



# Dronacharya College of Engineering

ISSUE

vol v issue xlv

## MECHANICAL ENGINEERING DEPARTMENT

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### From Editor's Desk :

*"April is the cruellest month,  
breeding lilacs out of the dead.  
Land, mixing memory and desire,  
stirring dull roots with spring rain".*

*(T. S. Eliot)*



Nature is the best educator. It is universal, absolute and non-contradictory in its traits. We intend every Dronacharyans to inherit its completeness.

**Dronacharya College of Engineering** is efficient, virtuous and resourceful in providing excellent, competitive Technical Knowledge with conducive environment to learning. Each of us, whether a student or a staff member, feels proud to be associated with DCE, one of the largest, most progressive and adaptable college in the field of Engineering and Technology. We, at DCE, make unconditional opportunities available to students for self-transcendence and enlightenment. Our focus is on cultivating and harmonizing capabilities in each student. We always encourage the students to set their own standard beyond our expectations.

We counsel all students to develop a personal code of conduct aligned with healthy social and moral values that integrate their mind, body and soul in order to help them making sound decisions and choices. We imbibe positive and infallible energies from our generous management, the powerful energizer, **Hon'ble Dr. Satish Yadav, Chairman, Dronacharya Group of Institutions** who enlightens us dispelling our ignorance and building confidence in us to serve the Nation and Society.

I am also thankful to our **Hon'ble Principal, Prof (Dr.) B. M. K. Prasad** for his consistent inspiration, ever growing motivation and valuable suggestions.

*Editor, (Dr. Sunil K. Mishra)*

*From HOD's Desk :*

**"Self Improvement first helps you realize how good you already are and then it lets you enjoy becoming even better. It is necessary to try to surpass oneself-always. In fact, this occupation ought to last as long as life. "**



We are undeniably very happy to upload the newsletter of April 2010 from Mechanical Engineering Department. Our Department is one of the leading departments providing highly Technology-oriented Programmes to meet today's challenges of young minds.

This department has highly qualified, experienced and dedicated teaching faculty to impart knowledge in various fields including recent technologies helping students to take on any problem related to Mechanical Engineering, a field in which kaleidoscopic changes are occurring incessantly opening new avenues, unraveling new vistas and extending the horizons of knowledge with every passing day.

With the right mix of creative talents, use of Innovative Technologies and strong relationships with various Industries, we adopt quality methods of teaching that help students to enhance their knowledge, understand the importance of being leaders in the area of their interest and provide them with an unbeatable edge to success in today's demanding work place and global market. The frantic efforts made in this direction never go in vain. **Our students have secured top positions in the merit list of Maharshi Dayanand University, Rohtak.** As a result they have been successful in achieving their target of joining reputed companies or heading for esteemed institutions across the globe.

I ardently admire the Faculty and supportive staff members who work in an exemplary team spirit enabling the Department to grow from strength to strength and also hope they will continue with the same zeal.

We, as strong components of DCE rededicate ourselves to the saintly Mission of edifying our college a Role-Model for other colleges. We are sure that we shall thrive under the guidance and ever willing support of **our Hon'ble Principal, Prof. (Dr.) B. M. K. Prasad and meticulous Dean Academics, Prof. (Dr.) Onkar Singh.**

*Head of Department (Prof. (Dr.) D. S. Sharma)*

*Sports :*

Inter-departmental matches were organized in team games of Volleyball, Basketball and Cricket. Each department fielded two teams viz. seniors and juniors. Teams from Mechanical Department emerged as winners and runner up in volleyball and basketball. Juniors' team emerged as winner in cricket match.



**The jubilant Basket Ball team with the Chief Guest, Hon'ble Chairman & Dynamic Principal.**

*DronTech-2010 :*

- **Neeraj Yadav** (Roll No.9236) Semester-VIII of our department has secured third position in "**Paper presentation**".
- **Kavita Gambhir** (Roll No.11288) Semester-IV of our department has secured second position in "**Poster presentation**".
- **Hitesh Yadav and his team** (IV Semester) of our department has secured first position in "**Junkyard event**".



**Vidya Sagar Chauhan (Roll No.10326) Semester-VI of our Department receiving First prize in "Autocad Event".**



**Hitesh Dhanda and his team receiving first prize in "Project Exhibition" from Hon'ble Chairman.**

## Lab Updates :

New CAD software Pro-e wildfire-5 with 52 modules has been procured and installed in CAD lab. A training session to the faculty and non teaching staff members was organized to impart knowledge on use of this software by Messrs Adroitec.

## Live Projects Undertaken By Students :

### Gareeb Geyser Cum Heater

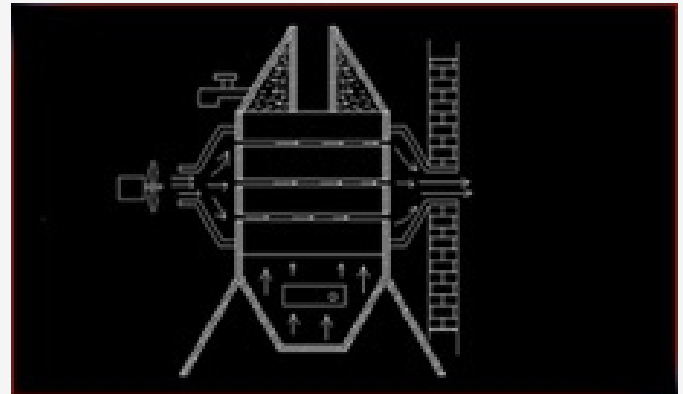
There is a lot of shortage of electricity in villages and also they can not afford a huge amount on heaters and geysers. This device will work on conventional fuels (cakes of cow dung, waste paper, & other farm wastes etc). It's very simple in design and very economical if made in mass production. The device works on the principle of Heat Exchanger where heat from hot fumes is extracted to heat the air which is passed into the room and to heat the water which is stored in the container attached to it. Maximum heat is extracted from fumes and danger of harmful gases is minimized. This project can be used in very large scale in rural areas where thousands of people suffer due to cold and harmful gases like CO every year.

#### Project Guide

Prof. (Dr.) D. S. Sharma

#### Team

- Prof. (Dr.) D. S. Sharma
- Jasmeet Singh (9225)
- Gulshan Gupta (9228)
- Prince Kumar (9243)
- Ravi Yadav (9248)
- Sandeep Kumar (9257)



### Automatic Automotive Air Refilling System

Automatic Automotive Air Refilling System is designed to cater to safety requirements during driving of automobiles when its wheel gets deflected owing to puncture of tube. Our automobile is under load conditions because the pressure of air in tyres is less than required due to which engine does not work properly. Automatic Automotive Air Refilling System design is aimed at not only to fill the air in the punctured tyres automatically but also maintain the pressure of air in the running automotive. It also avoids damages in tyres. This system ensures that air pressure in the punctured tyres will be maintained in such a way that embedded particle is sealed (locked) in between tyre and tube i.e. layers of tyre & tube and punctured particle are coupled due to internal force in the tube. Automatic Automotive Air Refilling System will be a boon to the passengers as it will avoid serious accidents and also save the tyre and tube from being totally damaged.

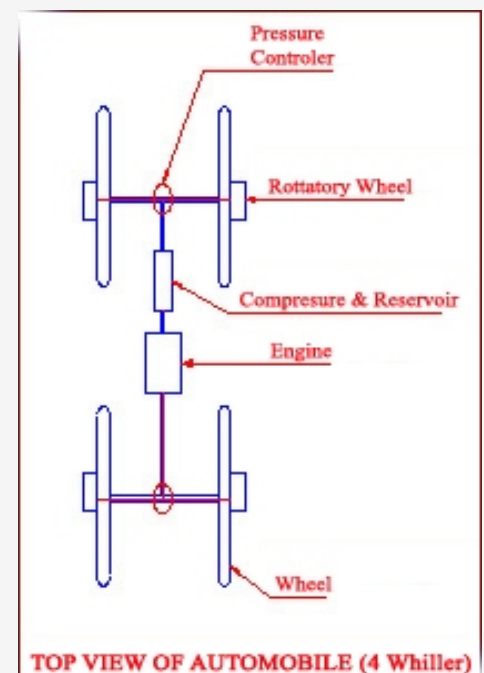
This system will also ensure the proper air pressure in tyres and thus result in fuel economy. This system will be very handy in cases of automobiles being driven by a lady or only one passenger as the driver.

#### Project Guide

Mr. Achin Srivastav

#### Team

- Mr. Achin Srivastav
- Hitesh Dhanda (9230)
- Parveen Kumar (9978)
- Pradeep Kumar (9981)
- Vinay Kumar (9983)



## Generation of Electricity Using Solar Powered Stirling Engine

A Stirling engine is a heat engine that operates by cyclic compression and expansion of air or other gases (working fluid) at different temperature levels such that there is a net conversion of heat. The general cycle of a Stirling engine consists of compressing cool gas, heating the gas, expanding the hot gas, and finally cooling the gas before repeating the cycle. The working fluid inside the Stirling engine in this case is heated gas using solar energy from the sun.

The main Component of this projects are:

- Stirling Engine
- Parabolic Dish
- Solar Tracker
- Alternator

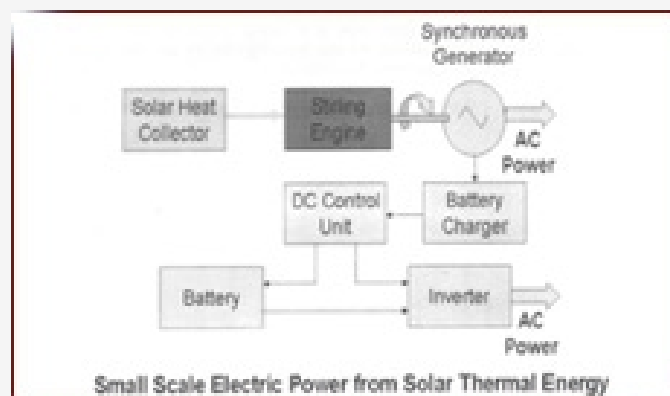
The parabolic dish which acts as a solar concentrator, concentrates heat of the sun on the receiver of the Stirling engine which causes the expansion of the gas contained in it. It is the receiver end of the Stirling engine, which contains the working fluid. The receiver end of the engine is placed at the focus of the parabolic dish so that it can receive the maximum amount of energy that is concentrated by the dish. The expansion/movement of the working fluid inside the engine causes crank to rotate. The crank is coupled with an alternator which will generate the electricity. The movement of the parabolic dish along with the sun is synchronized using a solar tracker. Just like the sun flower, a solar tracker turns towards the sun, in order to maximize solar radiation incidence.

### Project Guide

- Mr. Rajesh Arora

### Team

- Ankit Gosain (9215)
- Anupam Lahiri (9216)
- Bhanoo Chabra (9221)
- Sahil Pruthi (9255)
- Utkarsh Singh Sambyal (9267)



### Technology Focus :

## Relaxation of Compressive Residual Stresses

Heavier materials are being placed with aluminium alloys having high strength and stiffness to weight ratio, excellent corrosion resistance, good formability, weldability and recycling potential for applications in aerospace and automotive. Residual stresses exist in a structural component prior to application of external forces. Beneficial compressive stresses can be added to structural component by shot peening, laser peening, low plastic burnishing, ultrasonic impact treatment and deep rolling to increase fatigue life.

Shot peening is very simple and cheaper method to enhance fatigue life of metals and alloys, such as aluminum. Compressive residual stress reduces surface crack growth due to fatigue. Mechanical and thermal process causes residual stress relaxation during component service. There have been several investigation about relaxation behavior of residual stresses for thermal exposure, static loading, cyclic loading and thermo-mechanical loading conditions. During fatigue cyclic load, residual stress relaxation can be divided into following stages.

- Relaxation due to surface yielding under initial cycles.
- Gradual relaxation under subsequent cycles.

In these stages, residual stresses of shot peened specimen decrease considerably when compared to those with no fatigue cycles. When measured, residual stresses relaxation of shot peened specimens using X-ray diffraction techniques and proposed linear logarithmic decreases relationship between residual stress and load cycles only after first cycle. We can get :-

- Maximum relaxation (approx 46%) of residual stresses after first cycle.
- Effects of high load is severe in low shot peening intensity.
- Relaxation of residual stresses occurred within first loading cycles were increasing with increasing stress amplitude and due to quasi static relaxation effects.

## *Student's Viewpoint About The Department :*

**"A Saint is one who makes goodness attractive." Surely, a great Teacher does the same thing for Education."**

There are plenty of team projects and practical parts to the Mechanical Engineering course at Dronacharya College of Engineering, not just exams at the end of the year. Activities at the Innovation Club and the Sports facilities are great and help us to maintain balance between theory and practical learning. The department has close and strong contacts with industry to assist the students in getting a good industry exposure and brighten the future prospects.



**Ankit Kaushal** (Roll No. 9975)

**"The main hope of a Nation lies in the proper Education of its youth."**

Since my first year in the Mechanical Engineering course I really enjoyed the practical Sessions. I feel the course has strengthened my overall personality, knowledge and Skills. I also had a chance to work in the Innovation club that helped me get hands-on experience in areas of my interest.



**Pankaj Kumar** (Roll No. 9239)

**"The great end of education is to discipline rather than to furnish the mind; to train it to the use of its own powers rather than to fill it with the accumulation of others."**

During my undergraduate studies at the Mechanical Engineering department, I was able to explore several cutting edge topics through exhaustive studies, laboratory and Workshop. I was also able to actively participate in specialized projects under the able guidance of faculty members. On the other hand, various Paper Presentations, Seminars and clubs have helped me in developing the Technical colloquia.



**Manish Sharma** (Roll No. 9233)

**"Education is for improving the lives of others and for leaving your community and world better than you found it."**

Studying at Dronacharya College of Engineering is the best time of my life. I am enjoying learning at the Mechanical Engineering Department while playing lots of Sports and maintaining a great social life.



**Neeraj Yadav** (Roll No. 9236)