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# **ZEAL POLYTECHNIC**

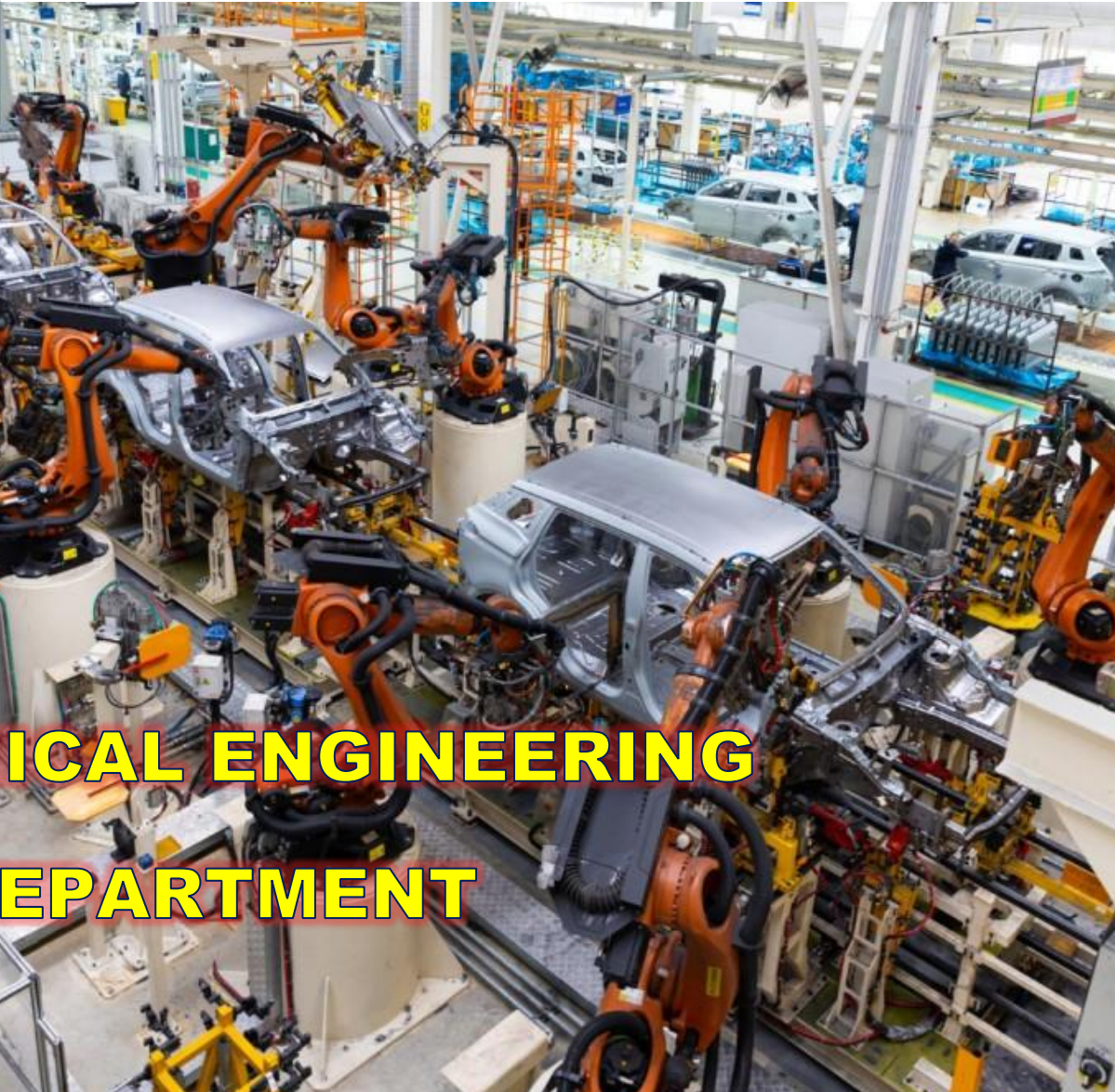
**NARHE, PUNE**

## **NAVNIRMITI**

### **STUDENT PROJECT BOOKLET**

**VOLUME  
NO. 3**

**EDITION -  
MAY-2023**



**MECAHNICAL ENGINEERING  
DEPARTMENT**





## ABOUT INSTITUTE ZEAL POLYTECHNIC, NARHE, PUNE

Zeal Education Society was established in 1996 with the vision to offer education with a difference, the expert guidance of Hon. Shri. S.M. Katkar, a distinguished industrialist. ZES hosts eight institutes that provide quality education to students from pre-primary to Ph.D. courses. Zeal Polytechnic started in 2008 and offers Diploma Courses in Mechanical Engineering, Civil Engineering, Computer Engineering, Electronics and Telecommunication Engineering & Electrical Engineering.

The institute aims at providing the students with excellent Infrastructure, state of the art facilities, well-equipped laboratories and a strong force of faculty members. This has resulted in incredible performance of the students continually throughout the years. Recently, our Founder director has been conferred with the 'Icon of Education' award by Lokmat media group in the presence of Hon. Smt. Smriti Irani, Former HRD Minister, Government of India from Hon. Shri. Vinod Tawde, former Technical Education Minister, Maharashtra State.

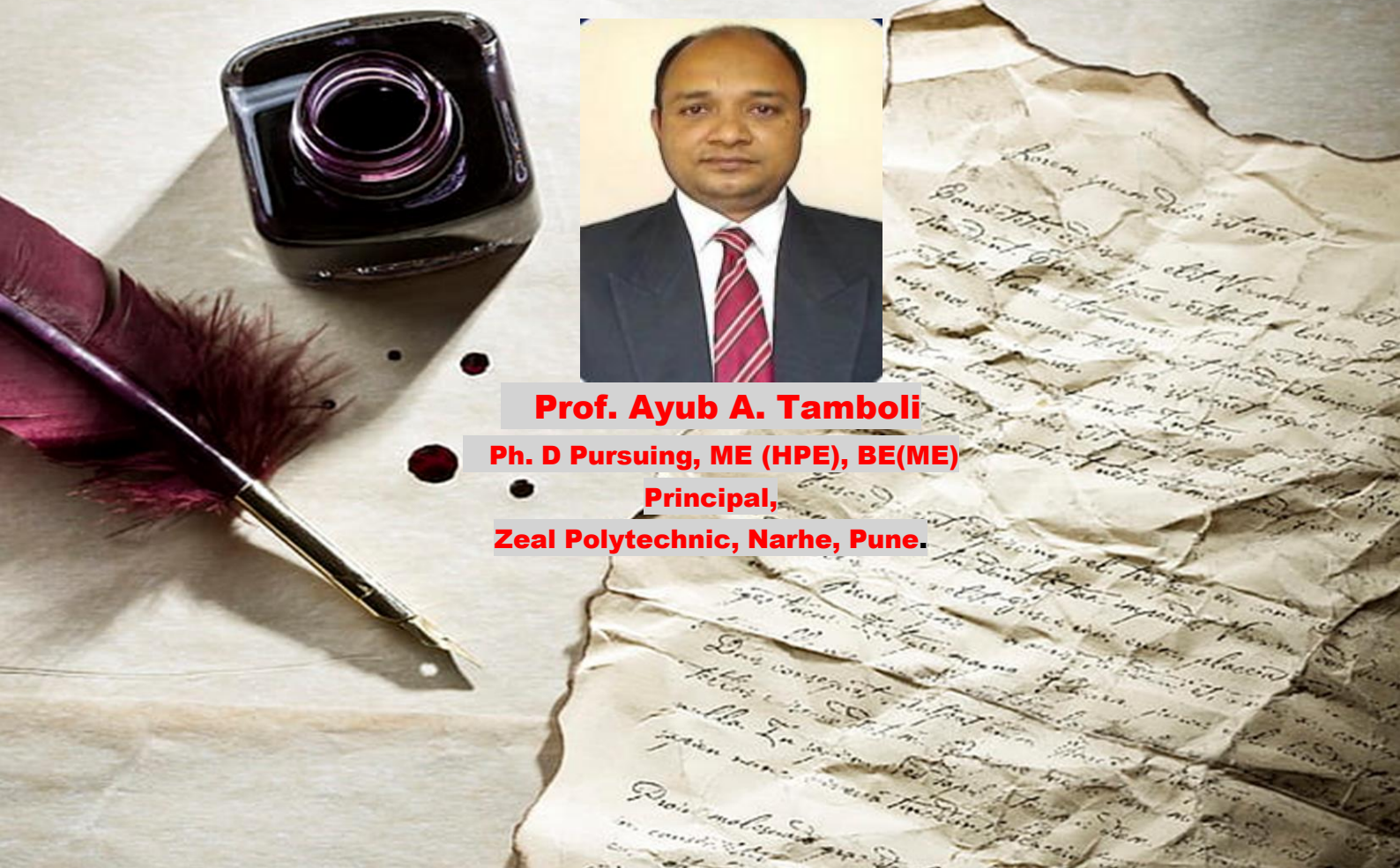
## Principal's Message

***Prof. Ayub A. Tamboli***

I am very happy to note that the department of Mechanical Engineering of Zeal Polytechnic is releasing its NAVNIRMITI, a student project booklet enumerating the various emerging projects of the students. I take immense pride in acknowledging the outstanding academic achievements of our diploma mechanical engineering students. Your commitment to excellence and the pursuit of knowledge has been commendable. Your academic journey is a testament to the dedication and hard work you have invested in your education. Polytechnic education provides the knowledge and skills required to help revolutionize the world in which we live. The students and faculty of department are proactive in taking initiatives in technical, cultural and social events. I hope this NAVNIRMITI a student project booklet will serve the purpose of reflecting all research activities of this department and it will inspire others to do their best. I express my gratitude to each one of you for your contributions to the success of our diploma mechanical engineering program. Together, let us continue to strive for excellence and innovation I congratulate all the students who have put their efforts in bringing this great issue of NAVNIRMITI, a student project booklet and also appreciate HOD and all faculty members for motivating the students towards this fulfillment. I wish each one of them in the department success in all their endeavors.



**Prof. Ayub A. Tamboli**  
**Ph. D Pursuing, ME (HPE), BE(ME)**  
**Principal,**  
**Zeal Polytechnic, Narhe, Pune.**



## **HOD Message**

**Prof. Rameshwar Khorane**

The Department was established as Dnyanganga Polytechnic in 2008. It offers a diploma in mechanical engineering and can accommodate 150 students we function with the vision that the Department should get recognized as an innovative and leading Mechanical department in Pune region and afar. The department aims at offering students with the high-quality education clubbed with practical exposure that empowers them with the ability to aid the society by their services in the future. The Department aims at making superior diploma engineering professionals through academic brilliance and excellent education. The syllabus in Mechanical Engineering is steered with an extraordinary approach that helps students to meet the modern requirements of industries. To cater to the current advancement in technology, new subjects such as CAD / CAM and Automation, alternative Energy Resources, Material Handling System are also conducted using modernized laboratories and the required infrastructure. A team of well qualified and experienced faculty members forms the backbone of the Department. This team is determined to empower students with sound academic knowledge and practical experience which in turn makes the students ready to face the industry challenges.



Prof. Rameshwar Khorane

*HOD,*

*B.E. (Production)*



# NAVNIRMITI COMMITTEE

## CHIEF EDITORIAL

**PRPF. SACHIN SURYWANSHI**  
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**MISS. PRATIKSHA GIRI,**  
**MR. SUMIT HAWALDAR,**  
**MR. YASH JOGLEKAR,**  
**MISS. ASHLESHA MANNDHARE.**

*Dear Readers,*

*In the vibrant tapestry of our academic journey during the 2021-22, the NAVNIRMITY project booklet has been a transformative odyssey. As students passionately engaged in ground breaking research, we found ourselves at the crossroads of curiosity and innovation. This project booklet serves as a testament to our collective pursuit of knowledge and the unyielding dedication that fuelled our academic endeavours. Each student's contribution represents a unique thread in the intricate fabric of NAVNIRMITY, weaving together diverse perspectives and disciplines. Through late-night brainstorming sessions, countless hours in the lab, and the shared excitement of discovery, we forged bonds that extended beyond the realm of academia. The challenges we faced became stepping stones, and the solutions we unearthed stand as markers of our resilience and creativity. This booklet encapsulates not just our academic achievements, but the spirit of collaboration, curiosity, and determination that defines our collective journey through the NAVNIRMITY project. May these pages inspire future students to embrace the joy of exploration and the limitless possibilities that lie within the realm of research.*

*Warm Regards,*

*The Editorial Team*

*Mechanical Engineering Students*



## CAPSTONE PROJECT EXECUTION & REPORT WRITING

### LIST OF PROJECTS FOR A.Y. : 2022-23

S. N.	Group No.	Name of Students	Project Title	Guide Name
1	1	1) Kondhalkar Aditya Anil	Grass Cutting Machine Using Scotch Yoke Mechanism.	Prof.Mohammad Amin
2		2) Gurav Tanmay Sunil		
3		3) Vishwakarma Indresh Ramdhari		
4		4) Aade Arjun Pralhad		
5	2	1) More Prasannhit Tanaji	Design and Development of Parallel & Counter Flow Heat Exchanger	Prof.R.G. Yenkar
6		2) Mulani Mosin Sajid		
7		3) Mundalik Nikhil Dilip		
8		4) Otari Siddharth Sudhir		
9	3	1) Kamble Amol Dnyandev	Waste Heat Recovery from Exhaust of I.C. Engine.	Prof.R.G. Yenkar
10		2) Sable Nilesh Bhagavat		
11		3) Survase Shubham Limbraj		
12		4) Gaikwad Nikhil Subhash		
13	4	1) Tamboli Saad Salim	Silent Air Purifier & Humidifier Using Water.	Prof. M.M. Charate
14		2) Mujawar Aman Gaibisa		
15		3) More Raju Laxman		
16		4) Pawar Shivang Vilas		
17	5	1) Kangude Atharv Sanjay	Automatic Hand Brake Parking for Four Wheeler.	Prof.D.M. Pathak
18		2) Mulani Saif Nabab		
19		3) Mone Deshabhushan Santnath		
20		4) Kamble Mayur Raju		
21	6	1) Jain Bhavesh Santosh	Design & Manufacturing of Peel Tester for Mechanical Engineering Material lab.	Prof. T.A. Garande
22		2) Chorge Yash Sanjay		
23		3) Saste Karan Kailas		
24	7	1) Margale Shivaji Maruti	Optimized Chapati -Ball Maker with Simple Mechanism.	Prof.D.M. Pathak
25		2) Pikle Shivshankar Hulaji		
26		3) Gawalwad Kiran Sanjay		
27		4) Lohar Omkar Dnyaneshwar		
28	8	1) Padwal Vivek Rajendra	Shell & Tube Heat Exchanger.	Prof.S.S. Chougule
29		2) Hawaldar Sumit Satish		
30		3) Ghanekar Pranav Sanjay		
31		4) Kamble Harshwardhan. S		
32	9	5) Shete.Saish Amit		Prof. A.M. Chandane
33		6) Doke Ayush Prakash		
34		7) Atre Yash Rahul		
35		8) Thorat Rahul Sandeep		

36	10	1) Bisure Janvi Datta	Vehicle Accident Alert System Using GPS,GSM & Accelerometer.	Prof.P. R. Mahale
37		2) Sutar Amar Shantaram		
38		3) Sonawane Aadesh Bhagwan		
39		4) Chavan Sachin Shantaram		
40	11	1) More Shwetali Vijay	Waste Segregation system using Arduino.	Prof. S. S. Suryawans
41		2) Rathod Anjali Shivaji		
42		3) Khillare Kuldeep Laxman		
43	12	1) Raut Sarvesh Anant	Electricity Generation by Speed Breaker.	Prof. B. R. Jadhav
44		2) Shinde Piyush Rajendra		
45		3) Bhosale Pruthviraj Anil		
46		4) Tambade Vaibhav Shashikant		
47	13	1) Bagde Kunal Rajendra	Design & Fabrication of FDM Based Portable 3D Printer.	Prof. S. G. Aghor
48		2) Dhumal Suraj Anil		
49		3) Shaikh Gulam SubhanMushtaque		
50	14	1) Totaganti Aditya G.	Frictionless Braking System.	Prof. B. P. Shinde
51		2) Mali Pranav P.		
52		3) Pakhare Yuvraj U.		
53		4) Yeware Rushikesh S.		
54	15	1) Khandagale Vaibhav M.	Design & Development of Automated Hammering Machine.	Prof. N. N. Kokare
55		2) Jagnore Swapnil S.		
56		3) Jadhav Atharv R.		
57		4) Kilari Om S.		
58	16	1) Pawar Omkar G.	Steam Engine.	Prof. B. R. Jadhav
59		2) Sardar Prajwal V.		
60		3) Pardeshi Ayush V.		
61		4) Chorge Onkar R.		
62	17	1) Waghmode Rohan A.	Design and Development of Agricultural Rover.	Prof. S. R. Shaikh
63		2) Waghmare Sagar A.		
64		3) Gonde Kshitij V.		
65		4) Chavan Kshitij S.		
66	18	1) Bagade Omkar	Reciprocating Motion Using Inclined Disc Mechanism.	Prof. R. S. Nagmode
67		2) Deshpande Kaustubh		
68		3) Palem Nishant		
69	19	1) Sagade Ajay V.	Automatic Baby Cradle.	Prof. R. S. Nagmode
70		2) Waghmare Kashinath S.		
71		3) Rawade Sahil S.		
72	20	1) Sabale Swapnil	Automatic Sand Filter & Separator.	Prof. A. S. Mohammed
73		2) Giri Pratiksha		
74		3) Bhagwat Yashraj		
75	21	1) Khan Shoaib Babar	Pneumatic Operated Vice.	Prof. N. N. Kokare
76		2) Badade Siddharth Santosh		
77		3) Kamate Hrishikesh Santosh		
78		4) More Sanket Dada		

79	22	1) Pujari Amit Ningappa	Design & Fabrication of Industrial Conveyor Using Four Bar Mechanism.	Prof. S. R. Shaikh
80		2) Papul Prem Hanumant		
81		3) Dhamdhare Atharv Ravindra		
82		4) Kulkarni Abhay Sudhakar		
83	23	1) Poman Prajwal Kiran	Design & Manufacturing of Hood of LED Lamp.	Prof. S. G. Aghor
84		2) Gajghate Suyash Arjun		
85		3) Hiremath Abhishek Shivkumar		
86		4) Pisal Yash Kantaram		
87	24	1) Phule Yash Ravindra	Design & Manufacture of Side Plate of Led Lamp	Prof. P. R. Mahale
88		2) Dighe Shivam Popat		
89		3) Phutane Vishwesh Yogendra		
90		4) Jadhav Srujan Kumar Satuppa		





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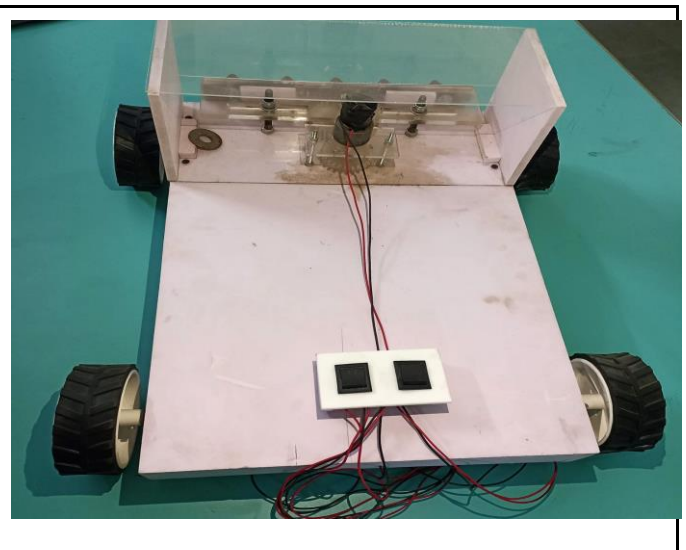
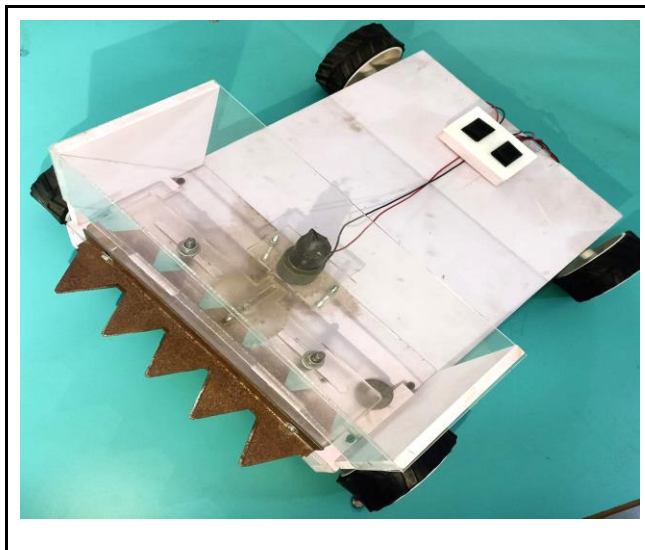
**PROJECT TITLE: - GRASS CUTTING MACHINE USING SCOTCH YOKE MECHANISM.**

**Abstract:-**

In the present generation, pollution is a very serious problem in the world. Pollution is man-made, which we can see in our daily life. Pollution impacts the health of humans as well as wildlife and biodiversity. The traditional IC engine grass cutter used to cut grasses but nowadays everyone is shifting towards some modern and less polluting machines, hence because of its environmental impact and increased fuel rates. IC engine driven cutters require more maintenance. The IC Engine driven grass cutter consumes more energy and produces less work thus the efficiency of these Cutters is less. Also, the less safety feature included in such types of cutters. To avoid such problems, we plan to build a new type of grass cutter which runs on solar energy and also on electrical energy by battery. This model is economical compared to Traditional grass cutters. The aim of our project is to make a grass cutter which operates on solar energy, hence saving electricity and reducing manpower. Also, The efficiency of this cutter is more than these IC engine cutters.

Our tasks are more comfortable and sophisticated thanks to the rapid rise of numerous high-tech instruments and equipment. The goal of the project is to create a lawn cutting machine system that uses solar energy to power the grass cutter.

**Project Photo :-**





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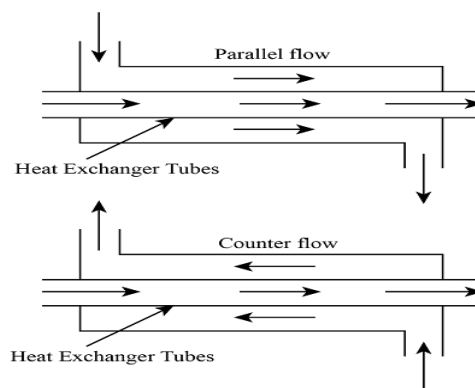
- Name of Students :-**
- 1) Kondhalkar Aditya Anil
  - 2) Gurav Tanmay Sunil
  - 3) Vishwakarma Indresh Ramdhari
  - 4) Aade Arjun Pralhad
- Guide Name: -** Prof.Mohammad Amin

**PROJECT TITLE: - DESIGN AND DEVELOPMENT OF PARALLEL & COUNTER FLOW HEAT EXCHANGER.**

**Abstract:-**

A Heat Exchanger is a device which is used to transfer heat from one fluid to another, whether the fluids are separated by a solid wall so that they never mix, or the fluids are directly in contact. Every year Heat exchanger technology is growing to develop efficient, compact and economical heat exchangers, all over the world. Updating the community for this development needs an interaction. These days' concentric tube heat exchangers are used with forced convection for lowering the working fluid's temperature by raising the cooling medium's temperature.

The purpose of this project is to use Design and devolve Heat exchanger and practical calculations of temperature drops as a function of both flow and inlet temperature and how each varies with the other. Heat exchanger model was designed and simulated for both parallel flow and counter flow heat exchanger.





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**Project Photo :-**



**Name of Students :-**

- 1) More Prasannhit Tanaji
- 2) Mulani Mosin Sajid
- 3) Mundalik Nikhil Dilip
- 4) Otari Siddharth Sudhir

**Guide Name :-** Prof.R.G. Yenkar





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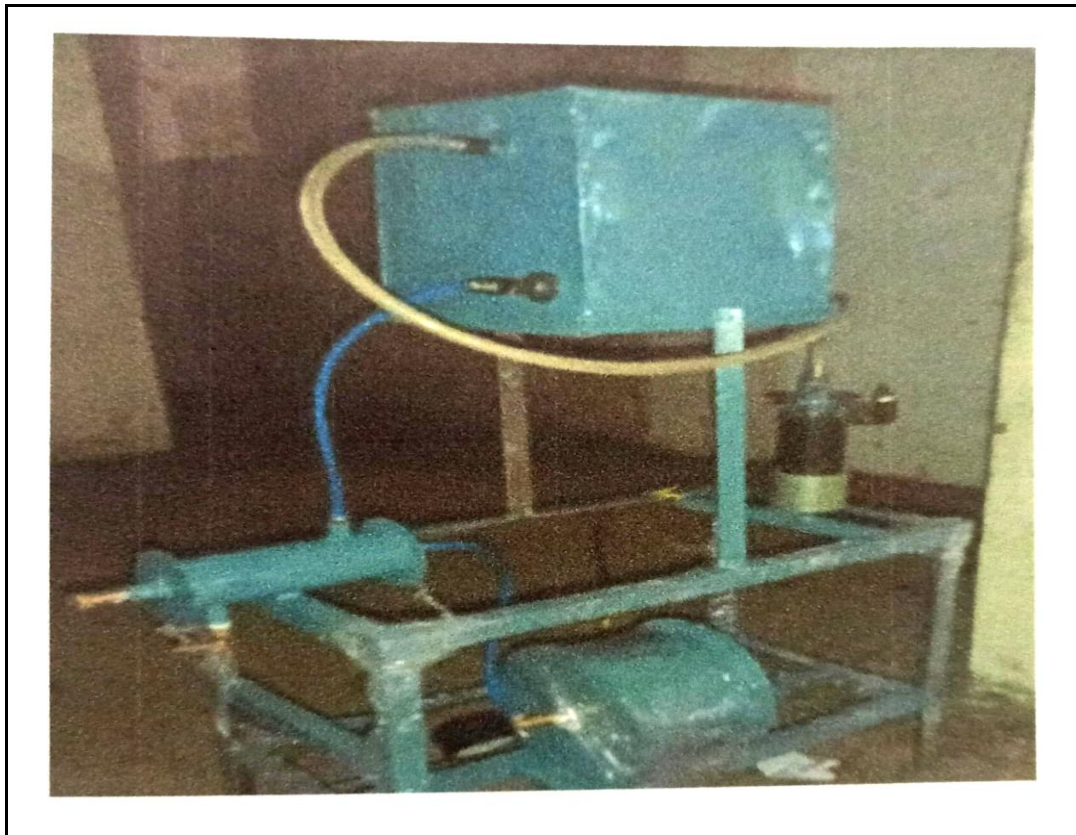
**PROJECT TITLE: - WASTE HEAT RECOVERY FROM EXHAUST OF I.C. ENGINE.**

**Abstract:-**

This paper presents the investigation of a single-effect ammonia-water absorption system Driven by heat rejected from a diesel engine. The waste heat is recovered using an exhaust heat exchanger and delivered to the disrober by a heat transfer fluid loop.

A steam machine needs pressurized gas to work. This can be compressed air but it used to be steam. Energy was provided to the steam engine by heating up water. I don't understand why it used water as the pressurized gas could have been generated only by heating air in a closed tank.

**Project Photo:-**







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- Name of Students :-**
- 1) Kamble Amol Dnyandev
  - 2) Sable Nilesh Bhagavat
  - 3) Survase Shubham Limbraj
  - 4) Gaikwad Nikhil Subhash

**Guide Name :-** Prof.R.G. Yenkar

**PROJECT TITLE: - SILENT AIR PURIFIER & HUMIDIFIER USING WATER.**

**Abstract:-**

Air pollution has crossed all bounds in 2021. WHO estimates that around 7 million people die every year from exposure to polluted air. The spread of air pollution is so high that about 91% of the world population is exposed to air pollution.

Well this also means that the air you breathe in your house is polluted, To counter this issue We here develop a mini air purifier that does not use expensive filters but rather uses water as an air filter. Also it acts as an air humidifier and can be used as an oil diffuser too which helps you relax and also kill certain bacteria and viruses present in the air.

The mini Air Purifier brings up the following key aspects

- A Low Cost Purifier
- No Expensive Filters Just Water
- Quiet Operation
- Easy Maintenance
- Also acts as a Humidifier
- Low Power Consumption
- Easy To Use
- Can be used as an oil Diffuser

The system makes use of 2 x high power low noise centrifugal fans that are used to suck in air through a protection mesh. The pulled air is then passed through a water tank situated at the bottom of



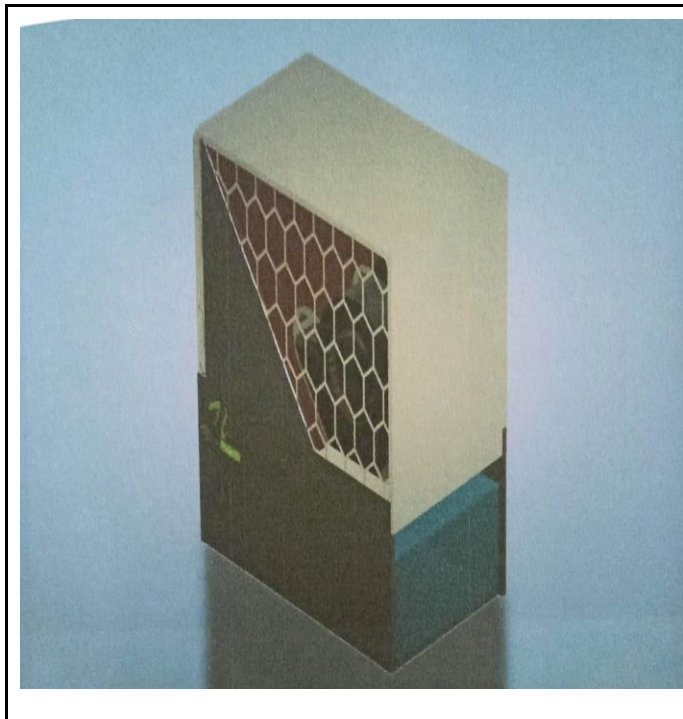
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**Department of Mechanical Engineering**



the purifier. The air passed through water gets auto purified as water traps dust, fungi, bacteria etc in the water. The resulting air rising through the water is a high humidity cool air.

Also added essential oils to the system allow for humidifying the area/room with essential oils which are researched to kill certain types of bacteria fungi in air and help humans relax. Also some essential oils are researched to provide various health benefits when inhaled.

**Project Photo :-**



- Name of Students :-**
- 1) Tamboli Saad Salim
  - 2) Mujawar Aman Gaibisa
  - 3) More Raju Laxman
  - 4) Pawar Shivang Vilas

**Guide Name :-** Prof. M.M. Charate



**PROJECT TITLE: - AUTOMATIC HAND BRAKE PARKING FOR FOUR WHEELER.**

**Abstract :-**

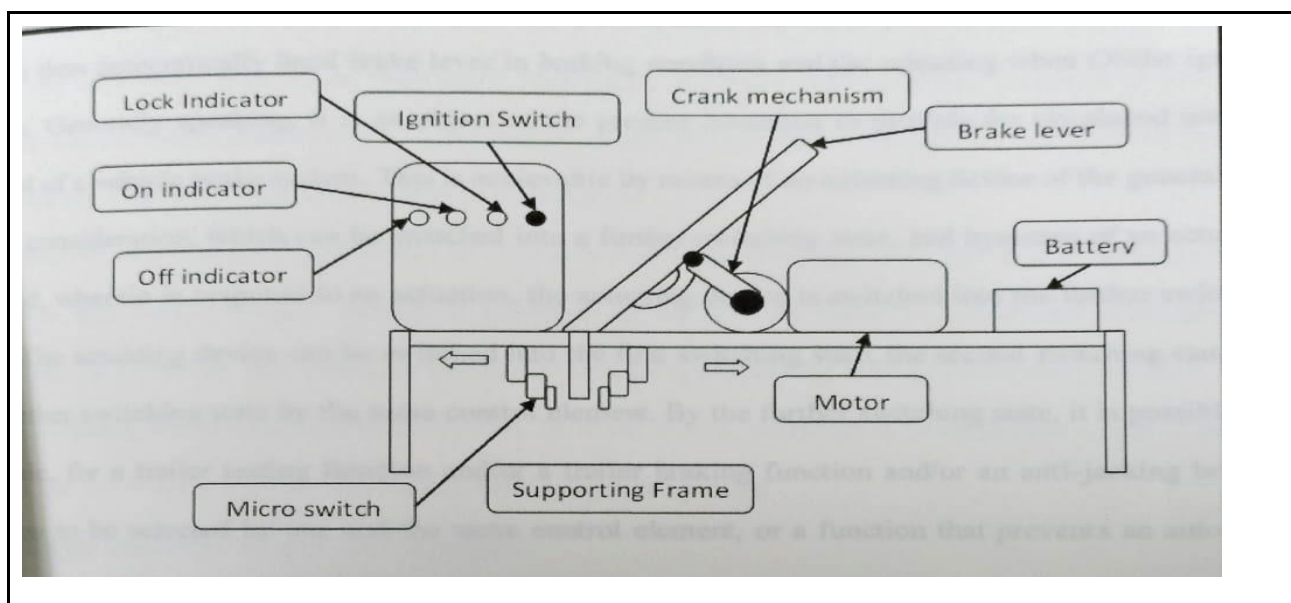
In this world of mechatronics and automation, various systems have been developed just to reduce the time and human error. The automated braking system is a part of mechatronics. Presently the vehicle has an alarm system for maintaining the safe distance between moving vehicles.

When the vehicle gets too close to the object, the alarm is triggered that warns the driver about an object. But this feature has many problems and is prone to human error. We have brought the facility by using the same sensor system but with the automated braking system which restricts the backward motion of the vehicle.

Our aim is to design a system which can avoid accidents in reversing the heavy loaded vehicles. Like trucks, buses and all the vehicles consist of a pneumatic braking system. For this purpose we have developed a model which uses automatic braking for four wheeler when locking the ignition switch and releasing when on the ignition switch.

Now the project mainly concentrates on designing a suitable operating system. To maintain Simplicity and economy in the design of the locally fabricated unit has been used.

**Project Photo:-**





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- Name of Students :-**
- 1) Kangude Atharv Sanjay
  - 2) Mulani Saif Nabab
  - 3) Mone Deshabhushan Santnath
  - 4) Kamble Mayur Raju

**Guide Name :-** Prof.D.M. Pathak

**PROJECT TITLE: - DESIGN & MANUFACTURING OF PEEL TESTER FOR MECHANICAL ENGINEERING MATERIAL LAB.**

**Abstract:-**

A peel test is a basic form of mechanical testing that measures the properties of an adhesive bond. Peel tests involve applying a tensile force to a flexible substrate that is bound by an adhesive to either another flexible substrate (such as tape, thin film, or rubber) or a rigid substrate (such as metal, rigid plastic, or composite). Common results from a peel test are initial peak force, average force over the seal, and peel strength (average force per width of the specimen).

Peel testing is critical for evaluating the seal strength of various adhesive bonds. Some bonds, such as those that seal consumer packaging, are intended to be broken at low forces, while others, such as those used in automotive applications, must withstand extreme conditions. When manufacturing adhesives and substrates, it is critical to have a thorough understanding of how your bonds will function in their end-use applications. Environmental conditions and specimen conditioning also play a significant factor, as temperature conditions over time can affect the strength of adhesive bonds.

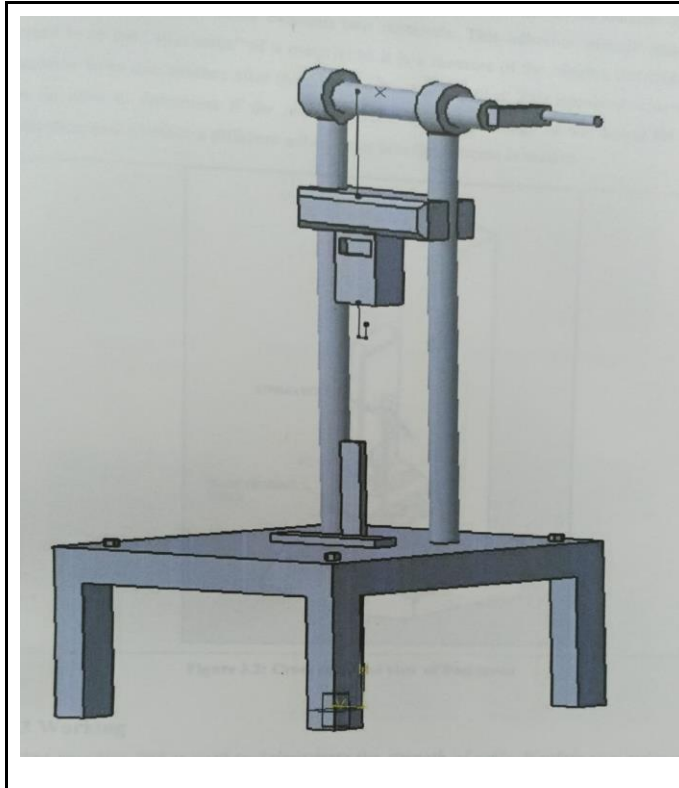
- Name of Students :-**
- 1) Jain Bhavesh Santosh
  - 2) Chorge Yash Sanjay
  - 3) Saste Karan Kailas

**Guide Name :-** Prof. T.A. Garande





**Project Photo :-**



**PROJECT TITLE: - OPTIMIZED CHAPATI -BALL MAKER WITH SIMPLE MECHANISM.**

**Abstract :-**

In today's world, the growth of food industries is very fast where machines with higher productivity rate and good quality food products are demanded. Nowadays so many machines are available in the market, which are satisfying the demand of the food industry. Along with the big food manufacturing industries, there are so many small industries and household food businesses where such types of machines with higher cost are not affordable due to their higher costs.

In our project, we are simplifying the work of making balls of dough by a machine instead of making it manually. Dough Ball Making Machine, which is used to make the dough balls. Here In this machine it does not require any compressor to operate. It is a simple and smooth machine to operate. Just feed the dough and you get dough balls of required size. Dough Kneader, or commonly known as

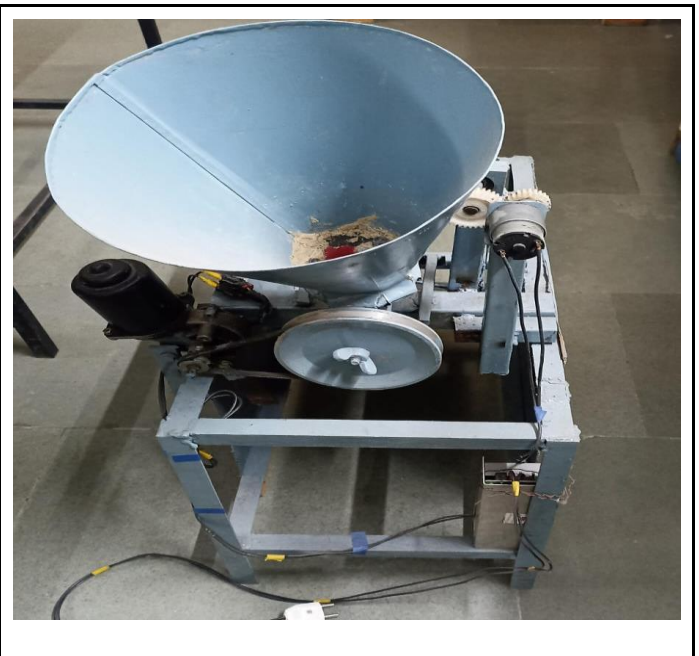


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Atta Kneader is used to make the homogeneous dough for Chapattis. This machine can be used for small food manufacturing businesses as well as it can be used by the housewives for daily use for making the dough balls easily.

**Project Photo:-**





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- Name of Students :-**
- 1) Margale Shivaji Maruti
  - 2) Pikle Shivshankar Hulaji
  - 3) Gawalwad Kiran Sanjay
  - 4) Lohar Omkar Dnyaneshwar

**Guide Name :-** Prof.D.M. Pathak

**PROJECT TITLE: - SHELL & TUBE HEAT EXCHANGER.**

**Abstract:-**

In present day shell and tube heat exchanger is the most common type heat exchanger widely used in oil refinery and other large chemical processes, because it suits high pressure application. The process in solving simulation consists of modeling and meshing the basic geometry of shell and tube heat exchanger using CFD package ANSYS 13.0.

The objective of the project is design of shell and tube heat exchanger with helical baffle and study the flow and temperature field inside the shell using ANSYS software tools. The heat exchanger contains 2 tubes and 600 mm length shell diameter 10 mm, The helix angle of helical baffle will be varied from 0 to 20°, In simulation will show how the pressure varies in shell due to different helix angle and flow rate.

The flow pattern in the shell side of the heat exchanger with continuous helical baffles was forced to be rotational and helical due to the geometry of the continuous helical baffles, which results in a significant increase in heat transfer coefficient per unit pressure drop in the heat exchanger.

**Project Photo :-**







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- Name of Students :-**
- 1) Padwal Vivek Rajendra
  - 2) Hawaldar Sumit Satish
  - 3) Ghanekar Pranav Sanjay
  - 4) Kamble Harshwardhan. S.
  - 5) Shete.Saish Amit
  - 6) Doke Ayush Prakash
  - 7) Atre Yash Rahul
  - 8) Thorat Rahul Sandeep

- Guide Name :-**
- 1) Prof.S.S. Chougule
  - 2) Prof. A.M. Chandane

**PROJECT TITLE: - VEHICLE ACCIDENT ALERT SYSTEM USING GPS,GSM & ACCELEROMETER.**

**Abstract:-**

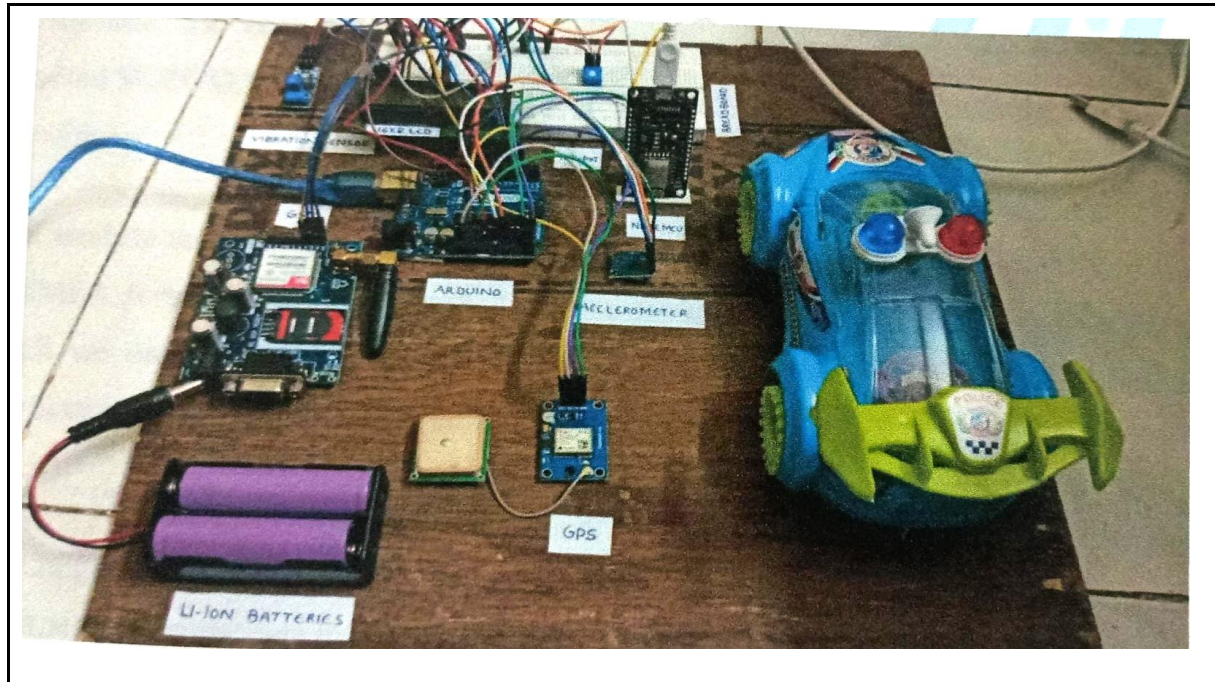
One of the basic reasons for road accidents is speed. If emergency services could get accident reports and reach it in time, more lives could have been saved. In saving human lives, the time between the accidentant and when the ambulance reaches the site of the accident plays an important role.

If we reduce the time between when an accident happens and when a medical ambulance is dispatched to the area, we can save human lives by our project that is "VEHICLE ACCIDENT ALERT SYSTEM USING GPS, GSM, ACCELEROMETER"

GPS has become an integral part of a vehicle system nowadays. The accelerometer senses a sudden shift in the vehicle's axles. It will be tested by Arduino. The Arduino sends the warning message via the GSM module to the police control room or a rescue team, including the location. So, after receiving the information, the police can automatically track the location via the GPS module. Then, the appropriate action will be taken after verifying the venue.



**Project Photo :-**



- Name of Students :-**
- 1) Bisure Janvi Datta
  - 2) Sutar Amar Shantaram
  - 3) Sonawane Aadesh Bhagwan
  - 4) Chavan Sachin Shantaram

**Guide Name :-** Prof.P. R. Mahale

**PROJECT TITLE: - WASTE SEGREGATION SYSTEM USING ARDUINO.**

**Abstract :-**

In today's world of fast progress, more and more garbage is generated, whether directly or indirectly. A daily trash generation in tones needs an efficient management strategy. If this is not done properly, nearly endless open spaces will be necessary to deposit the waste.

IOT (Internet of things) enabled smart waste segregation and management devices that identifies garbage in bins using sensor devices and segregates waste substances in the bins with the



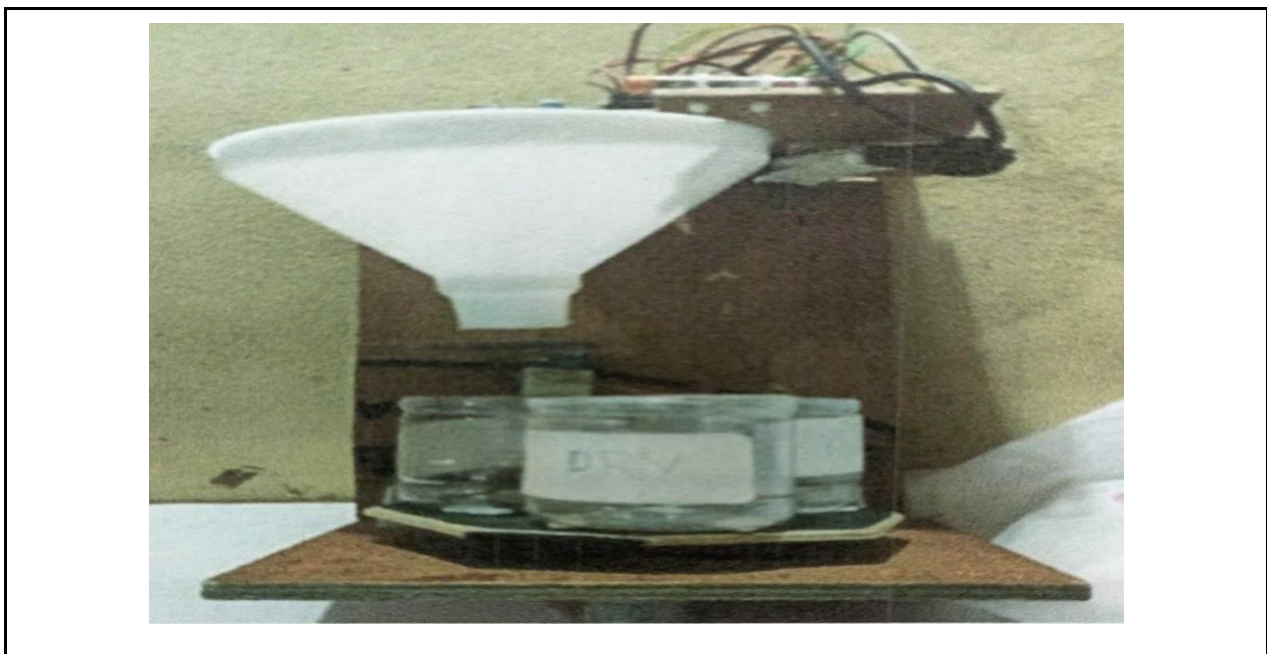
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help of sensors as soon as they are discovered. The microcontroller serves as a link between the sensors and the IOT module.

To determine the proximity of the waste material, an infrared sensor is used. The moisture sensor analyses and reports the moisture content of the trash, and if moisture content is available, the waste can be disposed of in the WET dustbin. Metal sensors are used to separate metal things, which are then divided into sections. With the use of numerous sensors, the suggested system seeks to divide wastes into the aforementioned categories and automate the process of segregation.

**Project Photo :-**



**Name of Students :-**

- 1) More Shwetalvi Vijay
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**PROJECT TITLE: - ELECTRICITY GENERATION BY SPEED BREAKER.**

**Abstract :-**

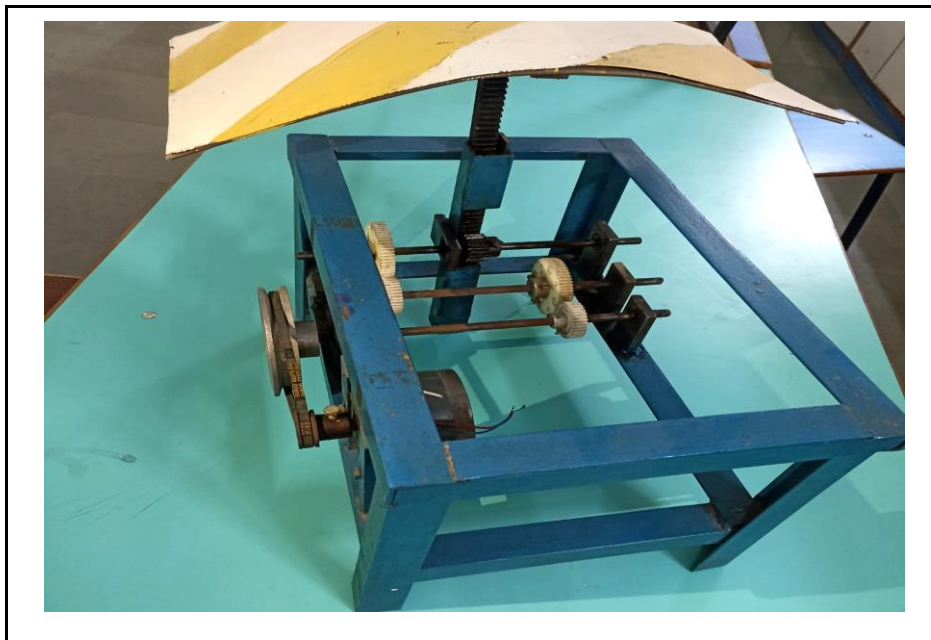
The Speed Breaker is specially planned to design and fabricate the conversion unit for utilizing the available non-conventional energy source. That is tremendously available energy in low intensity with ample quantity can be utilized.

This machine converts reciprocating motion into rotary motion. The rotational power is stored in a flywheel & flywheel rotate alternator that generates electricity. The vehicles which are crossing the speed breaker are applying the impact force or thrust on the projected speed breaker.

This impact pressure energy can be utilized to operate the rack and pinion gearing and through the train of pulleys can operate the flywheel, which stores the energy and utilizes it for continuous rotation of the generator operating pulley and belt transmission system.

This source of power can be used at the highway road side by schools, colleges or Hotels and most likely by the High-way rescue Hospitals. Also by accumulating this low intensity electricity in Batteries, it can be supplied to the Big villages or in towns where there is scarcity of electric supply.

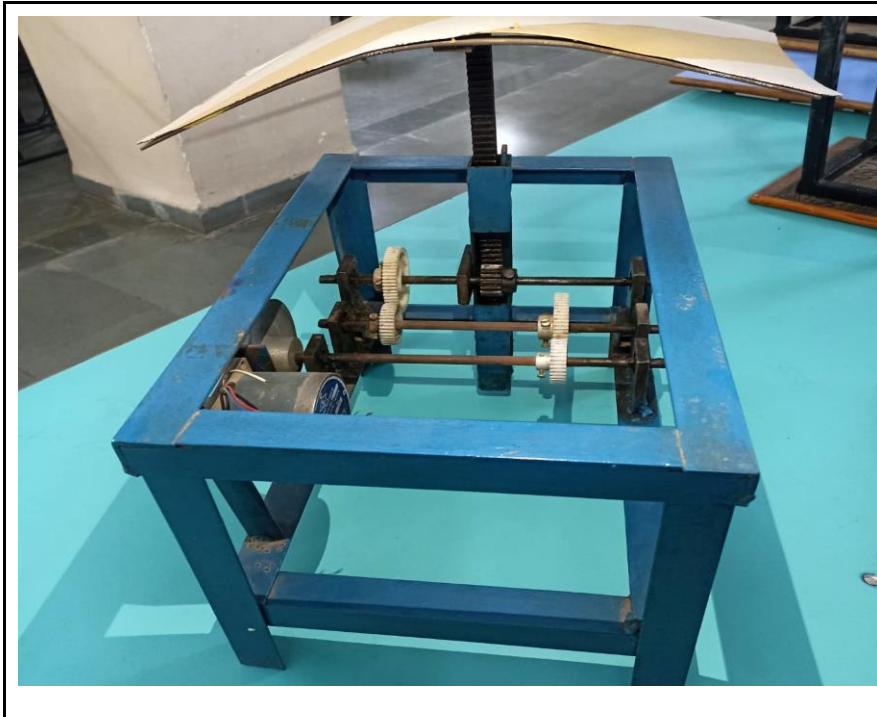
**Project Photo :-**







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- Name of Students :-**
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  - 3) Bhosale Pruthviraj Anil
  - 4) Tambade Vaibhav Shashikant
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**PROJECT TITLE: - DESIGN & FABRICATION OF FDM BASED PORTABLE 3D PRINTER.**

**Abstract :-**

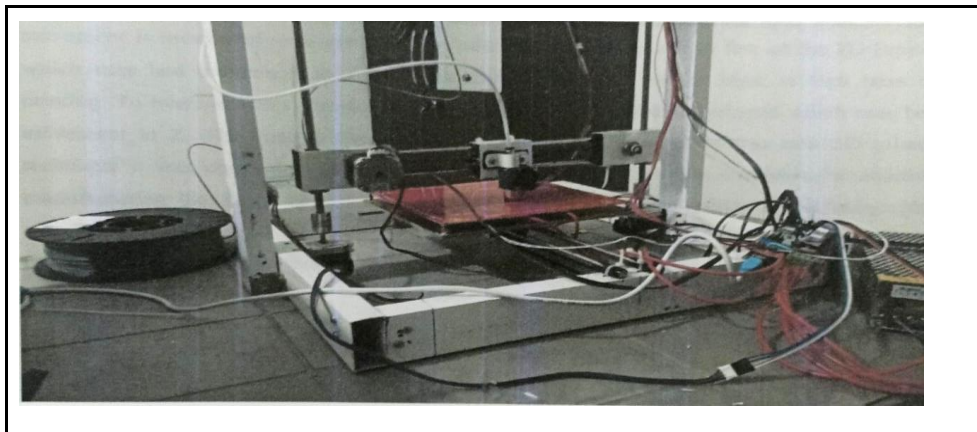
3D printing is a form of additive manufacturing technology where a three dimensional object is created by laying down successive layers of material. It is also known as rapid prototyping. It is a mechanized method whereby 3D objects are quickly made on a reasonably sized machine connected to a computer containing blueprints for the object.

The 3D printing concept of custom manufacturing is exciting to nearly everyone. This revolutionary method for creating 3D models with the use of inkjet technology saves time and cost by eliminating the need to design; print and glue together separate model parts. Now, you can create a complete model in a single process using 3D printing.

The basic principles include materials cartridges, flexibility of output, and translation of code into a visible pattern. Additive manufacturing process or 3D printing process is now becoming more popular because of its advantages over conventional processes. A 3D printer is a machine that creates objects out of plastic, nylon like many other materials. 3D printers nowadays are not so portable and also they are very costly. By analyzing this problem, we are trying to make a portable 3D printer.

The cost of this printer will be very less compared to other 3D printers. Making a low cost 3D printer with a price 15% lower than the market.

**Project Photo :-**





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- 1) Bagde Kunal Rajendra
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- 3) Shaikh Gulam SubhanMushtaque

**Guide Name :-** Prof. S. G. Aghor

**PROJECT TITLE: - FRICTIONLESS BRAKING SYSTEM.**

**Abstract:-**

Most braking systems run on the principle of kinetic energy to the heat energy. This is the method which has its own disadvantages and must be replaced with a more efficient braking system that responds quickly, doesn't heat and is also maintenance free.

In this project, a frictionless braking system is proposed using eddy current phenomenon. This phenomenon is administered by Faraday's law of electromagnetic induction and lenz' law. Eddy current is generated by the relative motion between a metal, alloy conductor and a magnet. The current induced magnetic fields in the conductor which opposes the actual magnetic field of the magnet and results in the deceleration of motion (lenz law).

The constant magnetic field is the easiest design to implement. The mechanism which implements this phenomenon in the evolving braking system. This braking system is frictionless, hence it's advantageous over conventional friction brakes in terms of performance and maintenance. The proposed system is implemented in the rear wheel of vehicles.

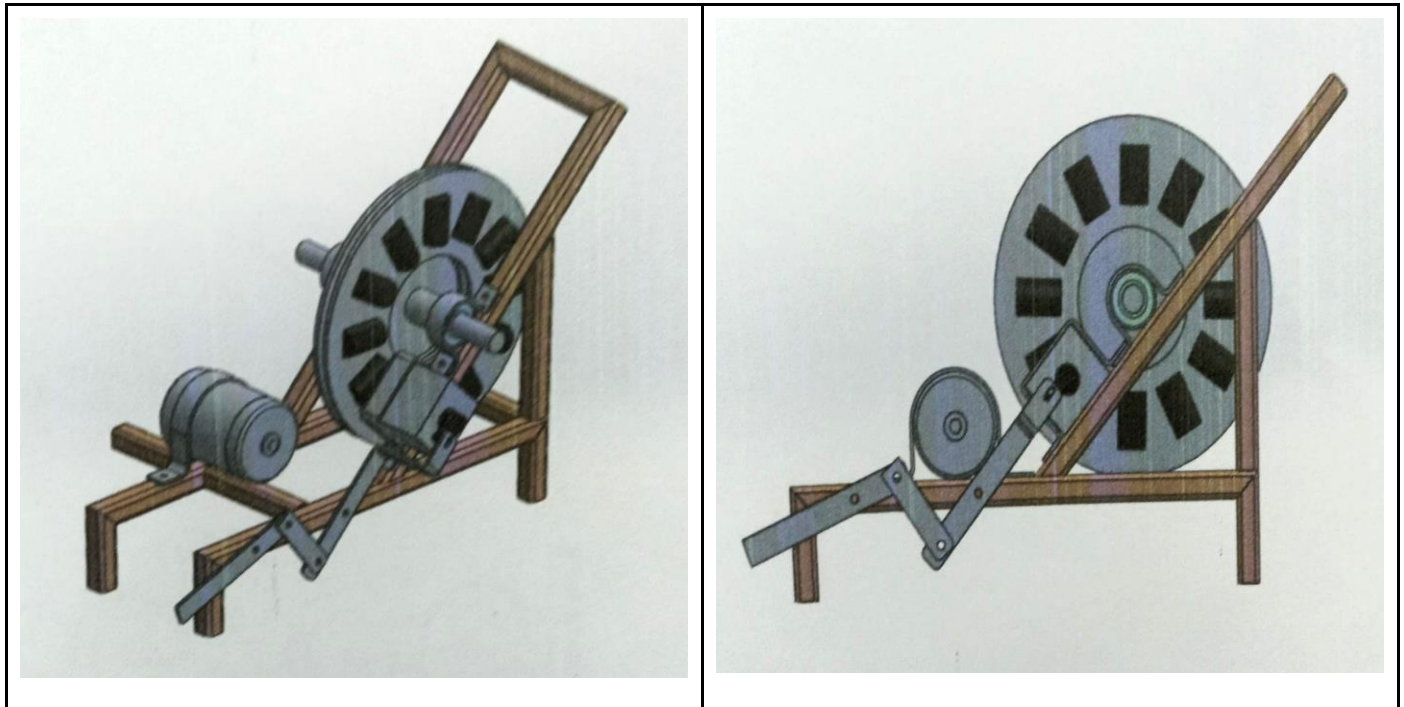
**Name of Students :-**

- 1) Totaganti Aditya G.
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- 4) Yeware Rushikesh S.

**Guide Name :-** Prof. B. P. Shinde



**Project Photo :-**



**PROJECT TITLE: - DESIGN & DEVELOPMENT OF AUTOMATED HAMMERING MACHINE.**

**Abstract:-**

This project aims at designing and fabricating an automated hammering machine that can perform hammering operations without the involvement of any human operator. This project is selected because no Such machines are available in these industries. The introduction of an automated hammering machine in the industries will help the industries in prospering and it will make the operations safe and easy.

Moreover, the project will have a greater impact on the metal industries. The machine will be capable of performing fast and accurate hammering operations with the help of a 0.5 HP Motor. Mild steel is used for fabricating the machine. A large pulley and a shaft are connected with the help of a connecting rod.





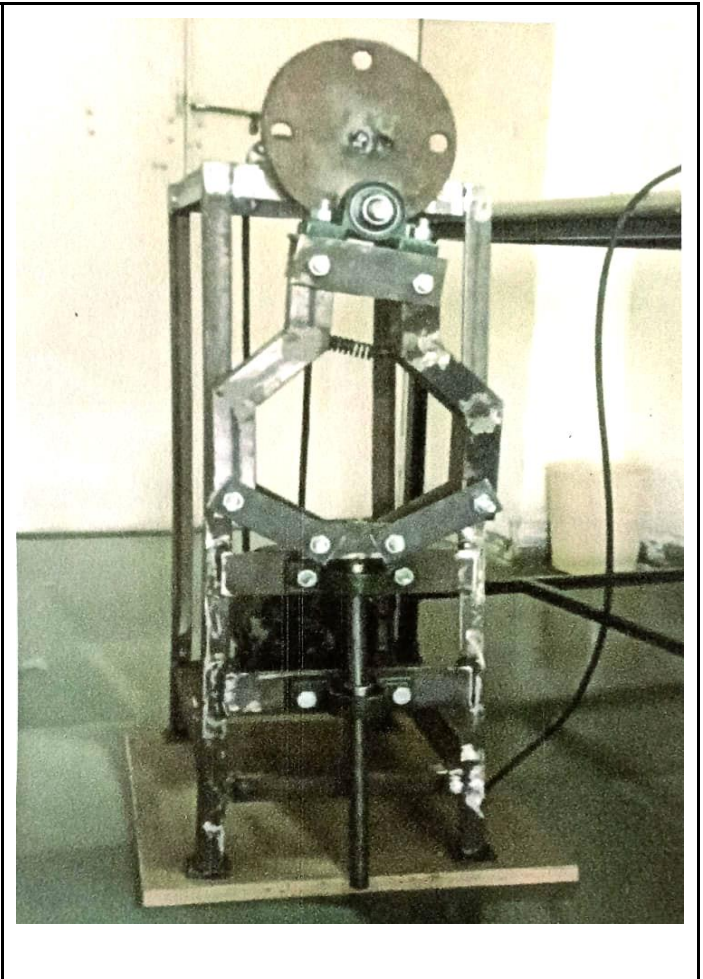
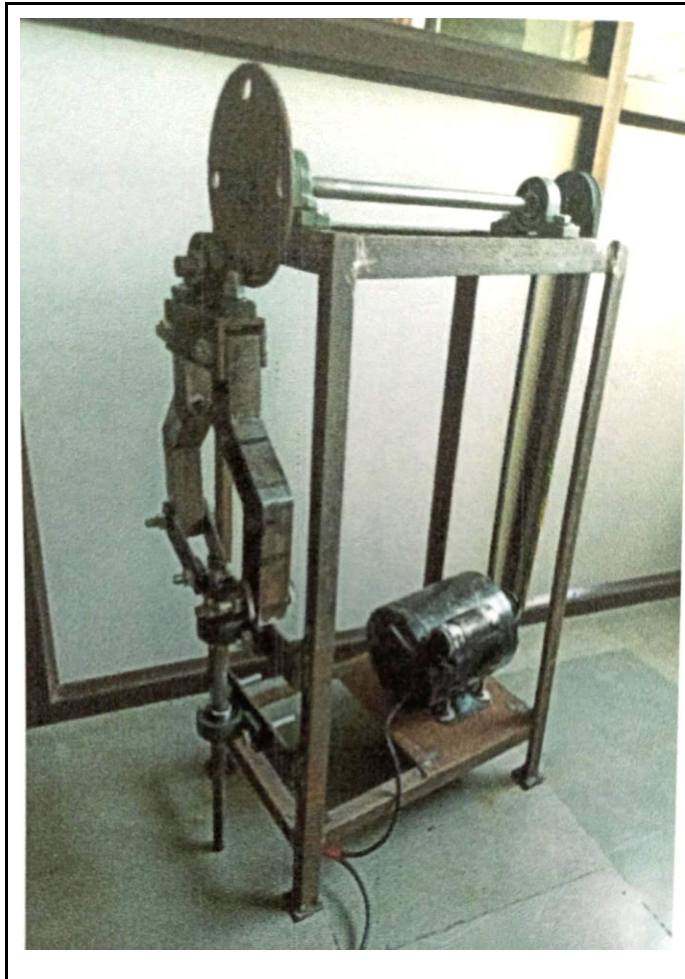
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The spinning shaft will provide lateral motion to the rod. A mid-swinging arrangement is used for attaching the hammer and the connecting rod. A suitable bed will be developed for holding the workpiece.

The main objective of the project is to develop an automated hammering machine with the help of a pulley, V Belt, shaft, connecting rod, hammer, Bering and 0.5 HP motor to provide ease for the hammering operations. Future work may involve the development of a body case for the machine.

**Project Photo :-**







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**Name of Students :-**

- 1) Khandagale Vaibhav M.
- 2) Jagnore Swapnil S.
- 3) Jadhav Atharv R.
- 4) Kilari Om S.

**Guide Name :-** Prof. N. N. Kokare

**PROJECT TITLE: - STEAM ENGINE.**

**Abstract :-**

A steam engine is a heat engine that performs mechanical work using steam as its working fluid. Heat is obtained from fuel burnt in a closed firebox. The heat is transferred to the water in a pressurized boiler, ultimately boiling the water and transforming it into saturated steam.

Steam in its saturated state is always produced at the temperature of the boiling water, which in turn depends on the steam pressure on the water surface within the boiler. The steam is transferred to the motor unit which uses it to push on pistons to power machinery. The used cooler, lower pressure steam is exhausted to the atmosphere. The project simulates the working of a steam engine. It illustrates how the linear motion of the piston is converted into rotary motion.

The engine is initially at rest. On right clicking, the user is provided with a menu which provides five options-shaded, animate, increase speed, decrease speed, transparent. The animate option starts the steam engine from rest or stops the engine if it is running. The speed of the engine can then be increased by the increase speed option or decreased by the decrease speed option.

The texture of the engine can be changed by the shaded option. There are two textures. One being the normal solid fill and the other being wireframe. The transparent option makes the front portion of the cylinder transparent and shows the up and down motion of the piston.



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**Project Photo :-**



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- 3) Pardeshi Ayush V.
- 4) Chorge Onkar R.

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**PROJECT TITLE: - DESIGN AND DEVELOPMENT OF AGRICULTURAL ROVER.**

**Abstract :-**

The concept of agricultural rovers, or robots designed to work in agriculture, is a relatively recent development. The first agricultural robots were developed in the 1990s, and since then technology has advanced rapidly.

The development of agricultural robots has been driven by a need to increase efficiency and reduce labor costs in agriculture, as well as a desire to reduce the environmental impact of farming practices. As the technology continues to improve, it is likely that we will see more and more robots in agriculture in the years to come.

The proposed modification increases in the stability margin and proved with valuable and profitable contrasting with the 3D model. If the system is installed in heavy vehicles and conventional off road vehicles, it will definitely decrease the complexity as well as power requirements to retain bumping within it.

Agricultural rovers are to improve the efficiency, productivity, and sustainability of agricultural operations, while also reducing labor costs and improving the safety of farming operations.

**Project Photo:-**





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**Name of Students :-**

- 1) Waghmode Rohan A.
- 2) Waghmare Sagar A.
- 3) Gonde Kshitij V.
- 4) Chavan Kshitij S.

**Guide Name :-** Prof. S. R. Shaikh

**PROJECT TITLE: - RECIPROCATING MOTION USING INCLINED DISC MECHANISM.**

**Abstract :-**

Device for converting reciprocating motion into rotary motion and vice versa, in axial-piston mechanical systems. The invention relates to a highly efficient device for converting the reciprocating motion of the pistons into rotary movement of the shaft and vice versa in the axial-piston, mechanical systems of engines, pumps compressors, which has an increased contact resistance to the power load, and makes it possible to increase several times the torque, as a result of a shorter kinematic chain and overcoming the kinematic constraints on the torque of the output shaft that are created by the working stroke of the pistons. Four types of the Device have been developed, where the kinematic chain in two of them has three links, and in the other two - four links, finding application respectively in the structures of hydraulic motors and pumps, and internal combustion engines. The Device is also used in air piston compressors, and can be used in all other devices that include mechanisms for converting a reciprocating motion into rotary motion and vice versa.

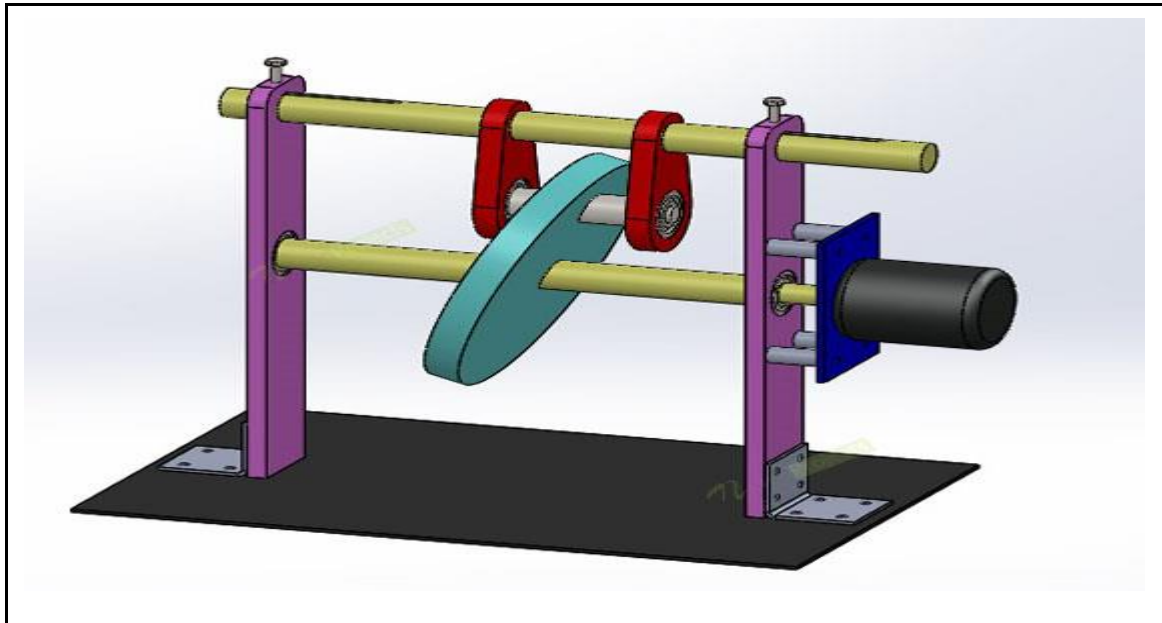
**Name of Students :-**

- 1) Bagade Omkar
- 2) Deshpande Kaustubh
- 3) Palem Nishant

**Guide Name :-** Prof. R. S. Nagmode



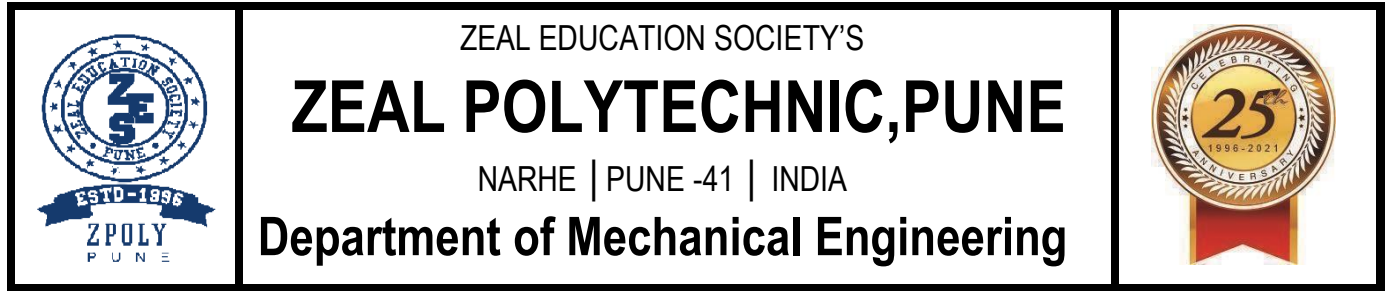
**Project Photo :-**



**PROJECT TITLE: - AUTOMATIC BABY CRADLE.**

**Abstract :-**

Generally, the baby cradle is used to make sleep and soothe the baby. For example, the guardian has to take care of their child until they asleep. In this project, we did one solution for a baby bed. In this project, we used servo motors, sound sensors and dry or wet conditions on the baby bed and the value was sent to a Thingspeak cloud in this project. The baby is sleeping on the cradle. That time the baby is crying means the sound sensor has found the baby crying sound. If a baby is crying, it means the guardian of the baby comes and soothes the cradle. But in the solution when the sound sensor found the crying sound at the same time automatically the cradle is soothing to the baby which means the servo motor operated with a particular angle. The rain sensor is used to find the dry or wet condition on the baby bed. In this project, we upload the value through the esp8266 Wi-Fi module into IOT cloud Thing speak.



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- 1) Sagade Ajay V.
- 2) Waghmare Kashinath S.
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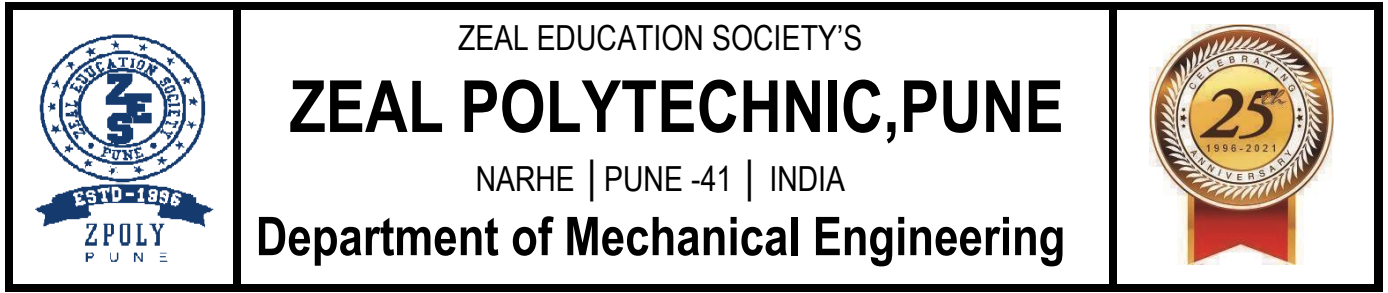
**PROJECT TITLE: - AUTOMATIC SAND FILTER & SEPARATOR.**

**Abstract:-**

Construction sites are notorious for generating a large amount of waste, including sand, debris, and sediment. These materials can cause environmental pollution and pose a threat to human health. Therefore, the development of an effective sand filter and separator is of paramount importance to reduce the environmental impact of construction activities.

This project aims to design and develop a sand filter and separator for use in construction sites. The sand filter and separator will be capable of removing sand and other particulates from wastewater generated during construction activities. The system will comprise multiple stages of filtration, including a coarse filter, a fine filter, and a separator, which will remove particles of different sizes. The design of the sand filter and separator will be based on the principles of sedimentation and filtration. The system will use gravity to separate the sand and other particulates from the wastewater. The sand filter and separator will be designed to be compact, easy to install and maintain and cost-effective.

The project will involve the construction of a prototype sand filter and separator system and testing the efficiency of the system in removing sand and other particulates from wastewater generated during construction activities. The efficiency of the system will be evaluated based on the quality of the treated water and the amount of sand and other particulates removed from the wastewater. The successful development of the sand filter and separator system will contribute to reducing the environmental impact of construction activities and promoting sustainable construction practices.



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- 1) Sabale Swapnil
- 2) Giri Pratiksha
- 3) Bhagwat Yashraj

**Guide Name :-** Prof. A. S. Mohammad

**PROJECT TITLE: - PNEUMATIC OPERATED VICE.**

**Abstract :-**

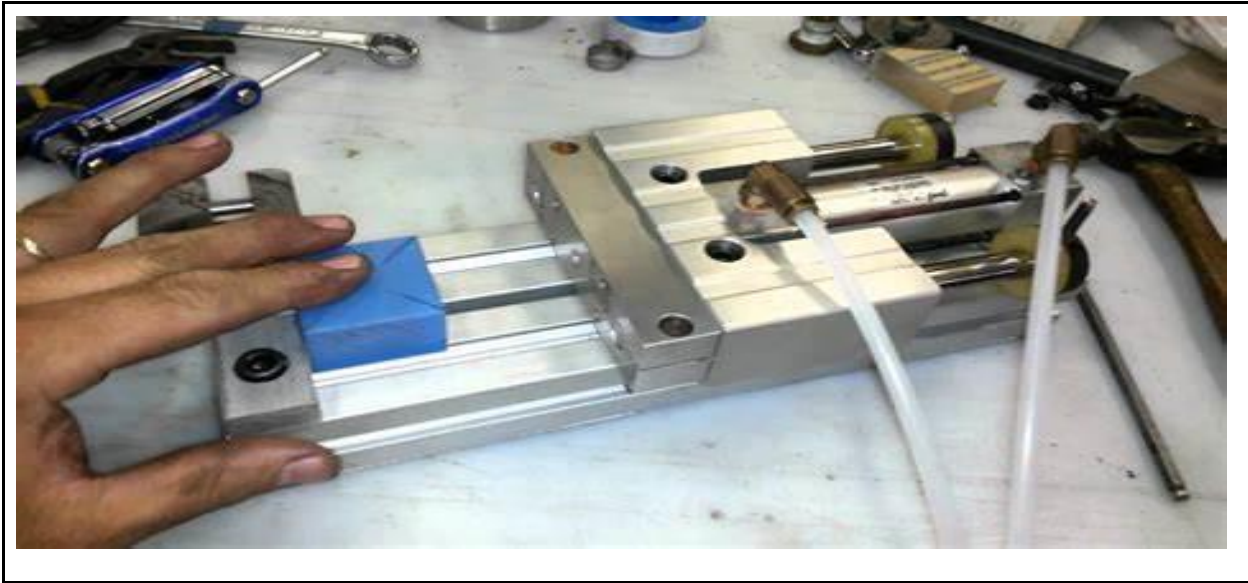
Pneumatic systems are safer than electromotive systems because they can work in an inflammable environment without causing fire or explosion. Apart from that, overloading in a pneumatic system will only lead to sliding or cessation of operation. Unlike electromotive components, pneumatic components do not burn or get overheated when overloaded. The operation of pneumatic systems does not produce pollutants. The air released is also processed in special ways. Therefore, pneumatic systems can work in environments that demand a high level of cleanliness.

A pneumatic vice is its ability to exert a high clamping force with minimal effort. This can be particularly useful when working with heavy or bulky materials that are difficult to hold in place using a manual vice. In addition, a pneumatic vice can be operated more quickly than a manual vice, which can help to increase productivity in certain types of manufacturing processes.

Pneumatic systems are safer than electromotive systems because they can work in an inflammable environment without causing fire or explosion. Apart from that, overloading in a pneumatic system will only lead to sliding or cessation of operation. Unlike electromotive components, pneumatic components do not burn or get overheated when overloaded. The operation of pneumatic systems does not produce pollutants. The air released is also processed in special ways. Therefore, pneumatic systems can work in environments that demand a high level of cleanliness.



**Project Photo :-**



- Name of Students: -**
- 1) Khan Shoaib Babar
  - 2) Badade Siddharth Santosh
  - 3) Kamate Hrishikesh Santosh
  - 4) More Sanket Dada

**Guide Name :-** Prof. N. N. Kokare

**PROJECT TITLE: - DESIGN & FABRICATION OF INDUSTRIAL CONVEYOR USING FOUR BAR MECHANISM.**

**Abstract :-**

This machine is basically works on the principle of Single Slider Crank Mechanism which is the heart of this machine and it converts rotary motion into a reciprocating motion. This machine makes use of the transfer of product from one place to another place with the help of a conveyor, the conveyor rotation is based on the crank mechanism. There has been a serious demand for intermittent





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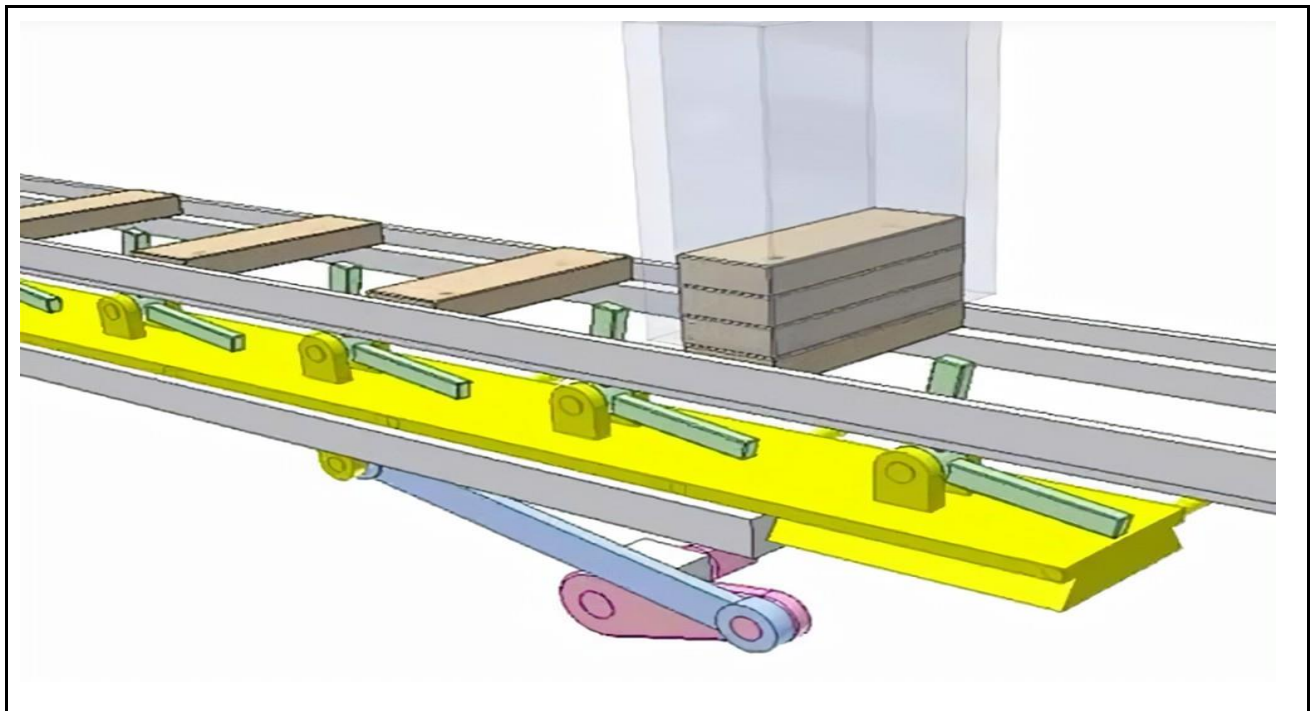


movement of packages in the industries. Though continuous movement is more or less important in the same field the sporadic motion has become essential.

It is observed that the system has a time delay between moving packages and this delay can be used to introduce any alterations in the package or move the package for any other purpose and Likewise. While in the conveyor system such actions cannot be performed unless a programmed module is used to produce intermittent stopping of the belt which is costly.

The present work of this project is to design and fabricate industrial conveyors using four bar mechanisms. The objective of our project is to produce a mechanism that delivers this stop and move motion using mechanical linkages. We will also optimize the process time of transporting the product from one place to another within the shortest possible time.

**Project Photo :-**



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- 3) Dhamdhare Atharv Ravindra
- 4) Kulkarni Abhay Sudhakar

**Guide Name :-** Prof. S. R. Shaikh

**PROJECT TITLE: - DESIGN & MANUFACTURING OF HOOD OF LED LAMP.**

**Abstract :-**

The design of the hood component in LED lamps plays a crucial role in thermal management, light distribution & glare control. This project aimed to design & optimize the performance of the hood in LED lamps by conducting a literature review, designing & manufacturing a prototype hood & testing its performance parameters. The project involved several design specifications such as thermal conductivity, surface finish, geometry, size, mounting, material durability & cost. The prototype hood was tested for its performance in light distribution, thermal management & glare control. The project concluded that the hood of an LED lamp is a critical component in the performance, longevity & aesthetics of the lamp. Future research in this area can focus on exploring novel materials, optimization of geometry, integration of smart control systems & adaptive thermal management, advancement of manufacturing techniques & implementation of sustainability features.

**Project Photo :-**





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- 2) Gajghate Suyash Arjun
- 3) Hiremath Abhishek Shivkumar
- 4) Pisal Yash Kantaram

**Guide Name: -** Prof. S. G. Aghor

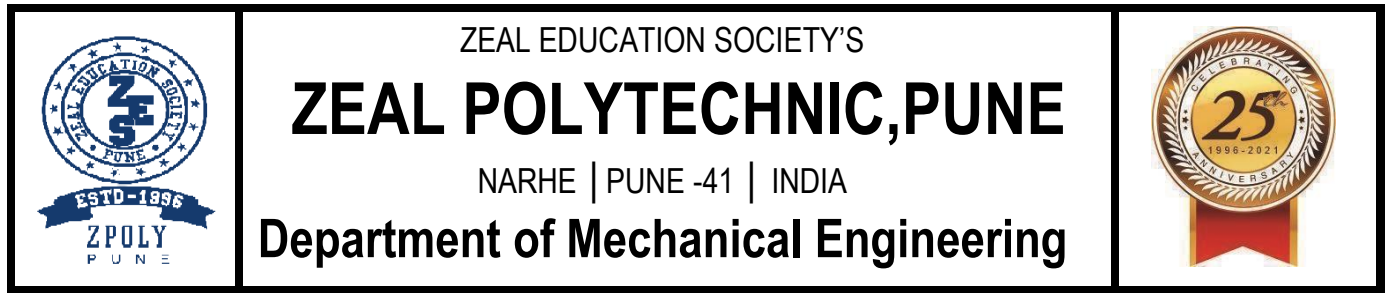
**PROJECT TITLE: - DESIGN & MANUFACTURE OF SIDE PLATE OF LED LAMP.**

**Abstract:-**

The side plates of a LED lamp are typically made of a durable, heat-resistant material such as metal or plastic. These side plates are designed to support and protect the internal components of the lamp, including the LED bulbs, wiring, and circuit boards. The side plates also help to dissipate heat generated by the lamp, ensuring that it operates at a safe and efficient temperature. In some cases, the side plates may be designed with decorative or aesthetic features, such as a sleek or modern design, to enhance the overall appearance of the lamp.

The side plate of a LED lamp is necessary for several reasons: It provides structural support and stability to the lamp, ensuring that it does not wobble or become loose over time. It helps to protect the internal components of the lamp from damage, such as by preventing dust and other debris from entering the lamp. It can help to improve the overall aesthetics of the lamp, by providing a clean and uniform appearance. It can also provide additional functionality, such as by allowing the lamp to be mounted on a wall or ceiling, or by providing a surface for attaching additional accessories or controls. Overall, the side plate of a LED lamp is an essential component that helps to ensure the proper functioning and longevity of the lamp.

The objective of the side plate for a LED lamp is to provide structural support and stability to the lamp, as well as protect the internal components from damage. It also acts as a heat sink, helping to dissipate heat generated by the LED lights, which increases the lamp's lifespan and efficiency. Additionally, the side plate can be used to attach the lamp to a mounting surface or fixture, and can be designed to enhance the lamp's aesthetic appearance.



The theme of the side plate for the led lamp could be minimalist and modern, with clean lines and a sleek design. The color scheme could be monochromatic, with shades of black, white, or gray to enhance the minimalist aesthetic. Alternatively, the side plate could feature a geometric pattern or texture to add visual interest and a touch of whimsy to the overall design.

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- 2) Dighe Shivam Popat
- 3) Phutane Vishwesh Yogendra
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