



Muffakham Jah College of Engineering & Technology

R&D NEWS

(For Internal Circulation only)

FROM THE EDITOR'S DESK....

Thousands of year's back, when the earth was ruled by wild summers and winters, and thunder and lightning, the first Inventor of human race sat on a rock, imagining and day dreaming about future. He wanted to run away from all the troubles... but did not know how?

Night descended and sky was full of stars and the big disc of moon. Looking at the moon, looking at the trees all around, he got an idea. Thus Wheel is born and the age of innovation and creativity started....

From the nature, we studied a lot. Then we controlled natural forces. We protected ourselves from rain by making our own house. We created food from seeds, we plant... We reinvented motion by creating wheel, discovering power and using ...

This long journey never ends. It is a continuous process and we are all part of this journey. When we introduce you to "Biofuel from Algae" to 'Human centrifuge', we are becoming part of this great journey... to better tomorrows!

Life at absolute Zero temperature?

Obviously, no life, as we know now, can exist at absolute Zero temperature! All materials- solid, liquid or gas- will have a different texture and appearance. For example, Oxygen will be a bluish white solid! Rubber will be brittle and mercury will look like hard silver. Hydrogen will be a liquid, which creeps at the sides of the container!

WHEN WE LOOK BACK...

Always look forward, but do not forget the path, already covered...

It is always necessary to know where we stand and remind ourselves about the Vision for MJCET, as conceived by our elders. It is 'to create a brand name MJCET at national level by imparting quality education and ensuring 100% placements, while building Institutional commitments in faculty and students'. The thrust areas are identified as Research and development and Consultancy services.

As per these guide lines, an R&D committee is constituted in 2007, senior Professors, representing each of the departments as members. It is decided to give seed funds to promising projects after discussion and scrutiny by the committee so as to give a thrust to R&D jobs with creativity and innovation in MJCET.

The idea of encouraging R&D among faculty and students is fully endorsed by SUES and budget is allotted for R&D activities. R&D budget has progressively increased as shown below.

2007- 08	: Rs 100,000
2008- 09	: Rs 100,000
2009- 10	: Rs 200,000
2010- 11	: Rs 500,000
2011- 12	: Rs 500,000

In the last 4 years, after the establishment of R&D cell, a number of new research proposals are have been generated and seed funds allotted to most of them. Most of the projects are application-oriented and aim towards improving the existing technologies to encourage innovation and flair for R&D in the minds of students to promote creativity and new ideas.

The projects before 2010-11 include:

1. Design of Robots for industrial automation
2. Design and fabrication of low cost wheel chair
3. Turning waste materials into fuel briquettes
4. Semi-automation of cranes
5. Development of finger print attendance record system
6. LPG gas sensor
7. Strength and durability of concrete mixed with Meta kaolin
8. Voice controlled wheel chair and
9. Studies on Machine tool vibrations during machining

It may be mentioned that the projects which are listed above do not include the research projects connected with the PhD works of faculty. A good number of faculty have registered for PhD and are busy with related research works.

There is a visible change in the mindset of faculty and students towards research and development now. An R&D atmosphere has set in. Most of the U.G/ P.G projects emphasize on critical analysis of the analytical/ experimental data. Many innovative projects have been taken up within and outside the realm of R&D cell.

In the first two years of R&D cell, most of the projects were short term research jobs, proposed by the faculty. In 2010-11, it is decided to encourage innovative student projects also by providing seed funds. The experiment was success and a few student projects got all round appreciation. They are described elsewhere. Another important step was installation of few solar powered street lights in the campus for demonstration, which has fuelled the interest in applications and use of solar energy.

In 2011-12 also, few innovative proposals have come up. It may be noted that the budget allotment for R&D activities have progressively increased. To avoid the restrictions of time period, the R&D allotment is on a 'rolling plan' basis now.

It is expected that an R&D atmosphere where innovative ideas, creative problem solving methods, PhD works of the faculty and publication of technical papers and presentations would prevail in MJCET due to the encouragement given to R&D activities. It is contemplated that research projects under AICTE and DST research promotion schemes would be taken up. It is hoped that the R&D cell would accelerate our march towards fulfilling the vision and mission of MJCET.

R&D ACTIVITIES DURING 2010-11

MJCET has established an R&D Cell to encourage the research oriented activities and develop an R&D atmosphere in the college among the staff and students. To achieve this, it has been decided to encourage research activities at all levels and include the promising student projects of BE and ME students also. During 2010-11, the following research proposals from UG students are selected by the committee as promising and financial aid given to encourage the creative genius and potential of the students.

1. Development of a human Centrifuge
2. Self sustainable home
3. Power walk
4. Extraction of Biofuels from Algae
5. Automation of Tig welding
6. Voice controlled Wheel chair

In a Review meeting, held on 11-5-2011, students presented the Projects to the expert committee. Projects 1, 2 and 3 and 6, which are completed, are well appreciated by the committee. The present status of the projects 4 and 5 are also presented. They are expected to be completed next year.

A brief description of the projects are given below:

1) Development of the Human centrifuge: (Internal guide: Mrs. Bushra Zuhor, Asst. Professor/ EEE)

The students have successfully developed and demonstrated the "Human centrifuge", used for training Pilots, Astronauts, and calibration of Instruments, used in space applications. It was run for 4g applications successfully.

2) Extraction of Biofuels from Algae (Internal guide: Mr.A.S.Reddy, Assoc Professor/ MED)

Algae is considered to be the 3rd generation biofuel since it does not require cultivable land for growth and is not edible. The amount of Biofuel yield is also higher and it is useful in the control of CO₂ in the atmosphere. Our students have selected and grown the suitable algae to meet these requirements and extracted biodiesel from the algae thus demonstrating the viability and advantages of Algae as a biofuel. The extracted biofuel will be used as an automobile fuel in the next stage of the work.

3) Power walk (Internal guide: Mr.Mohd Ismail, Asst Professor, EEE)

Piezo electric materials create electrical charge, when mechanically stressed or pressure is applied. It is possible to develop power from pedestrian/ vehicular traffic on the road and use it for street lighting. The students have developed a 'flooring', fitted with the necessary piezo electric materials, so that the application of pressure like walking can generate electricity and light lamps.

4) Voice controlled Wheel chair (Internal guide: Mr. Mohd Ismail, Asst Professor, EEE)

A control system, which is capable of moving the wheel chair on voice command, is developed. The system helps physically challenged people to operate the wheel chair by themselves and also to control the home devices like fans, lights etc. sitting on the chair. The controlling device is a Micro controller. The system is designed, fabricated and demonstrated.

5) Self sustained home (Internal guides: Dr. Ashfaque Jaffari, Mrs.Aijaz Fatima EEE)

This is an inter departmental project of BE students. The objective is to develop an environment friendly home using solar energy for lighting, natural ventilation for air circulation, rain water harvesting for drinking water and energy from biomass for domestic fuel needs. The design is ready and the actual fabrication is expected to be completed this year.

6) Automation of Tig welding (Internal guide: Mr. S.E.Khany, Assoc Professor/ MED)

The project aims at automation of Tig welding process. The project is expected to be completed this year.

Apart from the above projects, the following projects, done by our Final year students have won a lot of appreciation

1) Design and fabrication of Hovercraft (Internal guide: Mr.A.S.Reddy, Assoc Professor, MED)

A fully functional Hover craft is designed, fabricated and tested by the students. The hovercraft can handle a person and his baggage (200 kg). It operated with electric motor and fans/ blowers. Adequate lift from the ground and a reasonable velocity of the craft are the main design criteria. The project is to be continued with modifications like replacement of electric motor to make it run on regular road.

2) Conversion of a 4 stroke petrol engine to a 6 stroke engine (Internal guide: Mr. A.S.Reddy, Assoc Professor/ MED)

A 6 stroke engine is an engine with the exhaust stroke extended by 2 strokes for better utilization of the fuel. Our students developed a 6 stroke engine from a conventional 4 stroke engine by making necessary modifications. The engine is fabricated and tested. It is found that there is a reduction of 80% in the exhaust pollution at idling. And significant reduction of fuel consumption. In the next stage of the project, it is proposed to conduct performance tests at different load/ speeds.

3) Installation of Solar lights

Five solar lights are installed at various locations in the college, where lighting is inadequate. These proved to be a very good demonstration project on the use of solar energy. All lights are working well, demonstrating the use of non-polluting energy for everyday use.

Maximum and Minimum Temperatures

Sun's surface temperature is about 5650 C. Core temperature is much higher. These temperatures and heat are beyond human comprehension, you might say!

Not necessarily! The highest temperature reached so far in a laboratory is 950 million F, which is about 30 times the core temperature of the sun! What about the minimum achieved? We know that the lowest possible temperature is -273.15 C or 0 K. Scientists have produced a temperature of 280 pico K or 1/280 trillion F. Absolute Zero cannot be reached, as even at the lowest temperature, some molecular activity will be present. Temperature becomes absolute Zero only when there is Zero molecular movements!

HUMAN CENTRIFUGE

If your weight increases 10 times, what happens?

We know that Weight is the force with which your body is attracted towards the center of the earth by gravity. Due to this, you know that if your weight is 60 kg at present, it will be 10 kg in the moon. If your weight becomes 600 kg, what happens? Is it possible to make it 600 kg at all?

Exactly, this happens when you are inside a “Centrifuge”, which is widely used to give training to Pilots, and Astronauts, or calibrate the instrumentation for use in space vehicles.



Human Centrifuge developed by MJCET Students

When we divide gravity related research in human physiology, we can distinguish two main areas of research or application; the aero-medical research and the space related research. In the aero-medical field, gravity fluctuations are relevant in flying modern combat aircraft, where steep maneuvers at high speeds are crucial. It seems, the human being is one of the limiting factors in such systems. Both the cardiovascular and vestibulo-ocular systems are challenged to their limits, while going through the various combat maneuvers. The pilots have to be trained to rely on on-board instrumentation with regard to orientation and trained in special breathing techniques. They have to wear 204 Microgravity Sci. Technol anti-g suits to withstand the high gravity forces involved to support of their cardiovascular system. Related to spaceflight numerous experiments of some significant duration have been performed, first on board the Soviet Russian Salyut and later on the American Skylab in the early 1970s. These cosmonauts/ astronauts have been under near weightless conditions for several months and longer.

In order to produce conditions of changed gravity, a Centrifuge is used. Human centrifuges are exceptionally large centrifuges that test the reactions and tolerance of pilots and Astronauts to acceleration above those experienced in the Earth's gravity.

The use of large centrifuges to simulate a feeling of gravity has been proposed for future long-duration space missions. Exposure to this simulated gravity would prevent or reduce the bone decalcification and muscle atrophy that affect individuals exposed to long periods of freefall.

Large centrifuges are also used for the testing of fuel pumps that are employed in supersonic jets and space shuttles. Exposure to this simulated gravity would help prevent the failure of the pump during high ‘g’s. The compatibility of the fuel pump with number of ‘g’s can be found out.

Project Overview:

A centrifuge capable of giving up to 10g and testing human endurance under that is developed. Protocols for centrifugation typically specify the amount of acceleration to

be applied to the sample, rather than specifying a rotational speed (rpm). The acceleration is often quoted in multiples of ‘g’, the standard acceleration due to gravity on the Earth's surface. It may be remembered that two rotors with different diameters running at the same rotational speed subject samples to different accelerations. The Centrifuge is tested with human beings up to 4‘g’s and instruments up to 7‘g’s and the performance data is collected. The necessary improvements have been identified for future developments.

The project was successfully executed by the students Syed Khaja Hussain, Mohammed Iyazuddin Saad and Mohammed Abdul Waseem under the guidance of Ms. Bushra Zahoor (EED) Asst Professor, Department of Electrical Engineering.

MODIFICATION OF FOUR STROKE SINGLE CYLINDER PETROL ENGINE TO SIX STROKE (HEXI PLAGA) ENGINE

A six stroke engine to control pollution! Unbelievable! There was a time, when ‘more and more power, come what may’ was a slogan with people. They purchased huge Saloons for cars, these Gas guzzlers consuming lot of fuel, and polluting all around. After the first Oil crisis in 70s, cost of petrol and cost of pollution started getting attention. Today, they have become essential design criteria for the types of transport vehicles.

The 6-stroke engine, also called Hexi Plaga is developed based on this motto. It is known that a lot of energy is wasted in the exhaust gases of all I.C engines. In this engine, the exhaust stroke is extended by 2 strokes, to ensure complete combustion and up to 85% reduction in pollution! The engine is developed from a 4-stroke engine after making the necessary modifications and then tested to deduce the parameters like Efficiency and fuel consumption.

There are two different approaches, which can be used while developing a 6 stroke engine. The first approach is to provide two additional strokes by the main piston as fifth and sixth stroke. The second approach is to use a second opposing piston which moves at half the cyclical rate of the main piston. The former method is adopted here.



Hexi Plaga Engine & Team

Six Stroke (Hexi Plaga) Engine

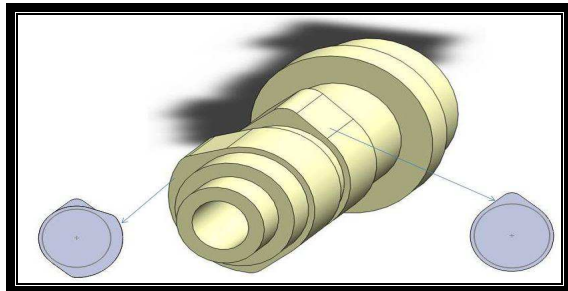
In the present project, a four stroke Honda engine is altered to form the six stroke engine. First four strokes are same as a conventional four stroke engine. In the fifth stroke, fresh air is sucked into the cylinder through a secondary air induction system. In the sixth stroke, air and unburned gases are expelled out completely, resulting in better scavenging.

The main engine parts, required to be modified in this case are Cam shaft, Cam Shaft Sprocket, Timing Chain and Engine Head, which are redesigned as required.

Cam lobes:- 360 degrees of Cam shaft rotation has been divided into 60 degrees among six strokes. Inlet valve open

in the first stroke only and the exhaust valve open in the fourth stroke and remains open till the end of sixth stroke. The exhaust valve Cam lobe has 120 degrees of dwell.

Secondary Air Induction System: - It supplies air for fifth stroke, recirculates a portion of exhaust gas to the carburetor and prevents the exhaust gases from re-entering the cylinder in the fifth stroke.



Exhaust Valve Cam Lobe Inlet Valve Cam Lobe

During the fifth stroke air is sucked into the cylinder through a non-return valve. A second reed valve at the exhaust manifold opens and removes the mixture of air and unburned gases. A third reed valve is provided to recirculate a portion of exhaust gases to the carburetor from forth and sixth stroke.



Altered Part of Engine Head

Working of Hexi Plaga Engine

I stroke: The inlet valve opens and air-fuel mixture from carburetor is sucked into the cylinder through the inlet manifold.

II stroke: Piston moves from BDC to TDC, both the inlet valve and exhaust valve are closed and the air-fuel mixture is compressed. The compression ratio of the modified engine is same as that of the original four stroke Honda engine 9:1.

III stroke: Power is obtained from the engine by igniting the compressed air- fuel mixture using a spark plug. Both valves remain closed. Piston moves from TDC to BDC.

IV stroke: The exhaust valve and the first reed valve opens to remove the burned gases from the engine cylinder. Piston moves from BDC to TDC.

V stroke: The exhaust valve remains open and the reed valve closes. Fresh air enters the cylinder through the secondary air induction line, provided at the exhaust manifold. The fresh air mixes with the hot unburned gases and expands partially; rest of the stroke is carried out by the inertia force of crank shaft and flywheel.

VI stroke: The exhaust valve remains open. The mixture of fresh air and un burn gases is expelled out to the atmosphere through the first reed valve in the exhaust manifold.

Advantages

The main advantages of the 6 stroke engine are experimentally found to be Reduction in fuel consumption, Reduction in pollution normally up to 80%, better scavenging and Lower engine temperature It is relatively easy to maintain the optimum engine temperature level for better performance. The engine does not require any basic

modification to the existing design. The technology and production methods remain unaltered

Conclusions:

The six stroke engine modification results in significant reduction in pollution. The fuel efficiency of the engine is increased and the valve timing can be effectively arranged to extract more work per cycle. Better scavenging is possible as air intake occurs during the fifth stroke and the exhaust during the sixth stroke. Due to more air intake, the cooling is improved. It enables lower engine temperature and therefore increases in the overall efficiency.

The project was successfully executed by the students Md Anwar Ali, Haq Mouzam, Shaik Raheem, Syed Abrarullah Hussainy and Mohd Ashraf Ali under the guidance of Mr. A.S.Reddy Associate Professor, Department of Mechanical Engineering.

A WHEEL CHAIR, TAKING ORDER FROM YOU!

It is often seen that the physically handicapped people find it difficult to operate the wheel chair themselves. They require the help of another person to move around in the house, thus defeating the very purpose of the wheel chair. If the wheel chair can be controlled by the voice of the user, all these troubles can be warded off. The following project attempts exactly this.

The project aims at designing a control system, which is capable of moving the wheel chair based on the voice command as well as manual control and wireless control of electrical home devices using Zigbee technology. The system integrates human-machine interface. It will be very helpful for physically challenged people to operate the wheel chair by themselves and to control the electrical devices like light and fans at home.

The main modules of the system are a) Speech recognition system, capable of recognizing the speech command by the user b) DC motors which are connected to the wheel, chair which helps the chair movement and c) a Relay used for switching the devices on or off.

Speech recognition is the process of recognizing the spoken word and initiates the necessary actions accordingly. The controlling device of the whole system is a Microcontroller. This system makes use of two Microcontrollers, one at wheel chair and other installed inside the house. The system with wheel chair has a speech recognition module, Zigbee transmitter and DC motors, interfaced to it. The Microcontroller gets the voice based input and judges whether the command is to control wheel chair or electrical devices and execute accordingly.



Voice Controlled Wheel Chair

The project is executed successfully by MD Mirajuddin (4/4 EIE), Afroz Fatima (4/4 EIE), and Lubna Tabassum (4/4 EIE) under the guidance of Mr. Mohammed Ismail, Sr. Asst. Professor/ EED

POWER FROM WALK TO LIGHT A BULB!

You go for morning walk or evening walk to burn a lot of calories or to spend power. But, can you get back power from walk? The idea looks fantastic! But the impossible is possible now, as proved by a group of students from Electronics and communication department!

Piezoelectric materials create electrical charge when mechanically stressed. The main aim of the project on Power Walk is to demonstrate that electricity could be generated from pedestrian and vehicular traffic.

When faced with dwindling natural resources and growing urban sprawl, Power Walk shows us a small step towards a more sustainable energy future.

Piezoelectricity is a naturally occurring phenomenon exhibited by certain materials that would generate electric current when force is applied. Power Walk designed here makes use of this unique material property to get a collective voltage of around 4V for each step taken, by converting the kinetic energy from foot traffic and other vibrations into electrical energy to glow a 50 watts bulb. The proprietary circuitry design maximizes the electronic signal and distributes electricity to its intended application or battery storage system.

A rugged flooring product is custom designed around the electronics to protect the sensitive components inside. Power Walk is the first attempt to take advantage of the unique properties of piezoelectric materials to actually produce usable energy.



Flooring with Embedded Piezoelectric Materials

The objective of the project is to recover part of the wasted human energy. The solution is a flooring system, converting the evening or morning walk into usable energy through the use of piezoelectric technology

The project is done by Rana Begum 4/4 EIE and Syed Masnoona 4/4 EIE under the guidance of Mohammed Ismail Sr. Assistant Professor E.E.D.

EXTRACTION OF BIOFUELS FROM ALGAE

One of the main problems faced by the common man seems to be cost of fuel. The increase in the cost of living can be directly attributed to the cost of fuel. Prices of all essential commodities and industrial products are directly or indirectly linked to the cost of fuels. It is clear that to achieve self-sufficiency and all round prosperity, cheaper fuels or alternate fuels are to be developed.



Biodiesel Developed from Algae

It has been shown that a good alternative to petroleum could be Biodiesel. Biodiesel can be produced from a variety of waste material or plantations. Studies are going on in using Biofuels- solid, liquid or gas effectively in industry.

It is observed that Algae could be a promising source of Biodiesel. A project is taken up to extract biofuels from Algae by the chemical process known as Algal CO₂ Sequestration. The project was successful and from the selected Algae, almost 500 ml of Biofuel was extracted. From the studies, the team has generated valuable field knowledge about the process.

The achievements of the project are summarized below:

- CO₂ absorption Algae photosynthetic activity growth (from 0.02 g of Algae, 400 g of dry Algae is grown)
- Harvesting of Algae (filtration)
- Drying of Algae
- Lipid extraction using Hexane solvent extraction method)
- Distillation to obtain Algal oil
- Comparison of vegetable oil and Algal oil by Gas chromatography

Transesterification of vegetable oil to Biodiesel and Testing of Bio diesel properties

The results agreed with ASTM D6751 standards. Due to the limitations of time, the testing of the Biodiesel in an engine could not be done. It is hoped that the tests will be done in due course

The main implications of the project are:

It is seen that the Algae has good CO₂ absorption potential, especially in the industrial areas, creating a cleaner environment.

There is a good potential for developing low cost fuel

The project is done by Abdul Wasay, Mohammed Umair Patny and Mohammed Abdul Qayyum under the guidance of Mr.A.S.Reddy (Associate Professor, MED), Dr. M.G.V. Satyanarayana (Asst Professor, Chemistry) and Ms. K.Sreedevi of Department of Pharmaceutical Microbiology, SUCP

THE DESIGN AND FABRICATION OF A HOVERCRAFT

Introduction

A Hovercraft is an air cushion vehicle (ACV), capable of moving or traveling over surfaces while being balanced on a cushion of slow moving and pressurized air, contained within a skirt, which is ejected against the surface below.

The primary purpose of the air cushion is to reduce the force needed to move the object, because the object is no longer in contact with the ground, thus reducing the surface friction. Hovercrafts are used throughout the world as specialized transportation. Since they are supported by a cushion of air, Hovercrafts are unique among all other forms of ground transportation in their ability to travel equally well over land, ice, and water. Small Hovercrafts are used for sport, or passenger service, while giant ones have civilian and military applications like transportation of cars, tanks, and large equipments in hostile environments and terrain. They can also be used after a natural disaster for emergency purposes.

Objective

The aim of the project is to design and fabricate a fully functional hovercraft, which is able to effectively handle the weight of a person and his baggage. The major criteria in design are:

- 1.) Adequate lift off the ground
- 2.) Measurable thrust or velocity values
- 3.) Ability to take turns in both left and right directions

Along with these basic criteria it is intended to make the craft as ecofriendly as possible by eliminating the use of any oil consuming and pollution-causing engines. It should also be visually aesthetic and appealing.

Description

Plywood is selected as the Hull material. The design enabled stability and more area to evenly distribute the entire weight of the craft. The plywood itself is light and rigid, and easy to work with thus satisfying all the requirements of a hull material. Filleting is done on all four corners of the hull for extra safety.

The skirt is selected on the basis of terrain encountered and the required efficiency of the hovercraft. A wall skirt design is chosen because it is easy to fabricate and is sufficient for use in Cities.. The material used is nylon cloth of 1mm thickness.

The lift system consists of a centrifugal blower directly coupled with an electric motor.

Blower Specifications:

Discharge = 0.75 m³/s, Pressure = 2200 N/m²

Power required = 5 HP at 2880 rpm



Hovercraft made by MJCET Students

The thrust system includes an axial flow fan coupled directly to an electric motor and enclosed within a duct.

The steering system consists of two rudders, a steering handle and metallic rods that form links between the rudders and the steering handle. The system is able to move easily while supporting the weight of the pilot.

The Hovercraft is tested successfully and demonstrated on the road.

The Project is done by Nabeel Sadat, Nikhil Kapoor, Sajjad Hussain, Mukarram Ali Khan and Ahmed Faizan Chisti,

under the guidance of Mr.A.S.Reddy, Assoc Professor, MED

LIGHT FROM THE SUN TO LIGHT UP STREETS IN THE NIGHT...

It is estimated that Earth receives 20 MW/Sq km from the Sun, which works out to be a staggering 170000 million MW of energy or 20000 times the present day energy consumption of the earth. The only problem with this renewable, nonpolluting, reliable and free energy is that it is very dilute and transient. The initial costs for taming the Sun for large scale power applications are so high that solar energy was considered a dead asset. When the cost of transportation and pollution connected with fossil fuels is realized, serious efforts to use solar energy started. From the low technology water heater to photovoltaic cells, it is a long distance, we have travelled. Invariably, any power application of solar energy is now linked to solar panels, made of photo voltaic materials.



One of the Solar Light installed in MJCET

Photo voltaic cells convert solar radiation directly to electricity. Each solar cell consists of two layers of semi conductor materials, one treated to have a positive and the other a negative charge. When excited by photons, electrons flow from negative to positively charged materials creating a current. A solar panel is thus capable of generating a significant amount of electricity.

The solar street light basically consists of a solar panel, storage facility for the generated energy and a light bulb, using the energy in the night. It proved to be a very good demonstration project on the use of solar energy.

5 solar lights are installed at various locations in the college,

SELF -SUSTAINED HOMES

Imagine a house, where the maintenance is completely free! You do not have to pay water charges or electricity charges, you do not depend on the gas supplier for cooking or you do not wait for the municipal water taps for your requirement of water! The house costs practically nothing, compared with the highly expensive flats and apartments, commercially offered! It looks like an Utopia, an ideal imaginary world for common man. We hardly realize that all these facilities are given by nature for free and it is the lack of willingness in our part to use it! Students of MJCET, under the guidance of the dedicated faculty of different departments proposed a project to realize this dream house and have made considerable progress too!

How this is achieved?

The house is designed with maximum scope for ventilation and solar lighting. Windows and doors are located suitably to achieve this. Use of slabs, bricks and solid chunks of concrete from rubbles from demolished buildings are used for construction.

Electricity is generated by roof-mounted wind mills. The wind mills have been designed, fabricated and tested. Cooking gas is provided by Biogas plants, run by the waste materials, generated in the MJCET itself.

Use of solar energy, collected by solar panels is planned to meet the requirements of lights and fans. The necessary electronics for this application is already developed.

Requirement of water is proposed to be met by rain water harvesting. It is known that, if the rain water can be collected from the roof and stored in an underground tank after filtering through an eco-friendly. Filter, made out of naturally occurring sand, bricks and stones., Other features of the self-sustained home includes use of LED lights, light sensitive regulation for LED lights, portable solar mobile charger, DC fans and LCD TVs. Required technical support is obtained from NIRD (National Institute of Rural Development) also for the efficient use of renewable energy.

IEEE FUNDED PROJECTS

The projects are executed by a group of students of III and IV years, from various departments like MED, Civil, EED, Electronics etc. The project is expected to be completed in 2011-12.

Institute of Electrical and Electronic Engineers (IEEE) has a scheme of funding student projects, which are innovative and benefit society on implementation. Under this scheme, the following student projects of MJCET are selected by IEEE for funding. These projects belong to three different categories of conservation of environment viz. solar photo voltaic, solar thermal and energy conservation.

- 1) Charging of UPS batteries in the Computer laboratories of MJCET (solar photo voltaic).
- 2) Generation of distilled water in the chemistry laboratories of SUES institutions (solar thermal)
- 3) Automation for Energy conservation, in MJCET buildings (Energy conservation)

All these projects are in progress and the basic works like preliminary design of the systems have been completed.

Ph. D./ P.G RESEARCH CENTERS IN MJCET

It is proposed to start PhD/PG research centers in various engineering/ science departments of MJCET to encourage the research activities leading to higher degrees. Initially, the research centers will be set up in the mechanical and civil engineering departments. **Dr. Nawazish Mehdi** of the Department of Mechanical engineering is coordinating the works, connected with the research centers.

R&D COMMITTEE

- 1.) Prof.Dr. Basheer Ahmed (Principal and Chairman of the committee)
- 2.) Prof .Dr. Veerabhadra Rao (IT)
- 3) Prof. Dr. Mrs.Kaleem Fatima (Head, ECE)
- 4) Prof. Dr. A.A.Moiz Kahiser (Head, IT)
- 5) Prof. Dr. Syed Nawazish Mehdi (MED)
- 6) Prof. Dr. Moinuddin Ahmed (CED)
- 7) Prof. Dr. Y.Arun Kumar(Head, Chemistry)
- 8) Prof. Dr. Shaik Zameeruddin (Physics)
- 9) Prof. Dr. Seetharamaiah (MED)
- 10) Prof. Dr. Z.A.Raheem (Civil)
- 11) Prof. Dr. M.P.Soni (Head, EEE)
- 12) Prof. Dr. Ashfaq Jafari (Vice Principal-Acad.)
- 13) Prof. Syed Ferhathullah Hussainy (Vice Principal-Admn.)
- 14) Prof. Dr.K.N.Krishnan (MED) Convener

GREEN HOUSE EFFECT

Do you know that the Green house effect has nothing to do with greeneries or house? When the atmosphere has too much of CO₂ gas, the layer of gas acts like a glass with disastrous effects. The phenomenon is called the Green house effect.

When you open your car, parked outside on a sunny day, you feel that the temperature inside the car is much more than outside! This is because of the property of glass to admit radiations of large wavelengths inside, but inability to reflect the same back to atmosphere. As a result, the temperature of air inside is much higher. Due to pollution, when the CO₂ content of the atmosphere goes up, a similar phenomenon takes place. The CO₂ gas acts like a glass shield.

Thus, the greenhouse effect is the process by which thermal radiation from a planetary surface is absorbed by atmospheric greenhouse gases like Co₂ , and re-radiated in all directions. Since part of this re-radiation is back towards the surface, energy is transferred to the surface and the lower atmosphere. As a result, the average surface temperature is higher than it would be if direct heating by solar radiation were the only warming mechanism.

Solar radiation at the high frequencies of visible light passes through the atmosphere to warm the planetary surface, which then emits this energy at the lower frequencies of infrared thermal radiation. Infrared radiation is absorbed by greenhouse gases, which in turn re-radiate much of the energy to the surface and lower atmosphere. The mechanism is named after the effect of solar radiation passing through glass and warming a greenhouse, but the way it retains heat is fundamentally different as a greenhouse works by reducing airflow, isolating the warm air inside the structure so that heat is not lost by convection.

The existence of the greenhouse effect was suggested by Joseph Fourier in 1824. The idea was further strengthened by Claude Pouillet in 1827 proved experimentally by John Tyndall in 1859.

If an ideal thermally conductive blackbody was the same distance from the Sun as the Earth is, it would have a temperature of about 5.3 °C. The earth reflects about 30% of the incoming sunlight only and the planet's effective temperature could be about -19 °C, about 33°C below the actual surface temperature of about 14 °C or 15 °C. The mechanism that produces this difference between the actual surface temperature and the effective temperature is due to the atmosphere and the greenhouse effect.

Earth's natural greenhouse effect makes life as we know it possible. However, human activities, primarily the burning of fossil fuels and clearing of forests, have greatly intensified the natural greenhouse effect, causing global warming.

CONSULTANCY CELL

Industrial Consultancy along with Sponsored Research is the backbone of knowledge advancement for the faculty of Technical Institutions. MJCET has established a 'Consultancy Cell' as a means of offering organized consultancy services to the Industries and Governmental Organizations who are in need of expertise in various areas of Engineering and Technology.

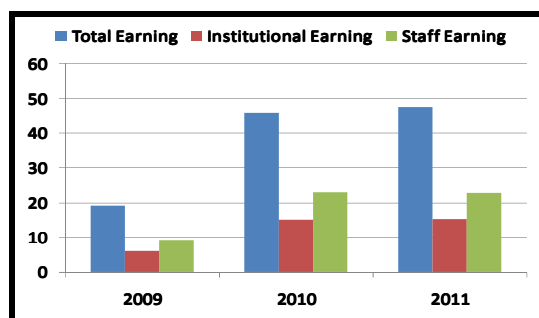
The Consultancy cell offers two types of services:

- i. Quality Control, Material testing and field / laboratory investigation services
- ii. Engineering Design and Experimentation services

Besides high quality teaching at both UG and PG levels, the various Departments of the Institution are well equipped to undertake basic as well as advanced consultancy services and applied research in both established and upcoming sectors of Engineering and Technology.

At present, the Civil Engineering Department, with its multifaceted and experienced faculty, has established strong linkages with the Governmental and Infrastructure Industry Sectors through sustained services in the area of project design, quality control, testing and evaluation and training in new areas of Civil Engineering Infrastructure development. Some of the projects undertaken by the Department are as follows:

- i. Topographic survey and alignment of flyover in Vijayawada City for VGTM-UDA in association with NIT, Warangal
- ii. Preparation of Topographic Map for Gangavaram Green Field Port in Visakhapatnam for Gangavaram Ports Limited.
- iii. Topographic Surveys of 12 radial roads connecting outer to inner ring roads in Hyderabad City for HUDA
- iv. Rural Water Supply Scheme in the villages of Bidar District, Karnataka State in association with DHV Consultants, New Delhi
- v. Investigations for Bearing Capacity of Soil, Ground water exploration etc. for private clients and organizations
- vi. Evaluation of the Structural Stability of cellular towers for GHMC, Hyderabad
- vii. Third Party Quality Control of CC and BT Roads for GHMC, Hyderabad
- viii. Apart from the Civil Engineering Department, the Mechanical Engineering Department is also involved in industrial consultancy work. The Institution is now supporting and encouraging consultancy projects in the other Departments like the ECE Department and the Electrical Engineering Department.
- ix. The earnings from consultancy have been improving over the years. For the year ending 2010-2011 the total earnings from consultancy stood at Rs. 47.65 lakhs and the earning to the college at Rs. 15.26 lakhs. The figure below depicts the consultancy earnings over the last three years in lakhs of Rupees.



Earning from Consultancy over 2009-2011

Highest and lowest speeds!

We know that the highest possible speed is Speed of light (300000 km/s) and this is the favorite speed of science fiction writers. What happens to people travelling at the speed of light is only scientific imagination!

On the face of the earth, do you know the speed of a Snail? A moderate 15 cm/hour!

Longest movie in history!

If a movie is more than 3 hour long, we might say, it is a long movie. Some movies are made in 3 parts. But the longest movie, ever made is 85 hours long! The movie, 'Cure for Insomnia', is directed by Dr. John Tummins. For the first (and probably the last!), it was shown at Art Institute of Chicago in 4 days!

For the budding researchers...

Here are some Laws of research!

FIRST LAW

If an experiment works, something has gone wrong!

SECOND LAW

No matter what the anticipated result, there will always be someone eager to a) misinterpret it b) fake it or c) believe it happened to his own pet theory.

THIRD LAW

In any collection of data, the figure most obviously correct, beyond all needs of checking is the mistake.

FOURTH LAW

Once a job is fouled up, anything done to improve it only makes it worse.

Science and Literature: Comrades in arms?

It is believed that science and literature are like two parallel lines- they never meet! But, do you know that the first reference to cryogenics appeared in literature, much before the idea struck a scientist? In 'Gullivers travels,' (Jonathan Swift, 1726) a passage runs as follows, which is clearly a reference to cryogenics...

'He (the universal artist) told us he had been, for 30 years, employing his thoughts for the improvement of human life. He had two large rooms full of wonderful curiosities and 50 men at work. Some were condensing air into a dry tangible substance by extracting the Nitre and letting the aqueous or fluid particles to percolate'

Strange but true, a lot of modern gadgets were sketched by Leonardo da vinci in his drawings (15th century). H.G.Well's imagination of space travel came much before a scientist thought of it. It is seen that a number of great scientists are artists themselves. So, the present thinking is that science and humanities are comrades in arms and not 'enemies in arms' !

From a Desperate researcher...

RULES FOR RESEARCH

To study a subject best, understand it thoroughly before you start!

Always keep a record of Data- it indicates you have been working!

Always draw your curves, then plot your readings!

In case of doubt, make it sound convincing!

Experiments should be reproducible- they should all fail the same way!

Do not believe in miracles- rely on them!