



SAPTHAGIRI
College of Engineering
Creating Tomorrow



2020-21

MINI-PROJECTS

DEPARTMENT OF
MECHANICAL ENGINEERING

INDEX

Sl. No.	TITLE OF THE MINI PROJECT	Pg No.
1.	Mechanical Ventilator	2
2.	Voice Controlled Bluetooth Car	3
3.	Hydro Power Generation	4
4.	Delta 3d Printing Robot With Cost Effective Innovations	5
5.	Bench Saw Machine	6
6.	Hydro Power Generation	7
7.	Tree Transplantation Hydraulic Machine	8
8.	Model Of Air Compressor Using A Syringe	9
9.	Design And Fabrication Of Mini Centrifugal Pump	10
10.	Geneva Wheel Mechanism	11
11.	Automated Feed Point Mechanism	12
12.	Pneumatic Gun	13
13.	Conveyor Using Geneva Mechanism	14
14.	Rocker-Bogie Mechanism	15

“MECHANICAL VENTILATOR”

AMIT A PATIL

CHEZHAN S

HALEMBREAMBIKA

JEEVITH ARVIND

MANJUSHREE K

1SG18ME009

1SG18ME021

1SG18ME029

1SG18ME038

1SG18ME050

Guide

DR. TULSIDAS D

ASSOCIATE PROFESSOR

The main objective for the research was construction of a low-cost, open-source mechanical ventilator. The motivation for constructing this kind of ventilator comes from the worldwide shortage of mechanical ventilators for treating COVID-19 patients the COVID-19 pandemic has been striking hard in some regions, especially the deprived ones. Constructing a low-cost, open-source mechanical ventilator aims to mitigate the effects of this shortage on those regions. The equipment documented here employs commercial spare parts only. This paper also shows a numerical method for monitoring the patients' pulmonary condition. The method considers pressure measurements from the inspiratory limb and alerts clinicians in real-time whether the patient is under a healthy or unhealthy situation. Experiments carried out in the laboratory that had emulated healthy and unhealthy patients illustrate the potential benefits of the derived mechanical ventilator.



“VOICE CONTROLLED BLUETOOTH CAR”

PRASHANTH B S
PRASHANTH P
PRATHAP N
PRITHVI K
CHANDAN YS
SHASHIDHARAN R

1SG18ME061
1SG18ME062
1SG18ME063
1SG18ME064
1SG19ME403
1SG18ME079

Guide

DR.R.G. DESHPANDE
ASSOCIATE PROFESSOR

The aim of our project is to make a Voice Control Robot Car. The working is based on Arduino micro-controller, motor drivers, a Bluetooth module. Arduino is an open-source hardware (single-board microcontrollers and kits) used for building digital devices. The idea is to first design the Hardware of the Robot Car and then code the entire working using our previous knowledge of programming. The code will then be simulated on software (IDE) and later be interfaced with the hardware. The coordination of control unit with Bluetooth gadget is accomplished utilizing a Bluetooth module to catch and read the voice orders. The controlling remote is a smart android device with Bluetooth Application. We picked this as our project as robotics has become a major part of our everyday lifestyle and also have a wide scope in the engineering field. It plays a vital role in the development of new technology



“HYDRO POWER GENERATION”

AKSHAY K	(1SG18ME007)
AMAR SINGH	(1SG18ME008)
ASHISH HG	(1SG18ME013)
LOKENDRA N	(1SG18ME047)
M V GAGAN	(1SG18ME048)

Guide

PROF. MOHAN REDDY
ASSISTANT PROFESSOR

The goal of this project is to design and build a hydroelectric power system for use in rural parts of India which do not currently have power, but do have access to streams and small waterfalls. There are many parts of this project which will be required before the end of the year. I will be spending the first semester designing the turbine and building it using various inexpensive or reused parts. The second semester will primarily consist of finding ways to bring this to market on a large enough scale to make an impact. In terms of deliverables, the first is building a micro hydro turbine which is inexpensive enough in terms of parts to be sold in rural and extremely poor areas of a developing country like India. The second would be to write a proposal/business plan for how one could viably take this product to market and have the desired impact of providing power to extremely poor regions of India. If the project is successful, then hopefully a complete blue-print would be in place for anyone to try to bring electricity to the most rural and remote regions of India which have been largely left behind as India has developed over the past ten years



“DELTA 3D PRINTING ROBOT WITH COST EFFECTIVE INNOVATIONS”

AAKASH P

(1SG18ME001)

AJEETH N

(1SG18ME005)

BHARATH K V

(1SG18ME016)

DEEKSHITH GOWDA B M

(1SG18ME022)

Guide

DR. TULSIDAS D

ASSOCIATE PROFESSOR

The project we are working on is a “Delta Style 3D Printer” with certain cost-effective modifications. In today’s world 3D Printers are revolutionizing the prototyping industry. They are used almost everywhere. The biggest drawback is the huge upfront costs. Hence, we have decided to tap the technology in a much cheaper way and at the same time not to sacrifice the quality.

The printing technology works on the principle of stacking individual 2 Dimensional (ideally) layers of predefined thickness one upon the other to create a true 3 Dimensioned object. This method is known as additive manufacturing as the process involves addition of raw material rather than removal of material. The biggest pro of this method is its high accuracy. Specifically, for this build we are adopting a method called "software tuning". That is, since most of the build is by hand, there would be higher inaccuracies that could severely affect the output. By compensating for the mechanical errors through software, we are able to get micrometer accuracy in a much efficient and cost-effective way.



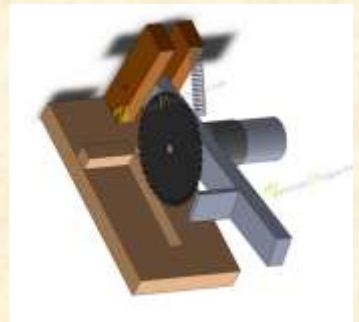
“BENCH SAW MACHINE”

PRIYANKA H S	(1SG18ME065)
KEERTHI G	(1SG18ME041)
ARUNKUMAR R	(1SG18ME010)
ADARSH KUMAR P V	(1SG18ME004)

Guide

PROF. MOHAN REDDY
ASSISTANT PROFESSOR

A bench saw or table saw has long been used for woodworks and metal works. It can be used with a variety of blades to achieve various fabrication applications. Table saw's consist of electric motors that are used to drive rotating saw blades. The saw blade is mounted on an arm that can be moved to achieve desired cutting. Our system demonstrates the design and fabrication of a bench saw using our mini bench saw model that uses an electric motor with shaft to mount various blades and achieve efficient cutting. We use an arm with spring mounted pull back system for instant pullback when pressure is not applied. We design the motor shaft to achieve desired cutting by mounting various types of blades on machine. The machine has a frame bed in order to achieve full cutting when blade passes through the workpiece. The entire system is integrated and fabricated accordingly to achieve required mechanism.



“HYDRO POWER GENERATION”

DOCTOR BABU C	(1SG18ME026)
GNANESH S H	(1SG18ME028)
HEMANTH KUMAR K	(1SG18ME032)
KIRAN KUMAR P	(1SG18ME043)
KISHORE K V	(1SG18ME044)

Guide

PROF .SATISH KUMAR Y D
ASSISTANT PROFESSOR

The goal of this project is to design and build a hydroelectric power system for use in rural parts of India which do not currently have power, but do have access to streams and small waterfalls. There are many parts of this project which will be required before the end of the year. I will be spending the first semester designing the turbine and building it using various inexpensive or reused parts. The second semester will primarily consist of finding ways to bring this to market on a large enough scale to make an impact. In terms of deliverables, the first is building a micro hydro turbine which is inexpensive enough in terms of parts to be sold in rural and extremely poor areas of a developing country like India. The second would be to write a proposal/business plan for how one could viably take this product to market and have the desired impact of providing power to extremely poor regions of India. If the project is successful, then hopefully a complete blue-print would be in place for anyone to try to bring electricity to the most rural and remote regions of India which have been largely left behind as India has developed over the past ten years.



“TREE TRANSPLANTATION HYDRAULIC MACHINE”

ABHISHEK N	(1SG18ME003)
CHETHAN H N	(1SG18ME020)
HEMANTH B V	(1SG18ME030)
HEMANTH GOWDA V	(1SG18ME031)
HEMANTH KUMAR R K	(1SG18ME034)
TEJAS L	(1SG19ME429)

Guide

PROF. THEJAS M S
ASSISTANT PROFESSOR

A tree spade system for providing a vehicle-mounted system capable of excavating large and heavy plants and transporting them while locking the system into place to prevent damage to the vehicle and plant the tree spade system includes a vehicle with a tilting mechanism, lifting mechanism and digging apparatus. The digging apparatus utilizes dual hydraulic cylinders to draw the digging blades into the soil surrounding the plant to be removed and transported. The digging apparatus is designed with the lowest profile possible to minimize the removal of lower branches from the plant to be transported. When the digging apparatus is lifted and tilted back upon the vehicle the system has a unique locking mechanism for holding the digging apparatus into place.



Hydraulic actuation

All the movements above are controlled hydraulically by syringes attached to each one. The hydraulic supply acts like the arm's heart and muscles. It provides the energy for pushing, pulling, turning and lifting.

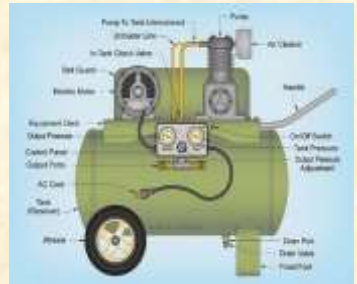
“MODEL OF AIR COMPRESSOR USING A SYRINGE”

CHETHAN. V (1SG19ME404)
GOUTHAM. K (1SG19ME407)
JAIRAJ H YADAV (1SG19ME409)
NAGESHA V.R (1SG19ME414)
PRAJWAL S.P (1SG19ME419)

Guide

PROF. RAM KUMAR. M
ASSISTANT PROFESSOR

Air compressors are used as versatile tool throughout the industries for a variety of purposes. They are used for various applications in manufacturing plants such as driving pneumatic tools, air operated controlling equipment's, conveying of fly ash etc.. . Air compressors are one of the major sources of energy consumption in industries. In the present scenario, the importance of energy conservation is increasing day by day. For a manufacturing plant, improving energy efficiency or replacement of less energy efficient equipment with energy efficient ones can earn significant savings. In the manufacturing plant, it was found that compressors which are running were installed in the earlier stages. Due to aging, the efficiency of compressor decreased and it resulted in huge expense. As a solution, the performance assessment of the compressors were done. Compressor with an energy efficiency less than 35% is replaced with energy efficient Compressor. Modification in the compressor air system was done to improve efficiency. The latest trend in the automotive industry is to develop light weight vehicles. Every automotive industry is looking to reduce the weight of the vehicle as it helps in the better handling of the vehicle and increases the efficiency of the vehicle.



“DESIGN AND FABRICATION OF MINI CENTRIFUGAL PUMP”

MONEETH KUMAR B (1SG19ME413)
PRAVEEN C (1SG19ME421)
ROHITH AN (1SG19ME423)
SANJAY L (1SG19ME426)
TEJAS J S (1SG19ME428)

Guide

PROF. RAM KUMAR. M
ASSISTANT PROFESSOR

The report introduces and describes the principle and its performance of “centrifugal pumps” centrifugal pumps are used to transport fluids by the conversion of rotating kinetic energy to the hydraulic energy to the hydrodynamic energy of the fluid flow its common uses as sewage petroleum and petrochemical pumping. A centrifugal is commonly used to implement a vacuum cleaner. If the mechanical energy is converted into pressure energy by means of centrifugal force acting on the fluid, the hydraulic machine is called centrifugal pumps. It works on a principle of vortex flow. The centrifugal pumps acts as a reversal of an inward radial outward directions. The mains of the centrifugal pumps are impeller casting suction pipe with a foot valve and a strainer, delivery pipe etc.



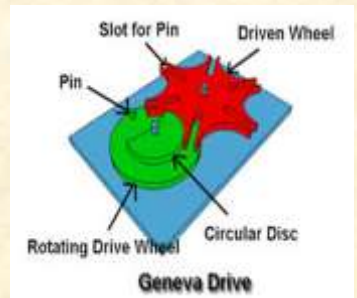
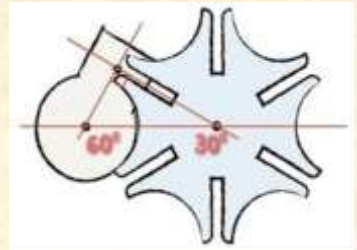
“GENEVA WHEEL MECHANISM”

MANJESH K	1SG18ME049
MANOJ N	1SG18ME053
PAVAN K R	1SG18ME053
SATYA RAJ	1SG18ME076

Guide

PROF. RAM KUMAR. M
ASSISTANT PROFESSOR

This paper presents the development of a simulation project that can be used to enhance Undergraduate teaching and student understanding of mechanical engineering design subjects. The goal is to use the simulation capabilities of the software to enhance the teaching environment and student learning outcomes of these courses. For instance, this example project shows how students benefit from the simulation by understanding the kinematic and dynamic behavior of the mechanism, and also verifying the stress analysis of critical members via simple hand calculation preliminary assessment to the approach was conducted via a web-based survey. The survey contained several questions aiming to gauge students overall opinion of the use of the software packages in the courses. The overall results are very positive and warrant further exploration and use of the approach.



“AUTOMATED FEED POINT MECHANISM”

AMRUTHADARSHINI
ASHA N
ASHA M

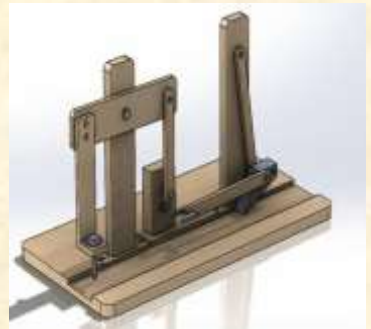
(1SG19ME400)
(1SG18ME012)
(1SG18ME011)

Guide

PROF. THEJAS M S
ASSISTANT PROFESSOR

Now days there are many efforts being made for taking away the burden on the humans.

For this purpose there are many efforts going on for the atomization of machines. This paper has taken up the fabrication of ‘automatic feeding and cutting mechanism this machine automatically feeds its stock and performs the cutting operation. It involves simple lever mechanism. Here the power input for the machine is provided by means of the motor. It involves simple mechanisms will transfers the motion form one form to other. This mechanism is very u9sefull in making holes on metal sheet on industries by changing the tool. By using this mechanism of for stitching of big bags in agriculture.



“PNEUMATIC GUN”

**P K SHASHIDAR
PRAJWAL R
ABHILASH CP
DHANUSH G
JAYANTH T
LIKHITH R**

**1SG17ME054
1SG17ME058
1SG18ME002
1SG18ME023
1SG18ME037
1SG18ME046**

Guide

**DR. TULSIDAS D
ASSOCIATE PROFESSOR**

A pneumatic gun for ballistic delivery of microparticles to soft targets is proposed and demonstrated. The particles are accelerated by a high speed flow of Helium in a capillary tube. Vacuum suction applied to a concentric, larger diameter tube is used to divert substantially all of the flow of Helium from the gun nozzle, thereby preventing the gas from hitting and damaging the target. Speed of ejection of micron-sized gold particles from the gun nozzle, and their depth of penetration into agarose gels are reported.



“CONVEYOR USING GENEVA MECHANISM”

M D SHAHID

(1SG18ME054)

PRAJWAL S

(1SG18ME060)

SACHIN K T

(1SG18ME071)

SANDESH R

(1SG18ME074)

SANJAY PRASAD R P

(1SG18ME075)

YASHWANTH B G

(1SG18ME096)

Guide

**DR. BASAVARAJ GANIGER,
ASSISTANT PROFESSOR**

Geneva mechanism is a system to convert continuous circular motion into fixed step circular motion. Fixed step circular motion in other words means a circular motion produced in equal spaces of time and resulting in the same displacement which is a requirement in many automation industries. A conveyor belt is simply a linear belt mostly made up of rubber (of greater stability). It has a basic function of transporting raw material/ material in process of manufacturing. A simple Geneva mechanism consists of a drive wheel and a driven wheel. The drive wheel is a disk with a pin or a shaft near its circumference. The driven wheel consists of several slots. The drive wheel is kept next to the driven wheel in such a way that when the drive wheel is rotated, the pin or shaft fits inside the slot. As it reaches the bottom most point of the slot, the pin exerts a force on the driven wheel. As the driven wheel is pivoted from the centre, there will be a generation of a moment. This causes the generation of a torque which rotates the driven wheel.



“ROCKER-BOGIE MECHANISM”

MANOJ KUMAR K N
SHANTHANU H M
TEJAS P
VISHWAJEETH S PATTAR
VIVEK S

1SG18ME051
1SG18ME077
1SG18ME087
1SG18ME094
1SG20ME095

Guide

PROF. RAMESH N G
ASSISTANT PROFESSOR

The Project work "Rocker Bogie mechanism Geosurvey Rover" deals with the important aspect of improving the rover from its previous designs. The Geosurvey rover has to operate on rough and harsh environments for which it was designed but several factors restrict its operational capabilities, so the focus of our research is to overcome restrictions or to decrease it to within an acceptable range for its smooth performance. Our research on the restrictions of the rover conducted by our team focused mainly on the drive system and its drive modules which were not efficient, the linkage, the overturning or tilt range of the rover and the battery inefficiency from the other restrictions and problems that were obtained from the literature review and research so, we conducted research on how to improve that. The rover has been completely made from PVC to increase its capability to withstand shocks, vibrations and mechanical failures caused by the harsh environment where it is operated on. Using CAD software the design of the rover has been fine-tuned and by experimenting with prototypes and models of the rover in the experimental setup of the live test, improvements and feature were included into the Geo-survey rover.

