kinjal Kharadi and Prof.Darshan Thakar)
  - iii. Musical show was organized to freshen up the new entrants.
  - iv. Vandan Bhavsar and Vraj Soni took a 2-hour session on role of music in day-to-day life.

**c) Universal Human Values:**

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- 
- i. Alumni of Electrical Engg. Dept were invited to share their experiences based on universal human values as follows:
    - a. Sweta Rajput, UPSC aspirant, delivered lecture on “How to prepare for UPSC”, “Personality development” and “Universal Human Values”.
    - b. Pal Modi, a girl who lost her father during her engineering studies, delivered lecture on “Universal human values” and how to conquer adversities in life.
    - c. Kunj Patel delivered a lecture on “Private sector job and its challenges”.
    - d. Samarth Upadhyay gave his views on “Young Entrepreneur”.
  - ii. Prof. D.A.Patel, Prof. D.H.Sahay, Prof. G.C.Panchal and Prof. D.R.Gohel delivered lectures on universal human values.
  - iii. Prof. D.A.Patel spoke on leadership using “Hiware Bazar” case study.
  - iv. Prof. Gajendrasinh Rathore delivered lecture on Leadership through Bhagavad Gita.
  - v. Emotional quotient and universal human values: fundamentals for high IQ. (Prof.H.S.Pandya)
  - vi. Fundamental qualities expected by Patanjali yoga and Universal human values. (Prof.H.S.Pandya)
  - vii. Prof.K.G.Kharadi spoke on “Women Empowerment”.

**d) Literary**

- 
- i. Importance of proficiency of English language for Engineering students (Prof. Gajendrasinh Rathore)
  - ii. Basic grammar and Literary practices (Prof.Gajendrasinh Rathore)
  - iii. Video “ Speech of Dr. Shashi Throor at Oxford Union on Impact of British rule in India”

### e) Proficiency Modules

- i. Prof. Prof.H.S. Pandya and Prof.G.P.Rathore delivered lecture series and practical sessions on various proficiency modules with a view to impart knowledge on the following aspects:
  - a. Determining English proficiency level of students and mentoring accordingly.
  - b. Learn the vocabulary, idioms, and expressions and understand their meanings in context. Develop ability to write a paragraph about general topics by using the English language correctly.

### f) Lectures by Eminent speakers: Electrical Engg. Dept invited distinguished dignitaries to motivate and inspire newly admitted students. The details are as follow:

- i. Shri Pankaj Mall, Key note speaker, cycle-man of India, One of the five Ceanliness warriors of honorable Prime Minister's pet project "Swachchhata Abhiyaan" throughout the nation, delivered a lecture on his vision-mission and on his foundation "Astitva" and its activities.
- ii. Dr. Himanshu Shukla, Project scientist (IIT BHU and IIT Delhi), delivered a lecture on "Upcoming challenges for future technocrats".
- iii. Ms.Arushi Mehta, TCS, delivered a lecture on "women in private sector and their challenges".



Fig.7 Motivational sessions and interaction with Eminent personalities

### g) Innovations: The following session were conducted to guide first year students as a part of students' induction programme:

- a. Dr.A.M Prabhakar, Principal, GEC, Modasa, conducted 3 hrs, brain storming session on Innovation, SSIP, future projects and leadership.
- b. Prof.K.K.Bhatt delivered lecture on "students start up Innovation program", and its activities at the department and institute level.

c. Prof. Kalpesh Vaghela, Automobile Dept., delivered a seminar on “Design engineering and innovative projects”.

### Visit to local area:

As a part of the student induction program, the newly admitted students of Electrical department along with six volunteer warriors of third year visited the village of Khalikpur located near Malpur crossroads , on 7<sup>th</sup> August, 2018.

**The objective of the visit** was to observe the village life, spread awareness, survey of existing problems in the village and if possible provide suitable solutions (ideas) as Engineering students.

First the students were divided into groups each led by one senior volunteer and after that each group was assigned different activities.

- ✓ **Surveying:** It was one of the most basic activities and a very important step in reaching our objective. We planned to go to each house in a team of five and ask some simple questions and interact with the residents. In this way we came to learn about the problems that they faced and still how they managed their village life.
- ✓ **Spreading Awareness:** Students in a same way as surveying went door to door to spread awareness about Rubela vaccination for young children and infants. Awareness was also spread about how necessary it is to have cleanliness in surrounding areas.
- ✓ **Interaction with the children of the village:** The engineering students gathered in a small primary school of the village where they interacted with children studying in that school. Some of the volunteers and our teachers gave some basic encouragement and knowledge regarding studies and they all had fun.
- ✓ **Electrical Components identification and Electrical safety awareness:** Prof.H.S.Pandya interacted with the school children about Electrical Components identification and Electrical safety in household electrical installations.
- ✓ **A game of Cricket:** With this objective in mind that “sports unites”, Prof.G.P. Rathore and students organized a cricket match with the school children to inculcate sporting attitude, team spirit and leadership and at the end of the match, we achieved the objective of developing bond among the students and villagers.
- ✓ At the end of the game we all gave away departing gifts to the children.
- ✓ Shivam Shelat, NCC cadet, delivered lecture on “Importance of NCC” and competitive exam for armed forces.



Fig.8 Along with Sarpanch, Khalikpur Village



Fig.9 Activity wise Group formation



Fig.10 Group getting information regarding vaccination campaign



Fig.11 Interacting with the villagers





Fig.12 Interacting and knowledge sharing with school children



Fig.13 Sports-Unites: Playing with school children



Fig.14 Taking pledge to stay connected and whole heartedly support the village



Fig.15 Departing moments

**Closing phase(2nd August 16, 2018):** Following activities were conducted on the last day of the student induction program:

- a. Shri Jigar Bhatt, Swamiji from ISKON, delivered a lecture on Humanity and Universal human values.
- b. Motivational speeches were delivered by Prof.G.P.Rathore, Prof.K.G.Kharadi, Prof. Nilam Panchal and Prof. H.S.Pandya .
- c. Interactive session between students and faculty members was organized.
- d. Feedback session was organized, wherein students shared their experiences and learning outcome of the Induction Program.



Fig.16 Students sharing their learning and feedback

- e. The students were informed regarding the time table of the new teaching phase. Brochures of the institute were also distributed to the students.
- f. The session ended with light refreshments for the students and faculty members.



### **Concluding Remarks:**

As per guidelines, from GTU, Institute coordinator and the Head, Electrical Engineering Dept, GEC-Modasa, the Department of Electrical Engineering organized three weeks of Students Induction Program from 19<sup>th</sup> July 2018 to 2<sup>nd</sup> August 2018.

The program included all kind of enriching sessions viz. Introduction to Department and Institute, Lectures by Eminent personalities, Lecture sessions on Universal Human values, Literary, Physical activities, Creative activities, Visit to village etc.

All the experts and faculty have contributed to the best of their knowledge and skills and students have participated in all the activities with great zeal and enthusiasm.

As a result, after going through the three weeks of Induction program, behavioral change was observed in the students. Students then demonstrated comfortable interaction within the peers and faculty members. Their confidence level boosted and they seemed ready to excel in the four years of study in the department ahead.

# CULTURAL ACTIVITIES:

*Cultural awareness and participation play an integral role in a student's education.*

The cultural programme in the college campus aimed :

- To give all students the opportunity to be involved in culturally enriching activities.
- To give those students with special talents a chance to extend themselves and to grow in their area of expertise.
- To expand students' appreciation of cultural activities

## Music Performance

Music at Government Engineering College, Modasa forms an integral part of the day to day lives of the students. Whether they are aspiring singers, instrumentalists or entertainers, there are many ways to participate in making music and developing performance and presentation skills.

## Debating, Mooting and Speaking

Government Engineering College, Modasa has a rich history in Debating, Mooting and Public Speaking. Throughout the four years in college, there are many opportunities for students to be involved in,

## Drama

Dramas allow both individuals and groups to explore, shape and symbolically represent ideas and feelings and their consequence. The students get many opportunities to showcase their dramatic talents.

## Dance

The most common thing in between a dancer and an engineer is to become a better version of themselves.

The purity of your soul is been described by your art. Art is the way to look the world with your own imagination. Looking with an different angle doesn't change the world but even in the darkest night, the most brighting star is seen. Dance is all about feelig yourself, being with your soul, Rest music will



# ARTICLES ;

## \*\* PAJ7620U2 Gesture Sensor \*\*

PAJ7620U2 can recognize 9 commonly used hand gestures for controlling arduino projects including move up, move down, move left, move right, move forward, move backward, circle-counter clockwise, circle-clockwise, and wave. These gestures data can be directly accessed via the I2C bus interface.

The PAJ7620 also gives built-in ability of proximity detection for the purpose of sensing object approaching or departing. The PAJ7620 is designed with great flexibility in power-saving mechanism.

### Function :

This module comes with in-built IR LED, optical CMOS array and uses I2C interface to control and program using Arduino Microcontroller. PAJ7620U2 modules costs less than \$3, and besides the Gesture Recognition modules, it is also featured with

- Built-in proximity detection,
- Flexible power saving scheme,
- Ambient light noise cancellation,
- Nine gesture recognition (Up / Down / Left / Right / Push / Pull / CW / CCW / Wave),
- Gesture speed is 60°/s to 600°/s in Normal Mode and 60°/s to 1200°/s in Gaming Mode,
- Ambient light immunity: < 100k Lux.
- I2C Interface up To 400 Kb/Sec

### Specifications :

- Operating voltage: 3.3V/5V
- Communication interface: I2C
- Recognition distance: 5cm ~ 15cm
- Recognition rate: 240Hz
- Recognition angle: 60° (diagonal)
- Dimensions: 16mm × 20.18mm
- Mounting hole size: 3.0mm
- Current Consumption
  - Operation State : 2.82 mA
  - Standby State: 2.3mA



### Applications of Gesture Sensor :

We can use hand gesture as an input to control another groove, or a computer, mobile phone, robot, smart car, and more with a simple swipe of your hand. Some of the more common application areas are

- Automobile Application
- Home Automation
- Low power battery operated HMI devices
- Gesture-Controlled Lock
- Hand Gesture Controlled Robot
- Gesture Mouse



### PAJ7620U2 Gesture Detection Range :

This Gesture Detection module works great between 5-15cm distance and flat mounting with view angle is about 60 degree.

It comes with 5-pin, 2.54mm pitch connector for I2C connection.

Pin No	Sensor Pin	Arduino Pin
1	VCC	Arduino 3.3V
2	GND	Arduino GND
3	SCL	Arduino A5 (SCL)
4	SDA	Arduino A4 (SDA)

The above schematic is applicable in Arduino Uno. In the same way you can connect this module to SCL and SDA pin of another Arduino board such as Arduino Mega and Arduino Nano.

### Conclusion :

This is a super cool gesture sensor module that enables you to control the physical environment using Arduino and Raspberry Pi without spending too much budget..

\*Sometimes it can be tricky while detecting the Forward gesture.

Pin No	Sensor Pin	Function
1	VCC	3.3V / 5V
2	GND	Ground
3	SCL	I2C Clock Port
4	SDA	I2C Data Port
5	INT	Interrupt Output

-- BY Shagun Tripathi  
( 3 rd Sem)

# WANNA TEST YOURSELF ?

1. Permeability of free space is also known as ?

- a) Magnetic constant
- b) Electric constant
- c) Electrostatic constant
- d) Magnetostatic constant

Answer: a

Explanation: The permeability of free space is also known as the magnetic constant. The permittivity of free space is the electrostatic constant.

2. A substance whose permeability is less than the permeability of free space is?

- a) Diamagnetic
- b) Paramagnetic
- c) Ferromagnetic
- d) Not a magnetic substance

Answer: a

Explanation: A diamagnetic material creates a magnetic field opposing that of the external magnetic field and it repels the external magnetic field. Hence its permeability is less than that of free space.

3. Which, among the following, have negative susceptibility?

- a) Diamagnetic
- b) Paramagnetic
- c) Ferromagnetic
- d) Not a magnetic substance

Answer: a

Explanation: Magnetic susceptibility is the degree of magnetisation of a material in response to the external magnetic field. Diamagnetic substances repel the magnetic field and hence have negative susceptibility.

4. Which, among the following, have positive susceptibility?

- a) Diamagnetic
- b) Paramagnetic
- c) Ferromagnetic
- d) Both paramagnetic and ferromagnetic

Answer: d

Explanation: Magnetic susceptibility is the degree of magnetisation of a material in response to the external magnetic field. Both paramagnetic and ferromagnetic materials have positive susceptibility as they get magnetised when placed in external magnetic field.

5. Which of the following quantities consists of S.I. unit as Hertz?

- a) Charge
- b) Force
- c) Frequency
- d) Power

Answer : c

Explanation: Frequency defined as the number of cycles per second and discovered by German physicist Heinrich Hertz. The S.I. unit of frequency is Hertz

6. What are the names of physical quantities which are independent of each other?

- a) Fundamental quantity
- b) Derived quantity
- c) Numerical quantity
- d) None of the above

Answer: a

Explanation: The fundamental quantities are those which are independent and are not derived from other quantities example length, mass, temperature etc.

7. To obtain a high value of capacitance, the permittivity of dielectric medium should be

- a) low
- b) zero
- c) high
- d) unity

Answer: c

Explanation: The expression of capacitance is given as  $C = (\epsilon A/D)$

Where  $\epsilon$  is the permittivity of the medium. Hence it is seen that the capacitance of a capacitor is directly proportional to the permittivity of the medium used as dielectric. Therefore to obtain a high value of capacitance, the permittivity of dielectric medium should be high.

8. 1 F is theoretically equal to

- a) 1 ohm of resistance
- b) ratio of 1 V to 1 C
- c) ratio of 1 C to 1 V
- d) none of these

Answer:

c

Explanation: 1 Farad capacitance is defined as the capacity of dielectric medium to store 1 Coulomb charge when 1 volt potential difference is applied across it. Thus, capacitance is expressed as the ratio of charge to voltage ( $Q = CV$ ).

9. Inductor does not allow the sudden change of

- a) current
- b) voltage
- c) power
- d) None of the above

Answer: a

Explanation: Sudden change of current means infinite voltage. Therefore it is not possible.

Quiz time!

--BY Shagun Tripathi

( 3 rd Sem)



# DID YOU KNOW ?

- **Electricity** has been a subject of scientific interest since at least the early **17th century**.
- **William Gilbert** was a prominent early Electrical scientist, and was the first to draw a clear distinction between **magnetism** and **static electricity**.
- The first practical application of Electricity was the telegraph, **invented** by Samuel F.B. Morse in 1837.
- Ben Franklin, Michael Faraday, and Thomas Edison made important contributions to our understanding of harnessing of **electricity**.
- An **Electrical Engineer** is someone who designs and develops new **electrical** systems, solves problems and tests equipment. They study and apply the physics and mathematics of **Electricity**, electromagnetism and electronics to both large and small scale systems to process information and transmit energy.
- Elihu Thomson was an English **Engineer** and inventor who was instrumental in the finding of major **Electrical** companies in the United States, the United Kingdom and France.
- **Test before Touch**. This is a mantra that every Electrical Engineer should remember. You need to check that there is no voltage before touching any live part. It may have been fed from a different source.
- Neutral is solidly grounded in the 415 V system at the user end to protect people from shock.
- System earthing and body earthing are different.
- Zero watt bulbs available in the market are not actually rated for zero watt. Their ratings vary from 5W to 20W.

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