



Dronacharya College of Engineering

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Mechanical Engineering

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From Editor's Desk :

Dronacharya College of Engineering has been maintaining good performance in academics, research & publication and other activities for the last 14 years and is comparable to the best colleges in northern part of the country. The goal of technical education is to produce technocrats & professionals of quality who could combine competence with virtue. We are firmly focused on earning the College a national reputation for excellence and developing it into a choicest destination for Technical education in the country.



We encourage innovative thinking through cognitive approaches of teaching-learning process. Our ultimate aim is to nourish the technocrats with finer aspects of Science, Engineering and Technology that makes them understand, explore and innovate. Driven by an urge to excel and outstand, all departments of our college is on a rapid growth to reach the new heights. It abounds with experienced faculty, laboratories with latest equipments, well-stocked library and other facilities.

At DCE, we impart high-tech education preserving culture, traditions and ethical values of our Nation. We focus on nourishing, developing and flourishing the professional, ethical and moral values in students. Different Technical events, short term courses, motivational lectures, PDP, co-curricular and other activities are also organized to inculcate desirable and positive values among them. As committed educationalists, we become accustomed to the techniques of education not only to face the ever-evolving challenges but also to be progressively creative through scientific research and publication. Offering top quality technical education and molding the younger generation with the spirit of service to society, we aspire to aid the pursuit of knowledge in students.

We try to ensure that every **Dronacharyan** grows to contribute his best towards the economic growth of the nation and place the country among the few top most developed countries of the world. We believe in proper execution of principles relevant to make our college a dream for others.

"Action and not the will alone, makes the wishes come true!"

Editor, (Dr. Sunil K. Mishra)

From HOD's Desk :

**"Kill the Stress before it kills you,
Reach the Goal before it kicks you,
Help others before someone helps you,
Live your life before life leaves you."**

We believe in adding knowledge with quality and quantum in each and every student of DCE. Innovative and patent oriented projects are being undertaken by the students to reach on a path of great heights. The faculty members are also involved in Research & Publication. They along with students have contributed their papers in the bi-annual ***Dronacharya Research Journal (ISSN: 0975-3389)***.



We organized a number of events like ***DronTech, Sports Meet, and NSS Camp*** etc. for overall development of students.

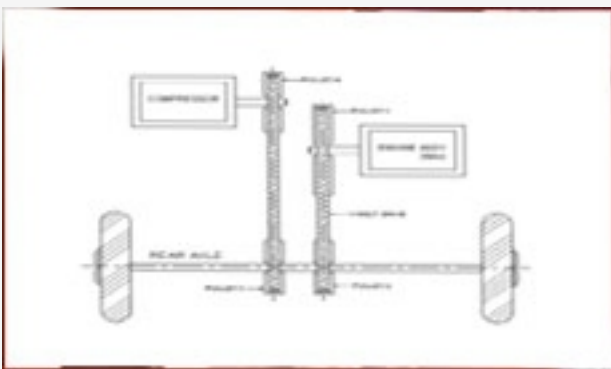
I am sincerely thankful to the magnanimous Management, ***Hon'ble Principal Prof. (Dr.) B. M. K. Prasad*** and ***Dean Academic Prof. (Dr.) Onkar Singh*** for giving their valuable suggestions for growth of the department.

Head of Department ME (Prof. (Dr.) S. K. Bagga)

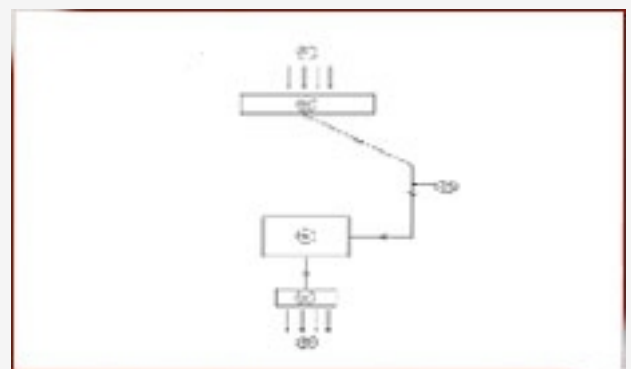
Live Projects Undertaken by Students :

350cc Engine for 4 Wheeler Turbo Wings

In this project a centrifugal compressor which has impeller and diffuser for increasing the air velocity and pressure energy is used. The intake air develops air pressure in front of vehicle and releases it to the rear of the vehicle through duct. The resulting reaction force increases the speed for a given air/fuel ratio and hence the efficiency of the engine. The Project is based on the Centrifugal Compressor System and Hydraulic Piston System which accelerates the speed of the vehicle for the given air/fuel ratio and provide adequate safety.



Mechanism of 350cc Engine for Turbo Wings



Flow Chart

- Source of air i.e. Atmosphere.
- Air suck inlet.
- Duct system, which convey the air from inlet to centrifugal compressor.
- Centrifugal compressor which increases the low air pressure to high pressure by centrifugal action.
- Nozzle which produces a jet of air with high velocity.
- At outlet due to reaction force, airs push the car.

Applications:

- To enhance the speed of the vehicle which provides higher efficiency.
- To provide better safety.
- To also drops down accident during negotiating a turn.

Project Guides

- Prof. S. K. Bagga
- Mrs. Neeta Sharma

Team

- Pawan Kumar Verma (Roll No 10839)
- Suneel Kumar (Roll No 10834)
- Vidyasagar Chauhan (Roll No 10326)
- Sachin Singh Adhikar (Roll No 10310)
- Sahil Narang (Roll No 10311)

Design and Fabrication of a Hybrid Chimney for Power Generation

Solar thermal hybrid chimney is a new method for producing electric power from a solar-wind hybrid system. It combines three technologies—the **chimney effect**, the **green house effect** and the **wind turbine**. Energy from sunlight is converted into heat by a large solar collector. The collector is a transparent membrane suspended several meters off the ground, which can be made of glass or a strong transparent polymer. Sunlight penetrates this membrane, and the solar radiation is converted into heat upon hitting the ground. The air underneath the membrane quickly increases in temperature due to the greenhouse effect and flows towards the chimney, which, through the stack effect, becomes the lowest point of pressure in the system. This continuous airflow spins a turbine located at the base of the chimney. Inside the chimney wind turbines convert the wind's energy into electricity.

A Chimney connects the lower air pressure, near the centre of the collector, to the higher air pressure, a short distance away from the collector. Air moves from high to low air pressure through the air channel. Inside the air channel, pressure-staged wind turbines convert the wind's mechanical energy into electricity.

Applications:

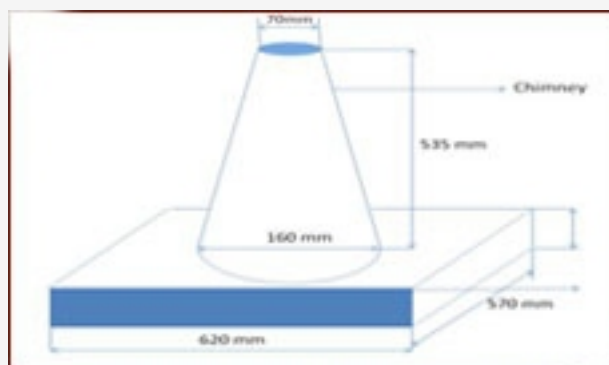
- A small-scale solar updraft tower may be an attractive option for power generation in remote regions of developing countries.
- This is the cheapest method for large scale generation of solar electricity. Although the capital cost is high but the running cost is very low.
- Here, Fuel is free and the power station has a long life.

Project Guides

- Mr. Rajesh Mattoo
- Mr. Rajesh Arora

Team

- Megha Malhotra (Roll No 10289)
- Amit Rohilla (Roll No 10269)
- Rohit Malhotra (Roll No 10307)
- Rohit Saharan (Roll No 10309)

**Design of Chimney**

Design and Development of Sprint Dirt Car

The objective of this project is to design and build a prototype of a rugged single seat, off-road recreational four-wheel vehicles intended for sale to the non-professional, weekend off-road enthusiast. The objectives include that the vehicle must be safe, easily transported, easily maintained and fun to drive. It should be able to negotiate rough terrain in all types of weather without damage.

The sprint Dirt Car as the name suggests is a fast and quick form of dirt speedway in racing world. They are simple and low tech by design. The driver faces a lot of difficulties while driving a car on the dirt tracks, so we are proposing a sprint Dirt Car.

The basic purpose of this car is to run fast on short oval or circular dirt roads as it has a high power to weight ratio and the following mechanical properties also:

➤	Frame (Chassis)	:	Made up of M.S hollow pipe.
➤	Engine	:	153cc Yamaha single cylinder 4-stroke engine.
➤	Fuel System	:	Simple gravitational fuelling system.
➤	Cooling System	:	Air Cooling System
➤	Steering System	:	Ackermann Steering System
➤	Suspension System	:	McPherson Suspension System with coil bar
➤	Braking System	:	Ventilated Disk Brake

Benefits of the Project

- It provides a platform for our college students to participate in such national level projects in the near future.
- It enhances the opportunities for us to get placed as a lot of companies from the automobile sector participate there.
- BAJA SAE India sponsors the winning team at the international level.

Project Guides

- Prof. S. K. Bagga
- Mr. Achin Srivastav

Team

- Ravi Kumar (Roll No 10303)
- Sandeep Kumar (Roll No 10312)
- Vipin (Roll No 10331)
- Sanjeet (Roll No 10313)
- Pankaj (Roll No 10840)
- Sidharth M. (Roll No 10316)
- Sumit Saini (Roll No 10320)



PROTOTYPE : FRAME

Technology Focus :

Lean Manufacturing

Lean Manufacturing is a set of tools and methodologies that aims for the continuous elimination of all wastes in the production process. The following are main benefits of Lean Manufacturing:

- Lower Production Costs
- Increased output
- Shorter production leads

Most of the benefits of lean manufacturing lead to lower unit production costs for example, more effective use of equipments and space leads to lower depreciation costs per unit produced more effective use of labour results in lower labour costs per unit produced and lower defects lead to lower cost of goods sold.

Many of the concepts in Lean Manufacturing originate from the Toyota Production System (TPS) and have been implemented gradually throughout Toyota's operations beginning in the 1950's. By the 1980's Toyota had increasingly become known for the effectiveness with which it had implemented Just-In-Time (JIT) manufacturing systems. Today, Toyota is often considered one of the most efficient manufacturing companies in the world and the company that sets the standard for best practices in Lean Manufacturing.

Lean Manufacturing has increasingly been applied by leading manufacturing companies throughout the world, lead by the major automobile manufactures and their equipment suppliers. Lean Manufacturing is becoming an increasingly important topic for manufacturing companies in developed countries as they try to find ways to compete more effectively against competition from Asia.

Since Lean Manufacturing eliminates many of the problems associated with poor production scheduling and line balancing, it is particularly appropriate for companies that don't have ERP systems in place or don't have strong material requirements planning (MRP), production scheduling or production allocation systems in place.

Student's Viewpoint :

"One has to achieve not merely technical efficiency but greatness of spirit."

I take pride on being a Student of Mechanical Engineering branch which is also imparting not only the education but also preparing us for group discussions, debates, interviews and other competitive examinations.

I am grateful to faculty members of our Department.



Kuldeep (Roll No.10286)

"We must so strive that each man may regard himself as the chief cause of the victory."

During my undergraduate studies in the Mechanical Engineering branch, I was able to explore several cutting-edge topics through exhaustive studies, laboratory and Workshop. I was also able to complete my project '350cc Engine for 4 Wheeler Turbo Wings' under the able guidance of Prof. S. K. Bagga and Mrs. Neeta Sharma. On the other hand participation in paper presentations, Seminars and Innovation club have helped me in shaping my personality and technical acumen.



Vidya S. Chauhan (Roll No.10326)

"The integrity of men is to be measured by their conduct, not by their professions."

It gives me immense pleasure to be associated with the Department of Mechanical Engineering where I credited not only the technical competency but also improved my communication skills, leadership quality and personality.

I am really thankful to my faculty members for grooming and molding me overall.



Pawan Verma (Roll No.10839)

"Life is more meaningful with delight."

I am pleased to articulate my views about the Mechanical Engineering Deptt. of our college where I earned not only the value based engineering knowledge but also improved my character and personality through the synthesis of yoga and personality development workshops.



Surender Singh (Roll No.10322)