# GANDHINAGAR INSTITUTE OF TECHNOLOGY

# BRIDGE COURSE

# REPORT

# 2015-16

**GANDHINAGAR INSTITUTE OF TECHNOLOGY**

Approved by AICTE and Affiliated to GTU

Khatraj - Kalol Road, Vil. Moti Bhoyan, Tal.Kalol
Dist: Gandhinagar-382721.

## Objective of Bridge Course:

With the objective to acquaint new entrants with classroom atmosphere and to enhance various capabilities in them, the Bridge Course was conducted in **Gandhinagar Institute of Technology** as per the syllabus designed by **Gujarat Technological University**. The Bridge Course was executed for the period of four weeks, i. e. from 2nd August, 2015 to 31st August, 2015. The Bridge Course is aimed to act as a buffer for the new entrants, with an objective to provide adequate time for the transition to hard-core engineering courses. The toughest task for any learner ranging all fields of academia is to enter into the new body of knowledge leaving the dated ideas behind. In order to bridge this gap, one requires a paradigm shift from leading to the newer and better realm of knowledge. It provides the learners an opportunity to enter into the domain of engineering with a swift move, by helping them understand the educational environment of the current trend. During this interaction of 4 weeks with the faculty and their classmates, the students equipped with the knowledge and the confidence needed to take on bigger challenges as future engineers of this country.

## Activities-

Following are the four major components of the Bridge course-

1. Village Visit- 5 days
2. Learning Engineering —7 Days
    a. Technical Movies—1 Day
    b. Learning Engineering-Bloom's taxonomy – Creating awareness about the learning domain – 3 days
    c. Study of Technical Disaster and Innovation- presentation- Group work development of Collaborative problem solving skill- 3 Days
3. History of Science & Technology- 5 Days
4. Life Skill—5 Days

# Activity: 1
# A Detailed Report on Village Visit

As a part of Bridge Course activities, Gandhinagar Institute of Technology initiated the activity of Village Visit for the first year students of engineering. Various departments of GIT such as Mechanical Department, Computer Department, Information and Technology Department, Electrical Department, Civil Department etc. had conducted the village visit for a week period in different villages. The main objective of 'Village Visit' is to observe the village life style and the routine life of villagers. It also includes the helping attitude towards the villagers and tries to solve their problems technically. To fulfill this purpose, the first year students of Gandhinagar Institute of Technology visited the nearby villages such as Ram Nagar, Moti Bhoyan and Sherisa. The following is the detailed description of village visits conducted for the first year engineering students:

**Day: 1**

On the very first day, students were divided to visit different villages and followed the same instructions given to them. They visited the villages Ramnagar, Moti Bhoyan, Sherisa and observed the life skills of the villagers. Students compared the villagers' life style with their own and suggested the villagers to improve their life style with the help of technology.





During the visit, students came to know about the pride matter of Ramnagar village. This village is awarded for Swachch Bharat Abhiyan by PM Modi. The students were also inspired from this proud moment and learnt the importance of cleanliness in their lives. Below is the image that shows the award given to the Sarpanch of Ramnagar.



Students interacted with people and helped some of them to complete their work. They also observed their routine life and made a list what they have and they don't have.

**Day: 2**

On the second day, all the students were distributed in a group of 4 students. They interacted further with villagers and understood what they can do for the betterment of these villagers


The students also visited the schools and observed how the children study in these schools and which are the facilities given to them. The students had also joined the prayer in the schools.


**Day: 3**

On the third day, the students had discussed internally in a group how they could solve the problems of villagers technically. They also gave fruitful suggestion to them. They had studied about the technical feasibility in the village and also searched about the availability of the resources at village.

In some villages students also visited few villagers to collect the information about computer literacy and technology awareness. Thus, they came to know that there is a huge gap in computer literacy between these villagers and urban people. It shows that they require special attention in this field to walk with the urban area and special programs should be conducted to make these villagers aware of computers and technology.

**Day: 4**

On the fourth day, all the students had decided to spend the whole day with school children and villagers. They played various games with the village people as well as school children. They discussed with the children about their dreams and their education. They also encouraged them to learn well and get the higher education in order to be successful and progressive in their lives. They had also distributed gifts and prizes among the school children. They also experienced a day without facilities.

At the end, all the students had enjoyed their meal on the temple ground. They had also collected fund to donate for the renovation of the temple. They had experienced many wonderful moments to live as a villager.

**Day: 5**

On the last day of their village visit, all the students and faculties had arranged a basic awareness session with primary school teachers and also with some active villagers to solve their problems technically and also discussed about the government facilities available for the villagers' betterment. They also discussed about their expectations for the improvement of village life. Besides this session, students enjoyed to have a visit of some temples, lakes and the culture of the village.

At the end, the students also distributed some useful gifts among the village children. Throughout these five days, they all experienced awesome moments which will be remained lifetime memories for them.


# Activity-2
# Learning Engineering

Learning Engineering was taught to the new entrants of Gandhinagar Institute of Technology for the duration of one week, which included different topics such as showing **Technical Movies, Bloom's Taxonomy** and **Study of Technical Disaster and Innovation**. Through **1st activity, i.e. Showing Technical Movies,** learning attitude of students has been shifted from rote learning to analyzing, evaluating and creativity and to provide the bridge between current learning attitude to engineering learning attitude. In **the 2nd activity i.e. Bloom's Taxonomy,** students of different departments like Computer, Information and Technology, Electronics and Communication, Electrical, Civil and Mechanical Engineering did various activities and fulfilled the purpose of **Remembering**: Recall or retrieve previous learned information, **Understanding:** Comprehending the meaning, translation, interpolation, and interpretation of instructions and problems. State a problem in one's own words, **Applying:** Use a concept in a new situation or unprompted use of an abstraction, **Analyzing:** Separates material or concepts into component parts so that its organizational structure may be understood. Distinguishes between facts and inferences, **Evaluating**: Make judgments about the value of ideas or materials **Creating:** Builds a structure or pattern from diverse elements. Put parts together to form a whole, with emphasis on creating a new meaning or structure. Through **3rd activity i.e. Presentation on Technical Disaster and Innovation** the learning attitude of students has been shifted from rote learning to understanding, analyzing designing and creating; to prepare a presentation on any one Technical Disaster or Innovation with which some technical concepts, knowledge and information can be concluded and to develop soft skills like self-learning, group behavior, group ethics, management skills and presentation skills as well as technical skills amongst students. Different departments conducted the subject as follow:

## Learning Engineering
## Computer Department

### Activity-1 Technical Movies

**Day: 1**

**Different movies were shown to the students:**

1. Social Network
2. Gravity
3. Interstellar

During the movies student had discussed different aspects of movies with one another. Students had discussed about technical aspects of movies and derived so many interesting objects regarding movies. Students were explained what is the purpose to show movie and the way they have started learning. While answering movie questions, students had to observe, analyze, evaluate, predict and present their ideas and thoughts.

### Activity-2 Bloom's Taxonomy

**Day: 2**

During the 1st session, students were taken to the lab for three sessions. Each session is divided as below:

| Sr. no | Time | Topics | Hands on Exercise |
|---|---|---|---|
| 1 | 09:00 To 11:00 | Basics of Microsoft office | Micro Soft Word, Making Resume |
| 2 | 11:45 To 01:45 | Basics of Microsoft office | Excel Mark sheet, Excel sheet |

| | | | |
|---|---|---|---|
| 3 | 02:00 To 04:00 | Basics of Microsoft office and Power Point | Making PPT on selected topic. |

From the activities, students learnt to use different menus and options of Microsoft word and prepared their Resumes. Students also learnt various functions of Excel.

**Day: 3**
During the 2nd session, students learnt the following:

| Sr. No. | Time | Topic | Hands On Exercise |
|---|---|---|---|
| 1 | 09:00 To 11:00 | Network Devices, Network Topology, How to install Operation system (Windows, Linux), Basic Linux Commands | Learnt to make a small report on uses of network devices |
| 2 | 11:45 To 01:45 | SWOT Analysis of Website | Perform SWOT analysis for selected website |
| 3 | 02:00 To 04:00 | To study about SEO | Based on the given document find the rank of the given website |

Students are now aware about the search engine and ranking of the websites, based on which, search engine decides to sort the websites to be displayed as per the given keyword. Through networking activities, student got acquaintance with different devices of Networking. Students learnt about network topology and installation of Windows and Linux.

After the completion of Linux installation, students learnt different commands and instructions of Linux. From networking activity, students got acquaintance of different devices of Networking.

**Day: 4**

Students were taught about different aspects of web sites by respective faculty members. Students learnt how to do SWOT analysis (alternatively SWOT matrix), a structured planning method used to evaluate the strengths, weaknesses, opportunities and threats involved in a project or in a business venture.

For the exercises, students had done swot analysis of the chosen web site by them.

Students became aware about the search engine and ranking of the websites, based on which search engine decides to sort the websites to be displayed based on the given keyword.

Students have also designed the question papers of 12th standard science stream.

## Activity-3 Study of Technical Disaster and Innovation Presentation Activity

**Day: 5**

1. Videos were shown on Technical innovation or Technical disaster by faculty members.

    - Y2K problem
    - The 1990 AT&T Long Distance Network Collapse
    - 1979 Machchhu dam failure
    - Columbia Space shuttle disaster

2. Faculty provided steps to make the presentation.
3. Making of group of students[10 to 12 students per group] and allotment of topics (students can also search and decide the topic of presentation)
4. Students gathered information about the topic i.e. pdf documents, research papers, information on internet, videos, audios, animation etc.

**Day: 6**

1. Students discussed in groups, divided the given work, gathered information, understood the concept and prepared presentations in the provided structure.
2. Preparation of the presentation by the students.

**Day: 7**

Presentation was done by all the students in groups in the provided structure. Students came to know how to prepare presentation and how to work in a team. After the presentation, students who had given the best presentations were appreciated and some suggestions were provided to the students who were not able to present their topic in the fair way.

## Learning Engineering
## Information Technology Department

**Activity-1 Technical Movies**

**Day: 1**

The following movies were shown to the students as a part of this activity.
1. I Robot
2. The Secret
3. Gravity

During the movies, students discussed different aspects of movies with one another. The groups of students were formed and in the middle part of the movies they were asked the questions and supposed to give the answers. They applied higher order thinking skills throughout the activity.

The rest part of movie was shown after the question-answer session on prior part of movie. After the completion of movie, discussion and summarization of answers were done.

**Activity-2 Bloom's Taxonomy**

**Day: 2**

In this activity, students were guided regarding the importance of Bloom's taxonomy and its different levels which are as follows:

- **Creating**: Generating new ideas, products or ways of viewing things, designing, constructing, planning, producing and inventing etc.
- **Evaluating**: Justifying a decision or course of action, checking, hypothesising, critiquing, experimenting, judging etc.
- **Analysing**: Breaking information into parts to explore understanding and relationship, comparing, organising, deconstructing, interrogating, finding etc.

- **Applying**: Using information in another familiar situation, implementing, carrying out, using, executing etc.
- **Understanding**: Explaining ideas or concepts, interpreting, summarising, paraphrasing, classifying, explaining etc.
- **Remembering**: Recalling information, recognising, listing, describing, retrieving, naming, findings etc.

After this guidance, the group of students were formed and asked to design the physics paper using bloom's taxonomy criterion.

After theory session they were taken to lab for further practical experiments, the details are as below:

| Sr. No. | Time | Topics | Hands on Exercise |
|---|---|---|---|
| 1 | 11:45 To 01:45 | Basics of Microsoft office | Using MS Word: Make your Resume |
| 2 | 02:00 To 04:00 | Basics of Microsoft office | Using MS Excel: Make the Mark sheet |

From this activity students learnt to use different menus and options of Microsoft word and prepared their Resume. Students also learnt various functions of Excel and did practice on it.

**Day: 3**

| Sr. No. | Time | Topic | Hands On Exercise |
|---|---|---|---|
| 1 | 09:00 To 11:00 | Basics of Microsoft office Power Point | Made PPTS on selected topics. |
| 2 | 11:45 To 04:00 | Networking Devices, Network Topology, How to install Operating System (Windows, Linux)? Basic Linux Commands | Made a small report on uses of network devices |

From this activity students learnt how to use different menus and options of Microsoft Power Point.
From networking activity students got acquaintance of different devices of Networking.

**Day: 4**

| Sr. No. | Time | Topic | Hands On Exercise |
|---|---|---|---|
| 1 | 09:00 To 01:45 | SWOT Analysis of Website | Perform SWOT analysis for selected website |
| 2 | 02:00 To 04:00 | To study about SEO | Based on the given document found the rank of the given website |

Students got the information about the search engine and ranking of the website and using SWOT analysis.

## Activity-3 Study of Technical Disaster and Innovation Presentation Activity

**Day: 5**

1. Videos were shown on Technical innovation or Technical disaster to the students by the faculty:

   - Y2K problem
   - The 1990 AT&T Long Distance Network Collapse
   - 1979 Machchhu dam failure
   - Columbia Space shuttle disaster

2. Providing steps to make the presentation
3. Making of group of students[10 to 12 students per group] and allotment of topics (students were also allowed to search and decide the topic of presentation)

**Day: 6**

1. Students gathered information about the topic i.e. pdf documents, research papers, information on Internet, videos, audios, animation etc.
2. Students discussed in groups, divided the given work, gathered information, understood the concept and prepared presentation in the provided structure
3. Preparation of the presentation

**Day: 7**

Presentation by all the students in the provided structure of presentation. After this activity students came to know how to prepare presentation and how to work in team. Students with best presentations were appreciated and students who could not present their topics in fair way, were given some suggestions to improve their presentations.

# Learning Engineering

# Electrical Department

**Activity-1 Technical Movies**

**Day: 1**

Different motivational movies and talks were shown to the students. The different movies shown were:

- Social Network
- The Secret
- TED Talks: These are 5-10 minute videos on different topics.
  1. Blending Technology and Classroom Learning
  2. How big is infinity?
  3. How do you know you exist?
  4. How fast you are moving right now?
  5. What percentage of brain do you use?
  6. Why does ice float on water?
  7. Why don’t oil and water mix?
  8. Why is glass transparent?

The day was concluded with a question-answer session.

**Activity-2 Bloom's Taxonomy**

**Day-2**

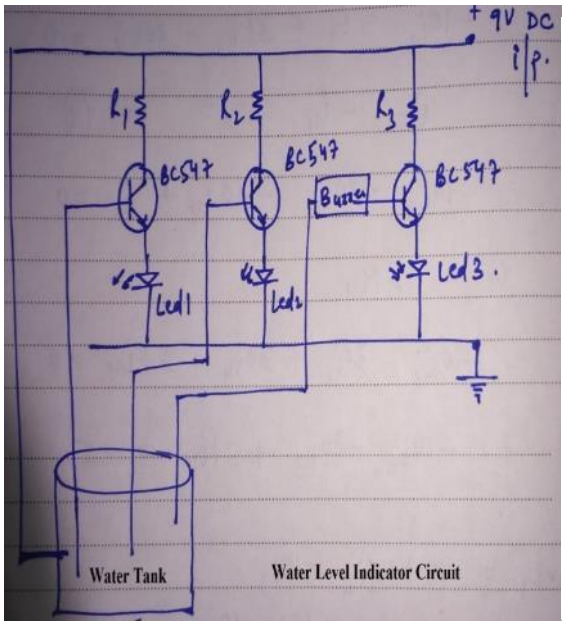
Different concepts were taught to the students. There were three sessions in a day.

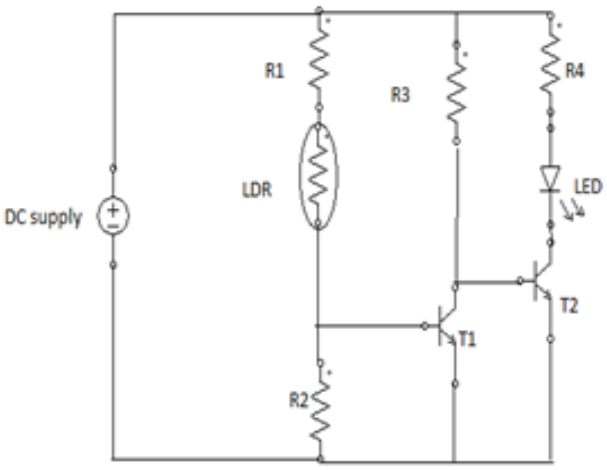
- Concept of **Voltage Divider Rule** was taught and some examples related to this topic were discussed.
- Students were taught about the electrical components like carbon resistors, coding of resistor, transistors and its characteristics, bread board etc. Basic Concept of **Electrical Engineering** was taught and some examples related to the **Transistor as a Switch** and its applications were discussed.

**Day 3:**

**Circuitry understanding**

- In this session, students were taught about the circuit of **Water Level Indicator and Dark Sensor.**



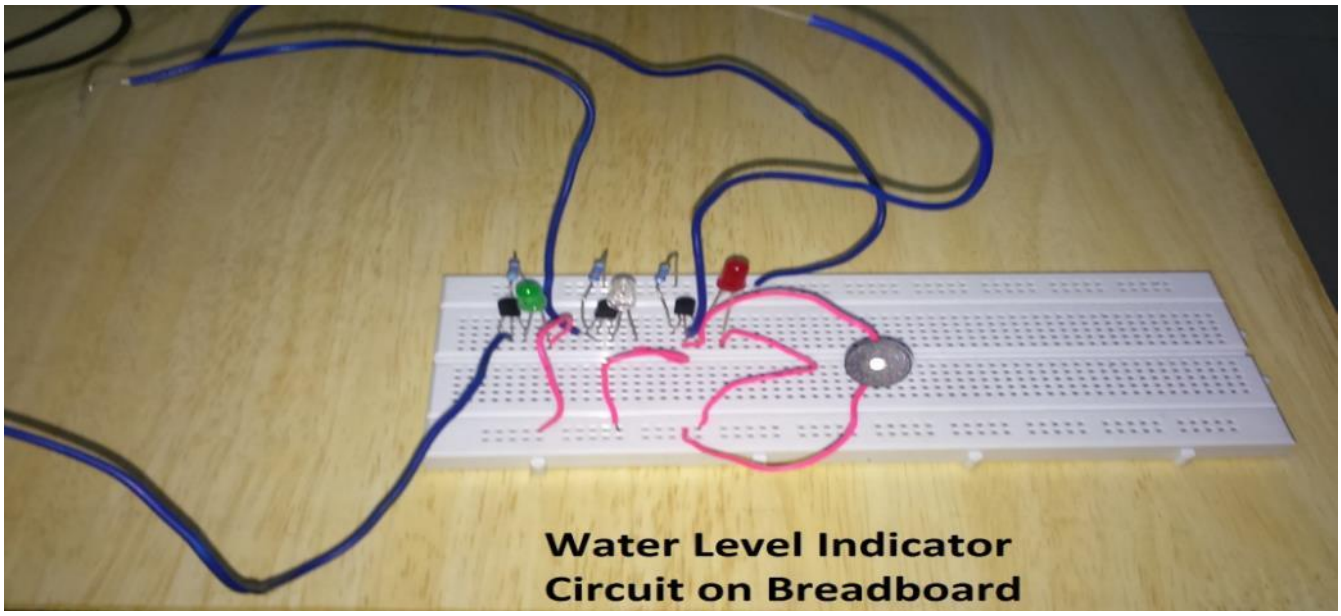

Dark Sensor Circuit

- Functioning of the circuit and functioning of individual components were described to the students.
- Students were encouraged and guided by the faculty member to make **Water Level Indicator circuit.** Some problems regarding circuit were resolved and some healthy discussion had done in the class.

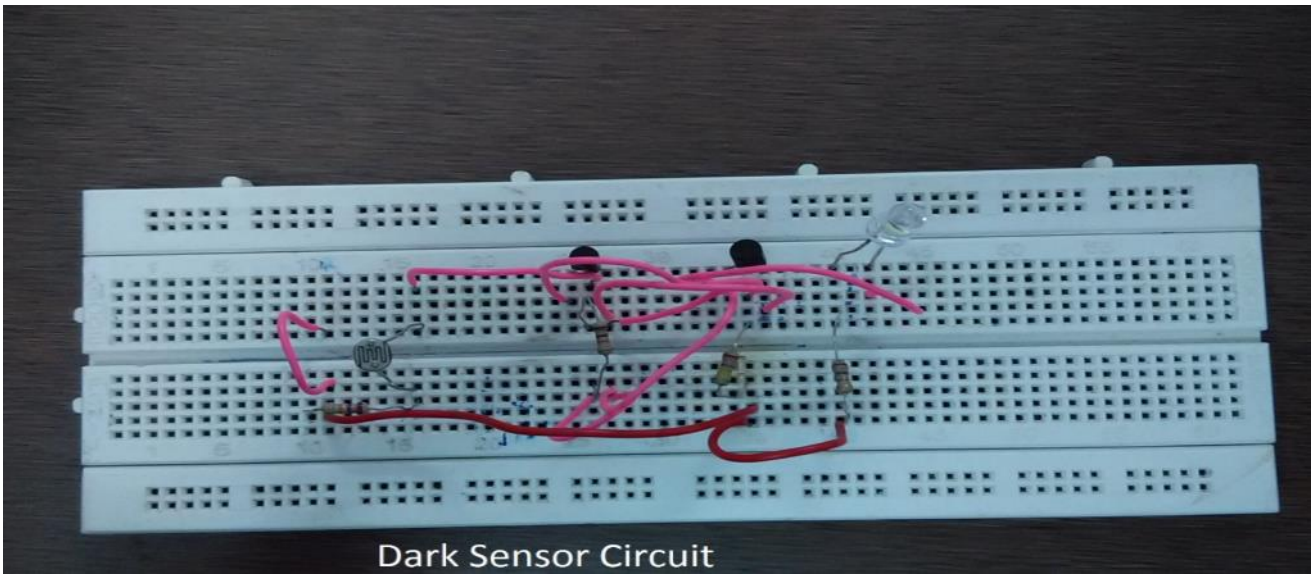
**Day: 4**

**Circuit making**

- **Circuit making (a)** In this session, **<u>Water Level Indicator circuit</u>** was developed on Breadboard by faculty for thorough understanding of the students. A detailed explanation was given about the circuit practically.




- **Circuit making (b)**:- In this session, **<u>Dark Sensor circuit</u>** was developed on Breadboard by the faculty for the better understanding of the circuit. A detailed explanation was given about the circuit. Students were encouraged and guided by the faculty members to make **<u>Dark Sensor Circuit.</u>** Some practical problems regarding to the circuit, practical applications of the circuit, and advantages of the circuit to the society was discussed in the class.




**Day: 5**

Presentation on Technical Disaster and Innovation

- A healthy discussion on the various electrical disasters, its causes and effects and the various electrical innovations were carried out with the students.
- Presentation on one electrical disaster and one electrical innovation were given by the faculty members on the following topics:

i. Electrical Disaster: Blackout, its causes and effects with examples.
ii. Electrical Innovation: Electrification of Train

- Some videos were shown on the following topics:
  i. Opportunities and challenges in the Electrical Engineering.
  ii. Arc Flash, Electrical Shock and Explosion
  iii. Electrical fire safety
  iv. Homemade, Innovative electric bicycle system(smart-cycle)

**Day: 6**

- Students were divided in four groups and were given different topics by the faculty members and were encouraged to give a power point presentation on their respective topics.
- The various topics given were:
  (i) Causes and effects of voltage sag and swell.
  (ii) Causes and effects of change of frequency in electrical system.
  (iii) Effects of integration of renewable energy sources in the system.
  (iv) Causes and effects of Blackout occurred on 30th July, 2012 on northern and eastern grid of India.
- Students were asked to gather information regarding their topics from the internet, available research papers, pdfs and documents.

**Day: 7**

- Students were given some time to prepare their power point presentations.
- Students gave presentations on their respective topics.

# Learning Engineering
# Mechanical Engineering Department

**Activity-1 Technical Movies – Ice Breaking**

**Day-1**

**Objective**: To shift learning attitude of students from rote learning to analyzing, evaluating and creativity.
**Theme**- "*An eye is powerful than an ear*" (Sherman, 2003).
The very first day of learning engineering was dedicated to watch technical movies and to provide the bridge between current learning attitudes to engineering learning attitude. Following three movies were displayed to students and technical discussion sessions were held in between.

| S.No. | Name of Movie | Topic of discussion |
|---|---|---|
| 1 | I-Robot | 1) What safety and insurance regulations are necessary for Robot?<br>2) If a robot causes harm due to a malfunction or a wrong decision taken autonomously who is to take the blame and be made to bear the consequences, such as Legal liability? Is it the owner, or the designer, or the seller or all three |

| | | |
|---|---|---|
| 2 | Gravity | 1) Life beyond atmospheric range |
| 3 | Big hero 6 | 1) Nano-bots (Nano size robots)<br>2) Artificial intelligence- curse or boon |

Students were able to start changing their perspective of learning by introducing higher order thinking skills like Analyzing and Evaluating. Technical discussions promoted this further.

**Activity-2 Blooms Taxonomy-Ways to learn Engineering**
**Day-2 and 3(Half)**

*Build the longest chain that will hold the most weight*:
The theme of this activity was kept as "Best from the Waste". The aim was to build a longest possible chain made out of the supplied raw/ waste material which can hold the maximum weight. The students were explained about various chain mechanisms and a thorough discussion took place between faculty and students about various possibilities of chain making.
The students were divided in groups of 4-5 and first asked to draw the schematic of chain they can think of and can prepare accordingly. They all came with different arrangements. Following raw materials provided for every group of students-

| | |
|---|---|
| Straws | 10 |
| Wooden Craft Sticks | 10 |
| Index Cards (3 x 5) | 20 |
| Pieces of Paper (8 1/2" x 11") | 10 |
| String or Thread | 200 cm |
| Masking Tape | 200 cm |
| Pipe Cleaners | 10 |
| Rubber Bands | 10 |
| CDs(useless) | 2 |

Students could now observe and evaluate their ides of building a chain. All the groups were trying to make a different kind of chain.

***Day- 3(Half) and 4***

*Balloon car which runs on newton's third law:*

The theme of this activity was kept as "Real Life Application of Theories". The aim was to build a small car propel-able with balloons which can cover the maximum path. The students were given the introduction of newton's third law of motion- Every action has an equal and opposite Reaction and some real life examples were illustrated. A small working model of car was demonstrated. All the students were divided in groups of 4-5 and each team was instructed to draw a schematic of such propel-able car. Each group was provided following materials-

| | |
|---|---|
| Balloon | 1 |
| Flexible straw | 1 |
| Rubber band or tape | 10 |
| Bottle caps / CDs | 4 |
| water bottle / juice can/ cardboard sheet | 1 |
| straws/chopsticks | 4 |

## Activity-3 "Presentation on Technical Disaster or Innovation"

**Day: 5**

*Activity: - Power Point Presentations and video*
Following is the list of various topics covered through PowerPoint presentation and videos on technical innovation and disaster-

- Presentation on NASA space-shuttle disaster (Challenger)
- Presentation on Titanic disaster
- Presentation on Google glass
- Video on NASA space-shuttle disaster (Challenger)
- Video on Google glass and applications
- Presentation on 3D printing and live demonstration of 3D printer.

**Day: 6**

Power point presentation and videos on technical innovation and disaster

- Presentation on NASA space-shuttle disaster (Challenger)
- Presentation on Titanic disaster
- Presentation on Google glass
- Video on NASA space-shuttle disaster (Challenger)
- Video on Google glass and applications
- Videos on vertical farming
- Students were taught how to prepare a presentation using slides or MS office.
- Allocation of topic in group of students for preparation of presentation

**Day: 7**

- Students went to lab having PC facility, along with faculty and prepared presentation on their respective topics.
- Students presented their presentation on projector in front of class.

# Learning Engineering
# Civil Engineering Department

**Activity-1 "Tech Movies – Ice Breaking"**

**Day: 1**

The duration of this activity is of 1 day. The students were taken into auditorium hall (A-105) of the college and were shown different technical videos like Construction of Burj Khalifa in different stages. Also movies like "Social Networking and "Gravity" were shown and made the students understood the movie by technical terms. At the end questionnaire was prepared by faculty members and students had answered them.

**Outcome:**

The perspective of learning by introducing higher order thinking skills like: Analyzing and Evaluating,

Development of **Affective domain** *(feelings or emotional areas)* and **Psychomotor** *(Manual skills)* domain amongst students developed.

**Activity: 2 "Blooms Taxonomy-Ways to learn Engineering"**

**Focus:**

- To estimate the cost of industrial building
- Quantity surveying is concerned with controlling and managing the construction projects

**Objective:**

- To aware the students about the skill of estimation and coasting.
- To develop the consultancy etiquette.
- To relate the application of mathematics in civil engineering field.
- To grow engineering learning domains amongst students – **from Understanding to Creativity**

**Day: 2**

- Students had visited the civil engineering department and observed the different components of building. Students had remembered all the components of the building.
- Students were given a questionnaire to solve based on remembering and understanding of previous discussion.

**Day: 3**

- Each group had allotted different room of civil department (Block B) for estimating and costing.
- Students had identified different components of that room like doors, windows, beam, column etc.
- Students had measured the length, width, height of room, nos. of column, beam, size of doors and windows.
- Students had filled quantity sheet as per the given components.

**Day: 4**

Facilitator had provided chart of material required for one cubic meter of construction for brick work and R.C.C. work Rates.

- By using this chart students got quantity of materials like cement, sand, water, aggregate, paints, wood etc.
- For creativity purpose students had drawn one small plan of residential building and had found the quantity of different materials and total cost of construction of that plan.
- They had implemented the knowledge of various building components and materials for the given task

**Outcome:**

- To be able to value any type of building.
- To be able to apply knowledge of mathematics in civil engineering.
- To be have confident consultancy field.
- Development of Cognitive (*knowledge*) and Psychomotor *(Manual skills)* domain amongst students.
- To determine if it is a sound investment/decision (justification/feasibility)

**Requirements:**

1. List of Equipment:

   Quantity sheet, Drawing sheet, Pencil, eraser, scale, measuring tape, calculator (one for each group)
2. Number of students per batch : 20 to 25
3. No. of students in one group: Minimum 5

| RATE ANALYSIS FOR 1 CUBIC METER BRICK WORK | | | | | |
|---|---|---|---|---|---|
| **Sr. No.** | **MATERIALS** | **QUANTITY** | **UNIT** | **RATE PER UNIT** | **AMOUNT** |
| 1 | BRICK | 500 | NOS. | 1200 (PER 500 BRICKS) | |
| 2 | SAND | 1.14 | CUMT. | 720 | |
| 3 | CEMENT | 5.5 | BAGS | 336 | |
| TOTAL | | | | | |
| 4 | MASON | 2 | HEAD/ DAY | 450 | |
| 6 | LABOUR | 1 | HEAD/ DAY | 300 | |
| TOTAL | | | | | |
| 8 | 1.5 % WATER CHARGES | | | | |
| 9 | 3% CONTIGENCIES | | | | |
| 10 | 10% PROFIT | | | | |
| | **GRAND TOTAL** | | | | |

Students are doing Rate Analysis in classroom

## Activity-3 “Presentation on Technical Disaster or Innovation”

**OBJECTIVE:**

- To shift learning attitude of students from rote learning to understanding, analyzing designing and creating
- To prepare a presentation on any one Technical Disaster or Innovation with which some technical concepts, knowledge and information can be concluded
- To develop soft skills like self-learning, group behavior, group ethics, and management

**ACTIVITY:**

- Skills and presentation skills as well as technical skills amongst students
- Students will understand and apply Bloom’s Taxonomy (Lower Order Thinking Skills to Higher Order Thinking Skills) in Engineering learning

**Day: 5**

Following is the list of various topics covered through PowerPoint presentation and videos on technical innovation and disaster:

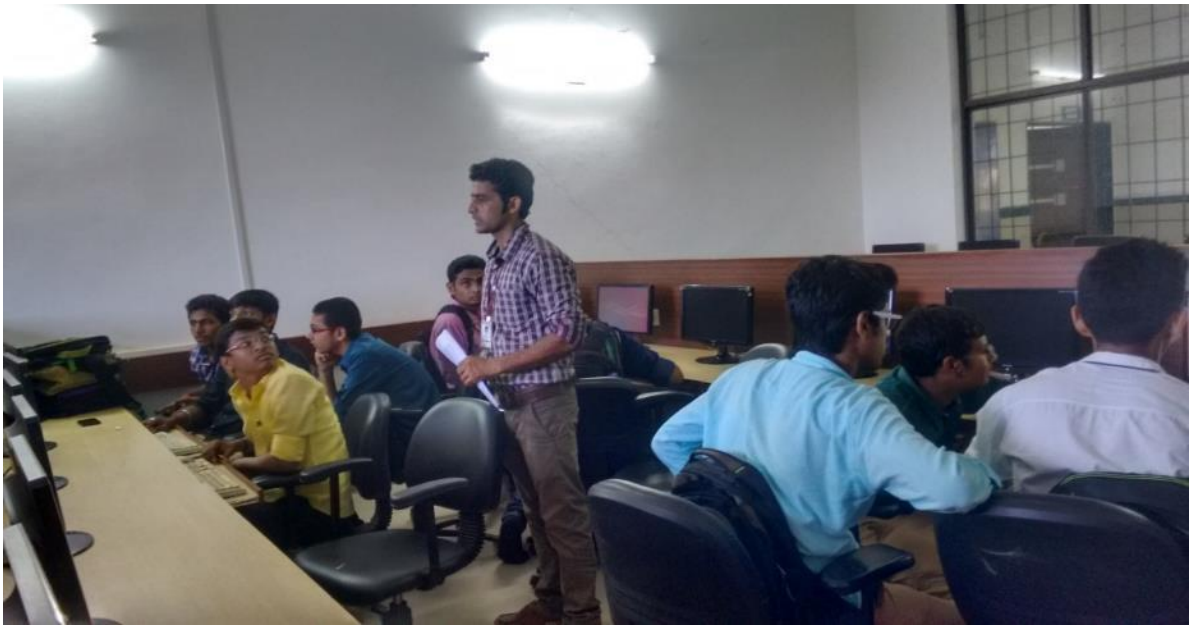
- Details of Technical Movie:

1. Construction of Burj Khalifa in different stages
2. Earthquake Proof Bridge Design
3. Social Networking
4. Gravity

- Details of Technical Disaster (Given by Faculty)

1. Presentation on Disaster
2. Presentation on Bhopal Gas Tragedy
3. Presentation on Earthquake Structural damage
4. Presentation on Tsunami
5. Presentation on Machhu Dam Disaster

- Providing steps to make the presentation
- Making of group of students[10 to 12 students per group] and allotment of topics (students can also search and decide the topic of presentation)
- Start gathering the information about the topic i.e. pdf documents, research papers, information on internet, videos, audios, animation etc.



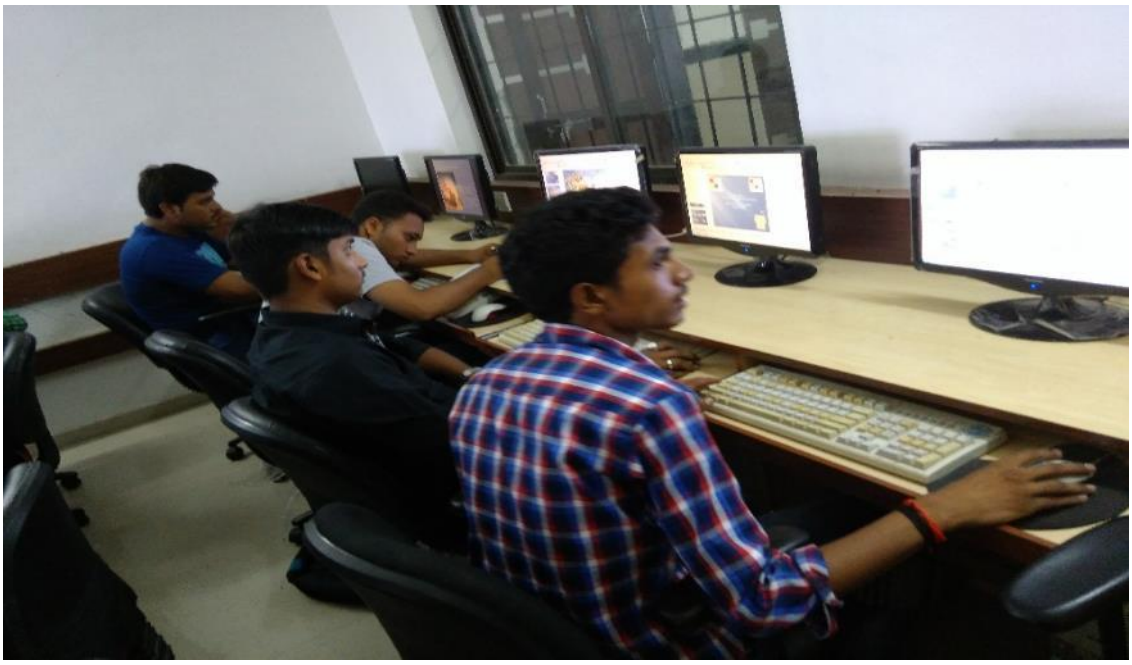
**Day: 6**

- Students discussed in groups, divided the given work, gathered information, understood concept and prepared presentation in the provided structure.

Students are making presentations in Computer Laboratory

**Day: 7**

- Preparation of the presentation for half day.
- Presentation by all the students in the provided structure of presentation.



Students are presenting their presentations

# Activity-3

# The History of Science and Technology (HST)

The history of Science and Technology (HST) is a field of history which examines how humanity understands the natural world (science) and ability to manipulate it (technology) has changed over the centuries. This academic discipline also studies the cultural, economic, and political impacts of scientific innovation. Histories of science were originally written by practicing and retired scientists as a way to communicate the virtues of science to the public. After World War II, extensive resources were put into teaching and researching the discipline, with the hopes that it would help the public better understand both Science and Technology as they came to play an exceedingly prominent role in the world. In the 1960s, especially in the wake of the work done by Thomas Kuhn, the discipline began to serve a very different function, and began to be used as a way to critically examine the scientific enterprise. Modern engineering as it is understood today took form during the scientific revolution, though much of the mathematics and science was built on the work of the Greeks, Egyptians, Mesopotamians, Chinese, Indians and Muslims.

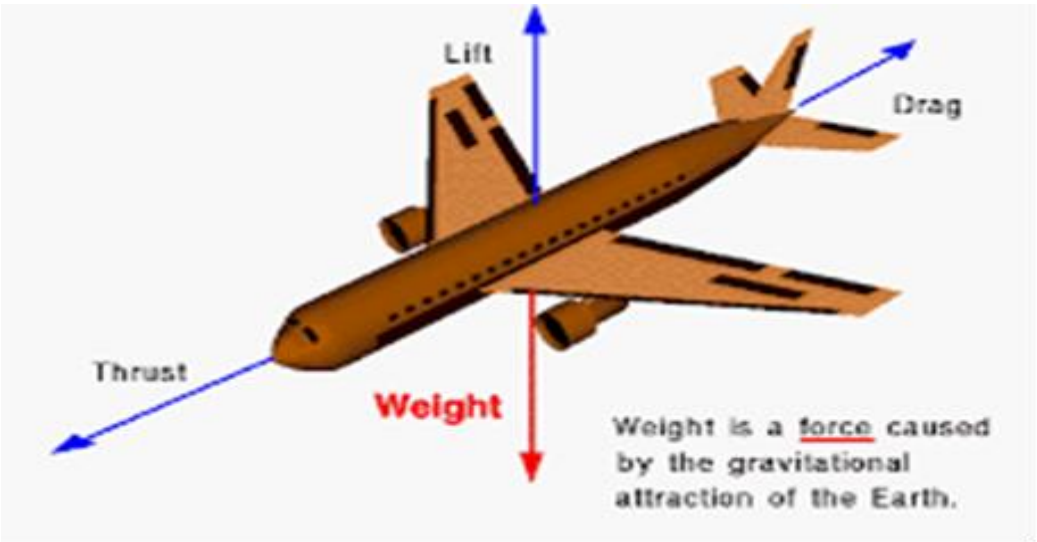
## Activity 1: To Prepare Paper airplane

As a part of bridge course planning, the Major activity 'History of Science and Technology' was classified in various twelve activities related to mathematics, basic sciences and various branches of engineering e.g. civil, computer and mechanical.

Just to provide stress free learning approach, various activities were discussed through real and animated videos, demonstrating the example of respective activities like gravitation force, magnetic levitation and preparing an airplane. This kind of teaching method encouraged the students to implement the practical application of basic science's laws and theory in practice. Students were encouraged through live examples of day to day life and instructed to design a question paper based on their understanding and grasping power.

**Topic name:** To prepare paper airplane

**Objective:** To prepare paper airplane and demonstrate the functioning.




**Description:**

The basic science behind the flying (lift, drag, thrust seen in above) and functioning of an airplane is always highly attractive and interested for the students. To fulfill the eagerness of the students, interesting ppts and videos were shown and interaction was done. Before starting the activity, in order to give the brief history of flying an airplane, students had been offered by a video of "Ancient Flying Vimana Recreated – Shivkar Bapuji Talpade". Subsequently basic concepts related to physics of flying an airplane e.g. Bernoulli's equation, Continuity equation, Newton's third law of motion and their applications. Then activity of making a paper airplane had been done by each group of students in the various steps and afterwards it was flown by them to measure the distance travelled and time of flight.

## Activity 2: Gyroscope

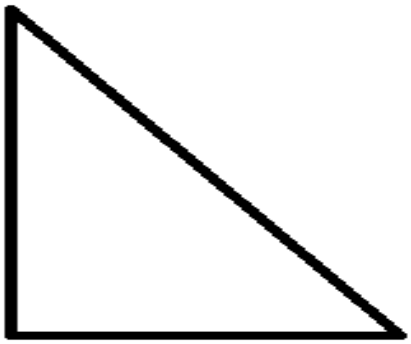
Gyroscope is a spatial mechanism generally employed for the control of angular motion of a body. Applications of gyroscopes are:

(1) For directional control e.g.
(i) Gyro compass: for air planes & ships.
(ii) Inertial guidance control system: for missiles & space travel.
(2) Gyroscopic effects are encountered in the bearings of
(i). an automobile when it makes a turn and
(ii) A jet engine shaft as the airplane changes direction.

The Gyroscopic effect with the actual model was explained in laboratory

## Activity 3: Finding the Value of π (Pi)

With the objective to establish a bridge between the things taught in the school and its usefulness in the field of engineering and in its application in daily life and in various fields, a bridge course activity was conducted in Gandhinagar institute of technology as per the syllabus designed by the GTU. In the Finding the value of pi, every class of each branch were divided into a group of 5-6 students. For each activity 2 hours were allotted. During this 2 hours activity in the 1st hour the students were explained the history of each activity and during the 2nd hour the students performed the activity and after the activity students got the importance and usefulness of Mathematics in real life as well as in engineering.



**<u>Topic- "History of Pi and finding the value of pi"</u>**

The Main objective of this activity is to make the students aware of the brief history of pi, finding its value and its application in various fields. It also includes how the value of pi is being used in finding circumference and area of circle. The value of pi is 3.1416.

3.14159265358979323846264 3
3832795028841971693993751
0582097494459230781640628
6208998628034825342117067
9821480865132823066470938
4460955058223172535940812
8481117450284102701938521
1055596446229489549303819
6442881097566593344612847

The value of pi was determined by the famous Indian mathematician and astronomer Aryabhatta (476 A.D.). Archimedes' results rested upon approximating the area of a circle based on the area of a regular polygon inscribed within the circle and the area of a regular polygon within which the circle was circumscribed.

The apparatus used by the students were: String, Pencil, Cutter, White paper Sheets

Each group of students was given the string of different length and was asked to draw the circles of radius equal to the length of the string. Based on this the students came to know that pi is the ratio of Circumference and the diameter. By taking the circles of different radius the value of pi obtained was the same.

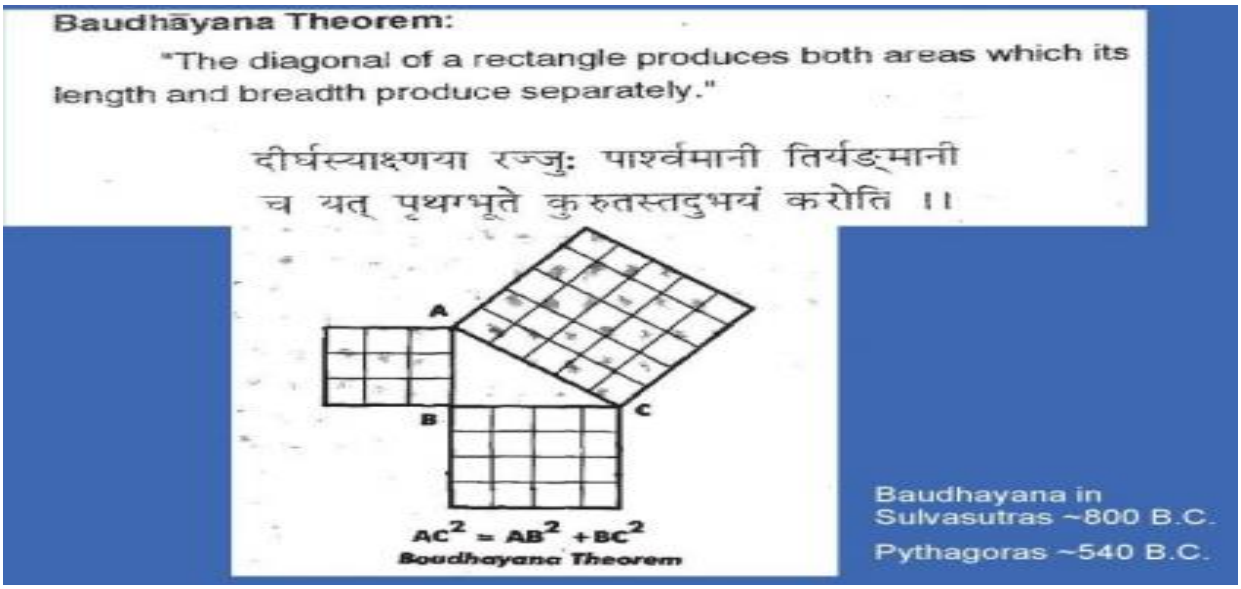
At the end of the activity the students came to know the real life applications of pi among which the some of them were:

- The double helix DNA revolves around pi
- Pi is rainbow
- Pi appears in colors and music.
- In studying the structure of pi

The current record of the decimal expansion of pi, if verified stands at 5 trillion digits.

## Activity 4: Pythagoras Theorem

The activity started with the statement of the theorem which is "The sum of squares of two sides of a right angled triangle is equal to the square of its hypotenuse." Students came to know that before Pythagoras actually gave the proof this theorem in 800 BC it was indirectly used by the Greeks and Indian mathematician Baudhayana had given a geometric expression of the same by drawing the squares on each side of a right triangle which is mentioned in the verse stated below:




Pythagoras gave the proof of this theorem using the area of squares and triangles.

Each group of students were given apparatus like White sheets, scale, pencil and were asked to draw a right triangle with different lengths.

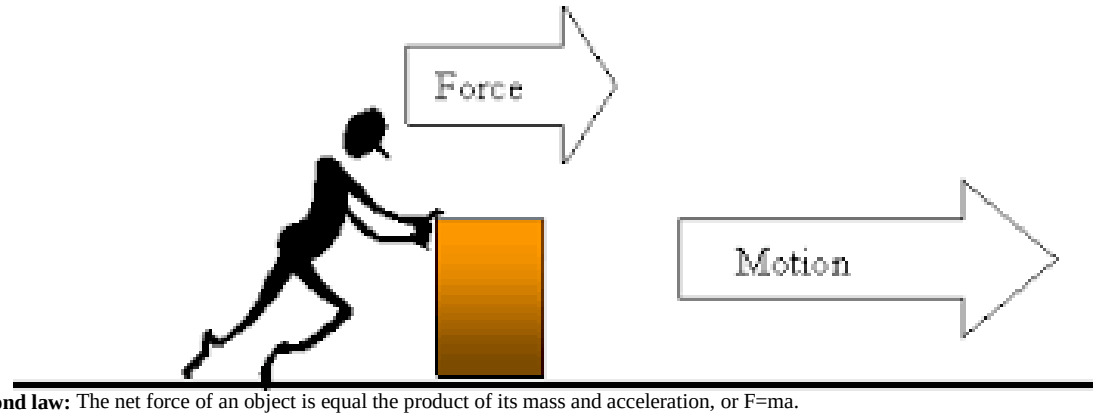

The students had thus verified the theorem. At the end students also came to know about the Applications of the theorem in the real life some of which are given below:

- While painting the wall using the Pythagoras theorem one can know how far the ladder of particular length should be placed in order to paint the part of the wall at particular height.
- The length and breadth of the TV or LCD screen can be measured using this theorem.
- In the construction of Building.
- In designing the Air Crafts.

## Activity 5: Newton's Motion Laws

***'Inertia is the tendency of an object to resist changes in its velocity whether in motion or motionless'.***

**Newton's First Law (law of inertia):** An object at rest will stay at rest, and an object in motion will stay in motion at constant velocity, unless acted upon by an unbalanced force.




**Newton's second law:** The net force of an object is equal the product of its mass and acceleration, or F=ma.

**Newton's third Law of motion:**

For every action there is an equal and opposite reaction.
According to Newton, whenever objects A and B interact with each other, they exert forces upon each other. When you sit in your chair, your body exerts a downward force on the chair and the chair exerts an upward force on your body.

## Activity 6: Gravitation Force

**Objective:** To know the how all object fall down to the earth with help of universal law.

**Description:** It is always interesting for the students that "How any two objects fall down at the same time in the null space?" To solve this question, physics behind gravitation and Newton's universal law gravitation were explained to the students through various videos. Afterwards activity based on gravitation had been done by the students and also the effect of air resistance on falling object on earth's surface was understood by them.

**Outcome:**
Students were able to understand the Universal law of gravitation. After completion of this activity they were able to design more activities for gravitational law.

## Activity 7: Earth Magnetic Field

To understand the magnetic field, the students understood what the field is, what the Electric field is, how the Electric field is generated and what the direction of the Electric field is.

After understanding of the electric field, students understand what Magnetic field is, how magnetic field is generated and what the direction of magnetic field is.

Based on the concept of Magnetic field, the students understood the magnetic field around the Earth and the magnetic field of the Solar system. The students also understood how the compass works and how the compass shows the direction using analog needle.

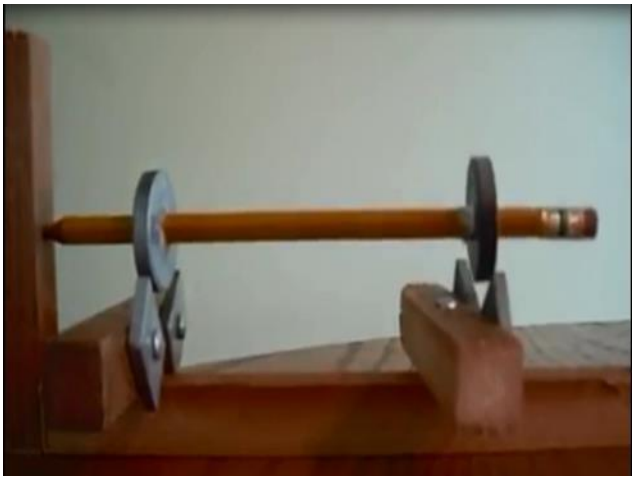
The magnetic field generates from the N-pole of the magnet and ends at S-pole of the magnet. Between the same poles repulsive force is present and between opposite poles attractive force is present. This concept of Magnetic field would elaborate by having on hand experiment by using two magnets and iron particles.

Figure 1: The Magnetic field covers certain area, shows the strength of the field. The Magnetic field generates from the periphery of the magnet and ends at the center of the magnets, which defines the N-pole and S-pole of the magnet respectively.

Figure 2: The N-pole of the first magnet generates the Magnetic field and ends at S-pole of the other magnet, shows the attractive force between two magnets.

## Activity 8: Magnetic Levitation

**Objective**: To understand the magnetic levitation phenomena

**Description:**

A Maglev train is the prominent topic of today's world and also the dream project of our honorable prime minister. It is always surprising for the students that "How an object can float above another without any physical contact?" To answer this question, fundamentals of magnetic attraction and repulsion was explained to the students through PowerPoint presentations and videos. Subsequently the concepts of electromagnetic levitation and superconducting materials were also explained to the students. Then the activity related to levitation provided by the magnets had been done by the students.

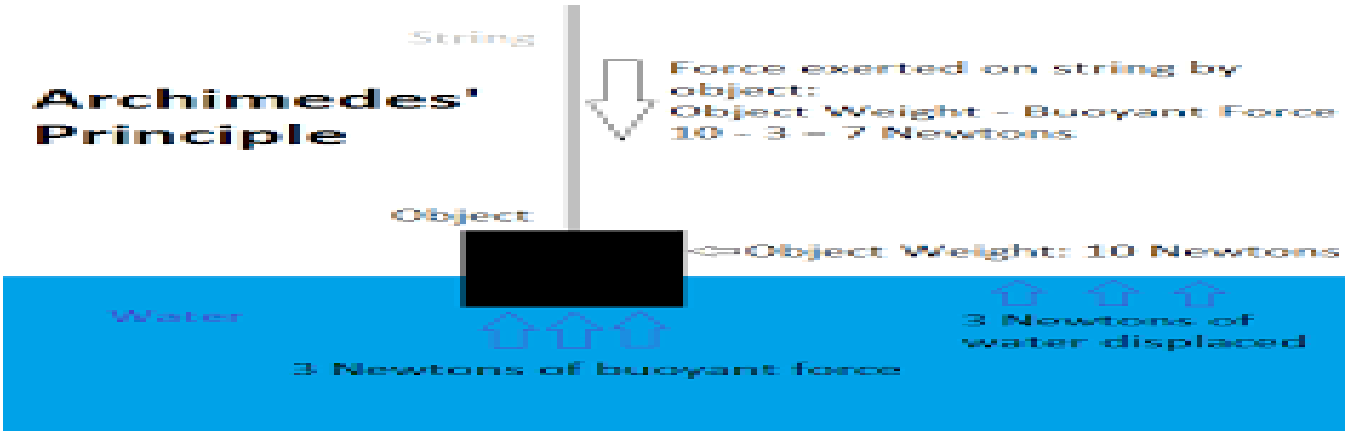
**Outcome:**

After completing this activity students learned to identify the difference between repulsion & attraction.

## Activity 9: Archimedes Principle

**Archimedes' Principle**, law of physics states that when an object is totally or partially immersed in a fluid, it experiences an up thrust equal to the weight of the fluid displaced.

The principle is most frequently applied to the behavior of objects in water, and helps to explain floating and sinking, and why objects seem lighter in water. It also applies to balloons in the air.




***Density and Buoyancy***

From Archimedes's Principle:

Buoyant Force = Weight of fluid displaced
= mg
= ρVg

Thus $F_B = \rho V g$

Where ……

$F_B$ = Buoyant Force or Upthrust

ρ = Density of fluid

V = Volume of fluid displaced or
The volume of the object that immersed in the fluid.

Buoyant force = weight, the object floats and stationary
Buoyant force > weight, the object moves up
Buoyant force < weight, the object moves down
Activity done for the floating and sinking of the body

Floating of the body

Body starts to sink

## Activity 10: Cryptography

**1) History of Computers:**

- Various generations of computer.
- History and application areas with advantages and disadvantages.
- Basic of Computer hardware, Software and Computer Languages.

- To make students aware about the role of Innovation in Computer Engineering.

**2) Cryptography and Network Security:**

- Introduce cipher text and plain text.
- Different types of attacks, attackers and cryptanalysis.
- Introduce Network and Types of security.
- Different types of encryption and decryption algorithms and where they are used in real time systems.
- Encryption Techniques include,
    - Substitution Techniques like Caesar cipher, Monoalphabetic Cipher, Play fair cipher etc.
    - Transposition Ciphers like rail fence and row transposition
    - Rotor Machine
    - Steganography

**3) Student Activity:**

A group of 5 students did the exercise to convert plaintext into cipher text with any technique.

## Activity 11: Town Planning

Students were given the introduction of interrelated fields which include Structural Engineering, Irrigation Engineering, Water Engineering, Town Planning and Estimations to get some basic knowledge about them. Then the topic was carried forward with the following parts in TOWN PLANNING:

**1. INTRODUCTION OF TOWN PLANNING**
The students were given a brief about the town planning with the definitions given by different authors and the ancient and modern technology associated with the town planning was also discussed in brief.

**2. OBJECTIVES OF TOWN PLANNING**
The objectives of town planning were discussed with the following points:

- Health
- Convenience
- Elegance / Beauty
- Environment

**3. PRINCIPLES OF TOWN PLANNING**

The principles of town planning were discussed with the following points:

- Housing
- Green Belt
- Civic Amenities
- Public Buildings
- Recreational Centers
- Road Systems
- Transport Facility
- Zoning

**4. NECESSITY OF TOWN PLANNING**

- The necessities of town planning were discussed with the following points:
- Traffic and Accidents
- Travelling time and Money
- Basic Amenities
- Inadequate open spaces
- Industrial Population
- Uncontrolled Development

**5. TOWN PLANNING IN ANCIENT INDIA**

- The topic was discussed with the following points:
- Indus Valley Civilization
- Vedic Period
- Buddhist Period
- Modern Period – Given an example of Gandhinagar, Gujarat.

**6. SURVEYS IN TOWN PLANNING**

The following points were discussed here:

- Preliminary Survey
- National Survey
- Regional Survey
- Civic Survey

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- Preliminary Survey
- National Survey
- Regional Survey
- Civic Survey

**7. ROAD SYSTEMS IN TOWN PLANNING**

The topic was discussed with the following points:

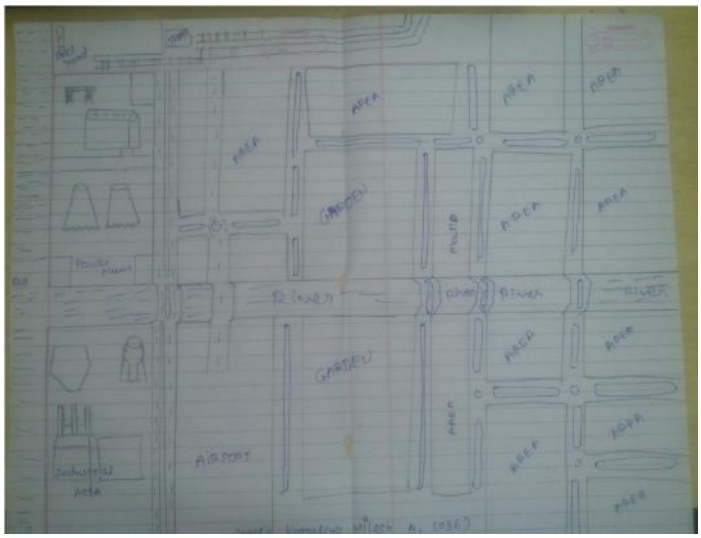
- Rectangular or Grid Iron Street System
- Concentric and Radial Street System
- Rectangular combined with Diagonal street system
- Rectangular combined with Radial street system

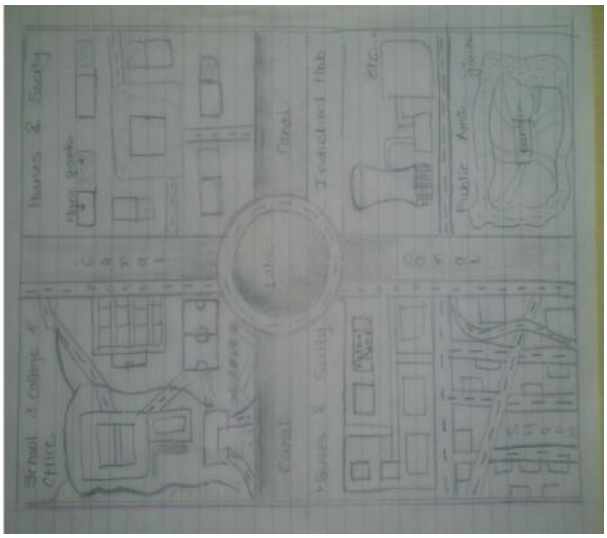
**8. SMART CITIES**

The Cities which were discussed in the topic were:

- Lavasa (Pune)
- GIFT CITY, Gandhinagar


**(*Radial Type Street System)***
The students were supposed to arrange the defined blocks on paper within given time.




***Town planning Drawing by students***

**OUTCOMES:**

- Students came to know what type of town planning, developed and satisfied the needs of diversity.
- Learned about Modern methods for master plan can be formed.
- Easy grasping and understanding of knowledge.
- Students were cultivated habit of promoting our culture at international level and enchant our mantras / principles of planning.

## Activity 12: Finding North using Astrological Knowledge

Students were given a brief idea about the Astrological jargons with their respective introduction that are used in the activity which include the following:

- Constellations are groups of stars that have become associated with a figure, and myth.
- The Big Dipper, the Little Dipper, and Orion are probably the best known and easily recognized constellations in the night sky.
- There are literally hundreds of constellations.
- Among these are the constellations of Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagittarius, Capricorn, Aquarius and Pisces.

The topic was covered with the following points:

**1. INTRODUCTION TO ASTROLOGICAL SCIENCE:**

- In past Indian people used stars to identify their perfect direction of traveling on earth and sea. There are so many references found where Indians were traveling to Andaman Island which requires in-depth knowledge of direction because Andaman Island is a group of very small islands far from Indian coast. In sea travel with this much precision is almost impossible without compass or other modern devices.
- The top two stars of Saptarshi are well known as a pointer to the Pole star (Dhruv).

**2. OBJECTIVES OF THE ACTIVITY:**

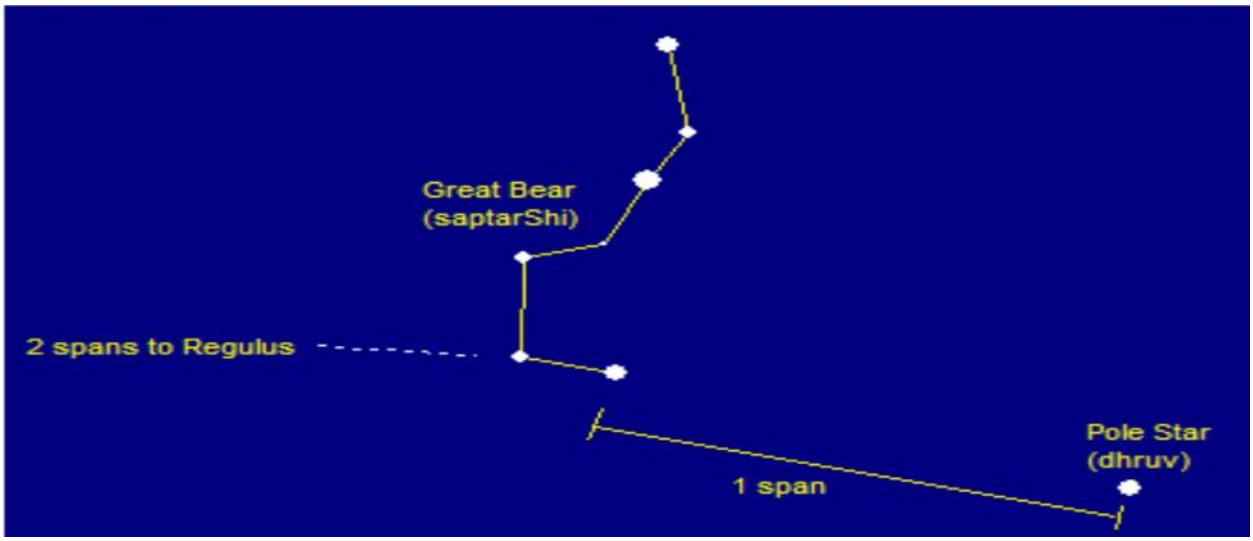
- To introduce the basics of Astrological Knowledge.
- To understand the Move and Rotation of Astrological Object in sky like Sun, Earth, Stars.

**3. ACTIVITY TO LOCATE THE NORTH DIRECTION:**

- Our activity was done to get the idea of finding direction towards north in night as it is difficult in comparison with day**.**

**4. STEPS:**

- Step-1: Find Great Bear (Saptarshi) as shown in figure. It is easy to find due to its large size and distinct shape
- Step-2: Find two stars that form the outer edge of the Great Bear (Saptarshi) as shown in figure.
- Step-3: Draw an imaginary line straight through the two stars of the bear edge about 1 span (the outstretched measure from the thumb tip to little finger)
- Step-4: This Pole (Dhruv) Star locate the North direction.




**4. OUTCOME:**

- Find North direction in night.
- Understand basic astrological concept.

# Activity-4
# Life Skills

**Course Execution and outcomes**

Life skills have been defined as “the abilities for adaptive and positive behavior that enable individuals to deal effectively with the demands and challenges of everyday life” (WHO). ‘Adaptive’ means that a person is flexible in approach and is able to adjust in different circumstances. ‘Positive behavior’ implies that a person is forward looking and even in difficult situations, can find a ray of hope and opportunities to find solutions.

Life skills include psychosocial competencies and interpersonal skills that help people make informed decisions, solve problems, think critically and creatively, communicate effectively, build healthy relationships, empathize with others, and cope with managing their lives in a healthy and productive manner. Essentially, there are two kinds of skills - those related to thinking termed as "thinking skills"; and skills related to dealing with others termed as "social skills". While thinking skills relate to reflection at a personal level, social skills include interpersonal skills and do not necessarily depend on logical thinking. It is the combination of these two types of skills that are needed for achieving assertive behavior and negotiating effectively. “Emotional” can be perceived as a skill not only in making rational decisions but also in being able to make others agree to one's point of view. To do that, coming to terms first with oneself is important. Thus, self-management is an important skill including managing/coping with feelings, emotions, stress and resisting peer and family pressure. Young people as advocates need both thinking and social skills for consensus building and advocacy on issues of concern.

The objectives of the domain will be achieved through the following strands:

1. Movement and Personal Growth

2. History and Heritage

3. Values and citizenship

4. Interpersonal Skills, Conflict Resolution and Emotion Management

5. Wellness and Self Care

The aims of Life Skills are to:

- Ensure that students understand the importance of a healthy and active lifestyle.
- Develop a range of movement and motor skills for a healthy and active life.
- Develop a range of interpersonal and social skills through games and activities.
- Develop an awareness of the past so as to understand the evolution of society to its present state.
- Inform students of their rights and responsibilities as active citizens for a sustainable development.
- Develop knowledge, skills and attitudes needed to preserve, appreciate and share our multiple cultural heritages.
- Develop skills to deter behaviors and lifestyles associated with crime, drugs and violence.
- Develop an atmosphere of peace and a sense of shared humanity. Demonstrate basic assertiveness strategies to manage interaction with others.
- Develop an understanding of the functioning of the human body.
- Develop action competence to reduce vulnerability to health problems.

- Through Life Skills learners are exposed to a range of knowledge, skills and values that strengthen their physical, social, personal, emotional and cognitive development
- Creative and aesthetic skills and knowledge through engaging in dance, music, drama and visual art activities
- Knowledge of personal health and safety
- Understanding of the relationship between people and the environment
- Awareness of social relationships, technological processes and elementary science

## Activity-1: To be Happy and Makes Others Happy

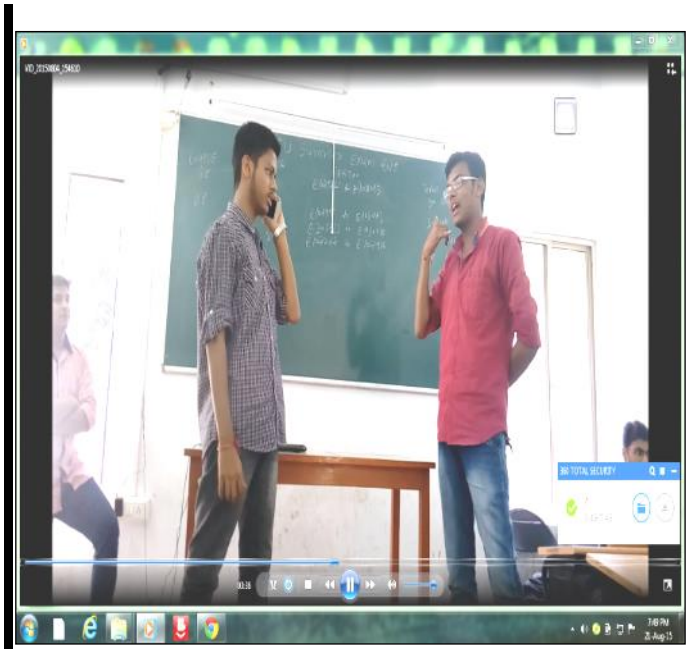
The main objective of this activity is to make the students aware about the sources of happiness. To fulfil this purpose, the students of all the divisions of the first year were indulged in different activities to improve the skills like interpersonal relationship, positive attitude, collaboration with others, etc. To understand the real meaning of happiness a video session on 'Happiness' created by Deepak Manchanda was arranged. After observing the video, students had discussed upon various sources of happiness and also narrated their own life experiences of happiness. The students also prepared various posters on different themes of happiness. They enjoyed a lot during this session. They also learnt how to create cheerful environment in their entire life.

## Activity-2 Anger Management

The 2nd activity that was conducted in the classes of Life Skills was Anger Management with an objective to make students capable to control their anger and to deal with it in a positive way so that the students can identify solution instantly. The activity taught them how to cope up with stress and other negative emotions. Students came to know about the difference between anger and aggression, the consequences of acts done in aggression and the way to use anger in positive manner for productive purposes instead of using it for destructive purposes were discussed in the classroom. The students were then instructed to prepare charts on the same. The activity remained very much fruitful as it taught them not only how to control their anger but also to cope up with different situations that make them angry in positive way by cultivating calm temperament.


## Activity – 3 Role Play

The 3rd activity of Life skills was Role Play that was to make students aware about the role of various characters so that they can appreciate and understand others' role in life. The students were divided into the group of 5 to 8. Students played different role very effectively and gave appealing performances on different issues and life situations by playing role play such as 'Students facing the day before result', 'Honesty is still alive', and 'Fraud Doctor, Corruption' etc. It was very much helpful to them to remove stage fear and enhance their interactive and performing skills, presentation skills and Imaginative Sympathy. Students liked this activity a lot and enjoyed throughout the session.



## Activity- 4 Ideas Matter

The 4th activity that was performed in the classes of Life Skills was Ideas Matter. In this activity different problems faced by students or the issues that they have witnessed in their and others' life were collected by the faculty and then one by one the problems were discussed with the students. Students tried to give possible solutions of those problems. In this session the students cultivated an insight in them regarding different problems. It cultivated their logical, critical, collaborative and problem solving skills.

## Activity- 5 Motivational Movie Club

The objective of this activity is to motivate the students to go beyond their capacity and develop "Can do" attitude and positive mindset. The students were divided into group of 8-10 according to strength of the class. Motivational videos like: "Bhagvad Gita Saar", "Life Vest Inside- Kindness Boomerang", "Never Give Up- Nic Vujicic" were shown in the Seminar hall. After the video, students discussed on the video in a group. They explained the video after discussion and also shared one story from their life when they were motivated by others.

# Thalassemia Awareness & Testing Program

In the recent study it is found that approximate 2% of Indian population (as per 2014 estimate) is carrying Thalassemia trait and it's on the rise. There are more than 5000 children who are on constant blood supply to stay alive. Hence it is very critical to take immediate steps to eradicate Thalassemia from the country. If we can prevent a Thalassemia Major Child born out of wedlock by pre-screening, we can eradicate the problem.

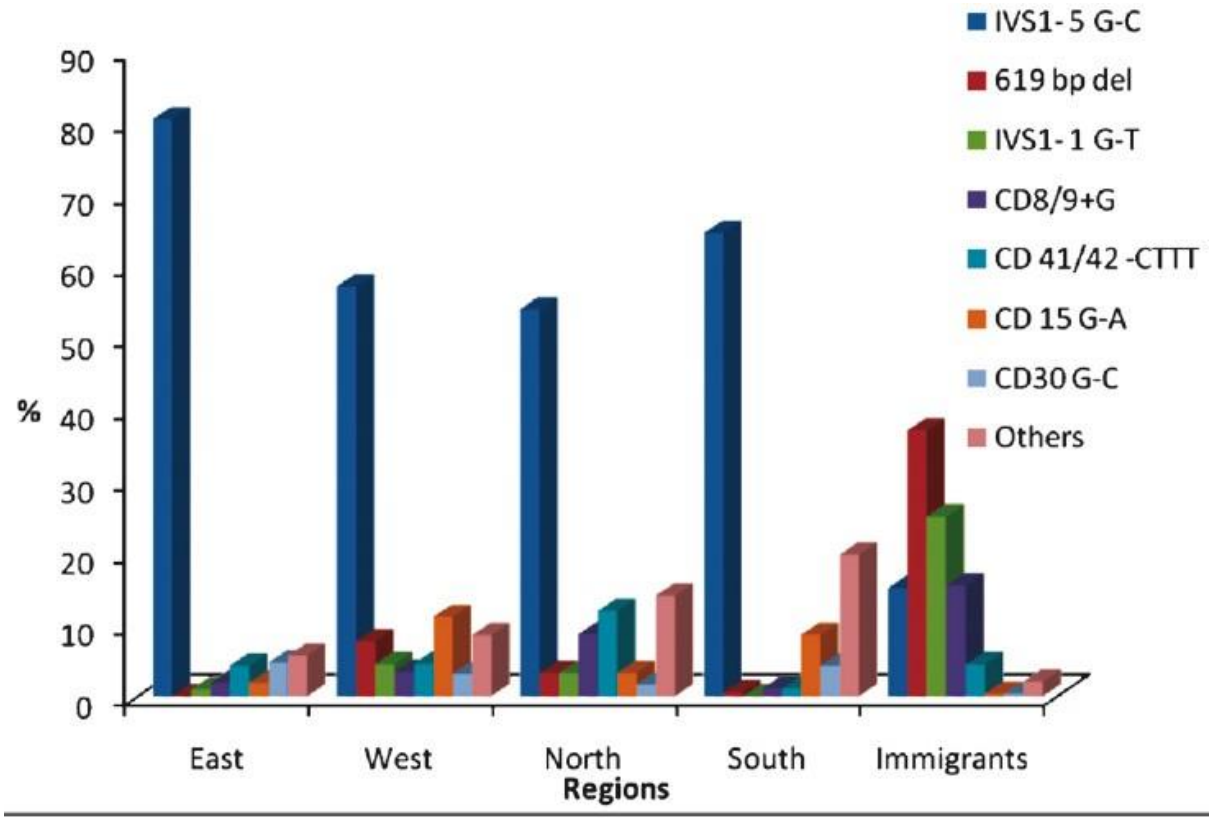


Figure:- Thalassemia (2014) survey by Indian Journal of Medical Research

Gandhinagar Institute of Technology has been actively involved in Thalassemia eradication program through awareness, screening and counseling within campus. GIT has appointed **Indian Red Cross Society** who has conducted Thalassemia awareness & testing programme. By this the Institute has not only educate the young generation but will make them cautious about the next safe step to prevent Thalassemia. Following are the details of the Thalassemia Camp.

| **Sr. No** | **Dates of Thalassemia testing** | **Total Number of students enrolled in the institute in 1st Year** | **No. of students tested for Thalassemia** | **Thalassemia Testing (% )** | **No of students having Thalassemia Minor** | **Date of Second counseling** |
|---|---|---|---|---|---|---|
| 1 | 20/08/2015 | 660 | 524 | 79.39 | Report awaiting | -- |



# YOGA

We all know that as a kid grows, it is very necessary for him/her to have control over their body and mind. So, as a small contribution towards the development of our students, we the entire team of Gandhinagar Institute of Technology had decided to organize a session on **Yoga** as a part of Bridge course for the first year students. The details are as follows:

**Day 1**: Monday

1. Introduction speech for Bridge Course and Life Skill Yoga
2. Prayer
3. Mind-Awareness Quiz game
4. Mind-Power Improvement exercise cum game
5. Clapping Exercise
6. Importance of removal of fear, stress, lack of confidence
7. Motivational Story
8. Omkar Chanting
9. Breathing Exercise
10. Group Meditation/ Cleansing-Healing Exercise

**Day 2**: Tuesday

1. Prayer
2. Mind-Power Improvement exercise cum game
3. Importance of Peace, Social strength, Unity, Self-confidence
4. Omkar Chanting
5. Breathing Exercise
6. Pranayama: Anulom-vilom Pranayama, Bhramari Pranayama, Bhrastrika Pranayama
7. Aerobic Dance Exercise
8. Zumba Aerobic Dance

**Day 3**: Wednesday

1. Prayer
2. Importance of Relationships, Time-management
3. Omkar Chanting
4. Breathing Exercise
5. Pranayama- Anulom-vilom Pranayama, Bhramari Pranayama, Bhrastrika Pranayama
6. Seating Asanas: Paschimottasan, Bhadrasana, Vakrasana
7. Aerobic Dance Exercise
8. Zumba Aerobic Dance

**Day 4**: Thursday

1. Prayer
2. Importance of removal of negative emotions and thoughts
3. Omkar Chanting
4. Breathing Exercise
5. Pranayama- Anulom-vilom Pranayama, Bhramari Pranayama, Bhrastrika Pranayama
6. Seating Asanas: Paschimottasan, Bhadrasana, Vakrasana
7. Standing asanas: Tadasana, Vrikshasana, Trikonasana
8. Aerobic Dance Exercise
9. Zumba Aerobic Dance

**Day 5**: Friday

1. Prayer
2. Breathing Exercise
3. Pranayama- Anulom-vilom Pranayama, Bhramari Pranayama, Bhrastrika Pranayama
4. Seating Asanas: Paschimottasan, Bhadrasana, Vakrasana
5. Standing asanas: Tadasana, Vrikshasana, Trikonasana
6. Aerobic Dance Exercise

7. Zumba Aerobic Dance
8. Internal Exam cum evaluation (Grade System)
9. Group Photo Session with cheer up closing ceremony


# Tree Plantation

Afforestation is the best way to contribute towards green and pollutant-free environment of our country. So, a small contribution was made by our students in this direction as well during the tree plantation activity of bridge course.