

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

**“Jnana Sangama”, Belgaum-590018**



**A**

**PROJECT REPORT**

**ON**

**“TIME-MOTION STUDY AND LINE BALANCING FOR  
SCANIA P140 TRUCK”**

Submitted in Partial fulfillment of the Requirements for the VIII Semester of the Degree  
of Bachelor of Engineering

**In**

**MECHANICAL ENGINEERING**

For the academic year 2016-17

Submitted By

- |                                  |                            |
|----------------------------------|----------------------------|
| 1. DEEPAK .N (1GV13ME013)        | 2.GOKUL.R.S (1GV13ME019)   |
| 3. KISHORE KUMAR .R (1GV13ME028) | 4.PRASHANTH.C (1GV13ME071) |

Under the Guidance of

**INTERNAL GUIDE**

**Manjunath .B.N**

**Associate Professor,**

**Dept. of Mech. Engg**

**Dr. TTIT**

**EXTENAL GUIDE**

**Mr. Thyagaraj M**

**Senior Manager, RPC**

**Scania Commercial Vehicles**

**India Private Limited.**



**DEPARTMENT OF MECHANICAL ENGINEERING**

**Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY**

**Oorgaum, Kolar Gold Fields – 563 120**

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

**“Jnana Sangama”, Belgaum-590018**



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3. KISHORE KUMAR .R (1GV13ME028)        4.PRASHANTH.C (1GV13ME071)

Under the Guidance of

**INTERNAL GUIDE**

Manjunath .B.N  
Associate Professor,  
Dept. of Mech. Engg  
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**EXTENAL GUIDE**

Mr. Thyagaraj M  
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**DEPARTMENT OF MECHANICAL ENGINEERING**

**Dr. T.THIMMAIAH INSTITUTE OF TECHNOLOGY**

**Oorgaum, Kolar Gold Fields – 563 120**

# Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY

Oorgaum, Kolar Gold Fields – 563 120

DEPARTMENT OF MECHANICAL ENGINEERING



## CERTIFICATE

This is to certify that the Project entitled “TIME-MOTION STUDY AND LINE BALANCING FOR SCANIA P140 TRUCK” has been carried out by

1. DEEPAK .N (1GV13ME013)
2. GOKUL.R.S (1GV13ME019)
3. KISHORE KUMAR .R (1GV13ME028)
4. PRASHANTH.C (1GV13ME071)

The students of **Dr. T. Thimmaiah Institute of Technology** in partial fulfillment for the award of **Bachelor of Engineering in Mechanical Engineering** of the **Visvesvaraya Technological University, Belgaum** during the year **2016-2017**. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the Report deposited in the departmental library.

23/06/17

Guide

Mr. Manjunath B.N

27/6/17

Head of The Department

Dr. P.D. Sudersanan

27/6/17

Principal

Dr. Syed Ariff

Name of External Examiners

1. GOPALA GOWDA HK
2. Dr. P. D. Sudersanan

Signature with Date

1.   
27/6/17
2.   
27/6/17



**SCANIA**

Scania Commercial Vehicles India  
Private Limited

1<sup>st</sup> June, 2017

**TO WHOMSOEVER IT MAY CONCERN**

This is to certify that Mr. Deepak N, Student from Dr. T. Thimmaiah Institute Of Technology has undergone Project on " Time – Motion Study And Line balancing Of Scania Truck" in RPC organization under the guidance of Mr. Thyagaraj M, Senior Manager, RPC from 27 February, 2017 to 05 May, 2017.

We wish him/her all the success in future endeavors.

for Scania Commercial Vehicles India Pvt. Ltd.,

Deepak Bhat  
Sr. Manager – HR

Commercial Vehicles India Private Limited

4-66, 88-97

KIADB Industrial Area,

Challi Village, Narsapura Hobli,

District Kolar - 563 133, Karnataka.

+91 0815 - 228 8300

CIN : U35999KA2011FTC056984

1<sup>st</sup> June, 2017

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. Gokul R.S, Student from Dr. T. Thimmaiah Institute Of Technology has undergone Project on " Time – Motion Study And Line balancing Of Scania Truck" in RPC organization under the guidance of Mr. Thyagaraj M, Senior Manager, RPC from 27 February, 2017 to 05 May, 2017.

We wish him/her all the success in future endeavors.

for Scania Commercial Vehicles India Pvt. Ltd.,

  
Deepak Bhat  
Sr. Manager – HR



**SCANIA**

Scania Commercial Vehicles India  
Private Limited

1<sup>st</sup> June, 2017

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr. Kishore Kumar R, Student from Dr. T. Thimmalah Institute Of Technology has undergone Project on " Time – Motion Study And Line balancing Of Scania Truck" in RPC organization under the guidance of Mr. Thyagaraj M, Senior Manager, RPC from 27 February, 2017 to 05 May, 2017.

We wish him/her all the success in future endeavors.

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Deepak Bhat  
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CIN : U35999KA2011FTC056984



**SCANIA**

Scania Commercial Vehicles India  
Private Limited

1<sup>st</sup> June, 2017

**TO WHOMSOEVER IT MAY CONCERN**

This is to certify that Mr. Prashanth C, Student from Dr. T. Thimmaiah Institute Of Technology has undergone Project on " Time – Motion Study And Line balancing Of Scania P140 Truck" in RPC organization under the guidance of Mr. Thyagaraj M, Senior Manager, RPC from 27 February, 2017 to 05 May, 2017.

We wish him/her all the success in future endeavors.

for Scania Commercial Vehicles India Pvt. Ltd.,

Deepak Bhat  
Sr. Manager – HR

**Commercial Vehicles India Private Limited**

66, 88-97

KIADB Industrial Area,

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District Kolar - 563 133, Karnataka.

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## ABSTRACT

In this project, we purpose a paper is to discuss related issues of time and motion study implementation and assembly line balancing and its influence toward productivity improvement.

The pattern of economic competitiveness has changed globally now days. Many countries have joined the global economic competition to capture global market in order to remain profitable and competitive by increasing its productivity. There are many factors that influence the productivity of organization. The most widely tackled issue is how to improve efficiency and productivity. Motion and time study technique is one of the productivity improvement techniques used in many production companies. Motion and time study is defined as a scientific analysis method designed to determine the best way to execute the repetitive task and to measure the time spent by an average worker to complete a given task in a fixed workplace. In production industries, assembly line balancing is another major area to be taken into consideration for increasing productivity. Throughout the study, the aim is to propose a new system to the related company to increase their productivity.

Data from a study carried out on a truck production industry, (Scania commercial vehicles India private limited) shows that motion and time study implementation and assembly line balancing contributes positively towards achieving productivity.



# Dr. T.THIMMAIAH INSTITUTE OF TECHNOLOGY

Project Report

On

## **“A Study on Experimental Stress Analysis of Curved Beam Using Strain Gauge Technique”**

Submitted in partial fulfillment of the requirement for the Eighth Semester  
Project

**Bachelor of Engineering**

**In**

**Mechanical Engineering**

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM**

By

|                   |              |
|-------------------|--------------|
| JAGADISH V R      | (1GV12ME017) |
| ANIL K S          | (1GV13ME005) |
| SANTHOSH C        | (1GV13ME052) |
| BHARATH KUMAR T N | (1GV13ME011) |

Under the Guidance

of

**MANJUNATHA BABU N S**

**Assistant Professor**



**2016-2017**

**Department Of Mechanical Engineering**

**Dr. T.THIMMAIAH INSTITUTE OF TECHNOLOGY**

Oorgaum, K.G.F. – 563 120


**Dr. T.THIMMAIAH INSTITUTE OF TECHNOLOGY**  
OORGAUM, KGF-563120




**DEPARTMENT OF MECHANICAL ENGINEERING**

**CERTIFICATE**

This is to certify that the project work entitled "A Study On Experimental Stress Analysis of Curved Beam Using Strain Gauge Technique" is a bonafide work carried out by ANIL K S (IGV13ME005), BHARATH KUMAR T N (IGV13ME011), SANTHOSH C (IGV13ME052), and JAGADISH V R (IGV12ME017) in partial fulfilment for the award of degree of bachelor of engineering in mechanical engineering of visvesvaraya technological university, belagavi during the year 2016-2017. It is certified that all corrections/ suggestions indicated for internal assessment has been incorporated in the report deposited in the department library. The project report has been approved as it satisfies the academic requirements in respect of project work prescribed for the said degree.

  
Signature of Guide

  
Signature of HOD


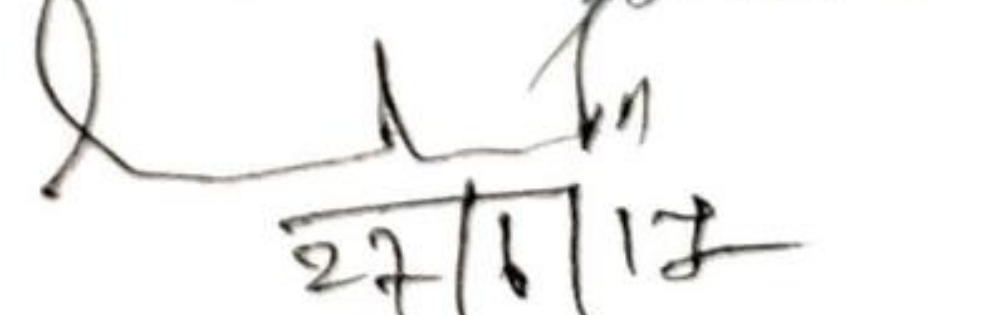
  
Signature of Principal

External Viva-Voce

Name of the Examiners

1. GOPALA Gowda H C
2. Dr. P. V. Sundararaman

Signature with Date

## ABSTRACT

Curved beams represent an important class of machine or structural members which find their application in components such as crane hook, c – clamp, frames of presses etc. The stress analysis of the critical section of the curved beam is a crucial step in its design. Based on application of load the Curved beams subjected to Plane loads are more familiar and are used for crane hooks, C-clamps etc.

The paper describes the method of stress analysis of a U – shaped specimen. The gauges are used to measure the circumferential strains along the critical section. The circumferential stresses are then calculated using Hooke's law. Together, the analytical method and lab experiment illustrates many essential elements of experimental stress analysis of a curved beam.

In present work, curved beam subjected to different loads. The bending stress are investigating by using two methods, first analytical method is used to analyze stresses are developed due to application of given loads. Second method is used FEA package ANSYS and third is an experimental analysis using strain gauge technique for bending stress analysis of curved beam under different boundary conditions. Finally the results are correlated with analytical values.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

**“Jnana Sangama”, Belgaum-590018**



**A**

**PROJECT REPORT**

**ON**

**“DESIGN AND FABRICATION OF TEST VEHICLE FOR  
REUSABLE SOUNDING ROCKET”**

**Submitted in Partial fulfillment of the Requirements for the VIII Semester of the Degree  
of Bachelor of Engineering**

**In**

**MECHANICAL ENGINEERING**

**For the academic year 2016-17**

**Submitted By**

**MAHESH.P**

**(1GV13ME031)**

**MICHAEL SIMON.S**

**(1GV13ME035)**

**NAVEEN KUMAR.K**

**(1GV13ME041)**

**Under the Guidance of**

**Dr.H.G.SHENOY**

**Professor**

**Department of Mechanical Engineering**

**Dr. TTIT**



**DEPARTMENT OF MECHANICAL ENGINEERING**

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

**“Jnana Sangama”, Belgaum-590018**



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**PROJECT REPORT**

**ON**

**“DESIGN AND FABRICATION OF TEST VEHICLE FOR  
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**(1GV13ME041)**

**Under the Guidance of**

**Dr.H.G.SHENOY**

**Professor**

**Department of Mechanical Engineering**

**Dr. TTIT**



**DEPARTMENT OF MECHANICAL ENGINEERING**

# Dr. T.THIMMAIAH INSTITUTE OF TECHNOLOGY

Oorgaum, KOLAR GOLD FIELDS – 563 120

DEPARTMENT OF MECHANICAL ENGINEERING



## CERTIFICATE

This is to certify that the Project entitled “**DESIGN AND FABRICATION OF TEST VEHICLE FOR REUSABLE SOUNDING ROCKET**” has been carried out by

**MAHESH.P** (1GV13ME031)

**MICHAEL SIMON.S** (1GV13ME035)

**NAVEEN KUMAR.K** (1GV13ME041)

the students of **Dr. T.THIMMAIAH INSTITUTE OF TECHNOLOGY** in partial fulfillment for the award of **Bachelor of Engineering in Mechanical Engineering** of the Visvesvaraya Technological University, Belgaum during the year **2016-2017**. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the Report deposited in the departmental library.

**Guide**

**Dr. H.G. Shenoy**

---

**Head of The Department**

**Dr. P.D. Sudersanan**

**Principal**

**Dr. Syed Ariff**

**Name of External Examiners**

1. Gopala Gowda HK
2. Dr. P.D. Sudersanan

**Signature with Date**

- 1.
- 2.

## ABSTRACT

A sounding rocket, sometimes called a research rocket, is an instrument-carrying rocket designed to take measurements and perform scientific experiments during its sub-orbital flight. Recently, in spite of existence of many launch demands for scientific researches using sounding rockets, the opportunities of launches are actually restricted because of high-cost of rocket launches, long period of launch preparations, and so on. In order to make the access to space for researches by the sounding rocket much easier (lower cost) and make the opportunities of the rocket launches much frequent, reusability in sounding rockets is needed. But to develop a reusable sounding rocket, a reusable test vehicle is needed first.

Our project details the design and fabrication of a reusable test vehicle (RTV) which will be used to test the systems for a reusable sounding rocket. Instead of a liquid rocket engine the RTV uses a solid rocket motor to minimise the cost and complexities. The RTV will use a parachute recovery system to bring back the rocket down safely; in addition to this the RTV will have landing legs to take the impact forces during landing. The propulsion system was ground tested and also flight test carried using a mid power rocket successfully. The data obtained from the tests are discussed in the report.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

"JNAYA SANGAMA", BELGAUM-590014



A  
Project report  
On

**"FABRICATION OF AGRICULTURAL VEHICLE"**

Submitted in the partial fulfillment of the requirements for the award of degree of

**BACHELOR OF ENGINEERING**

In

**MECHANICAL ENGINEERING**

By

**MANJUNATH HOSALLI**

**(1GV12ME022)**

**BASAVARAJ**

**(1GV14ME402)**

**TILAK N**

**(1GV14ME417)**

**YAMANAPPA KATTIMANI**

**(1GV14ME418)**

**Under the guidance of**

**External guide**  
**Mr. SADDAM**  
**Super visor (Engg)**  
**TECHNOFIST**

**Internal guide**  
**Mr. IQBAL PASHA**  
**Asst prof. Dept. of Mech**  
**Dr.TTIT, KGF**



**2016-2017**

**DEPARTMENT OF MECHANICAL ENGINEERING**

**Dr.T.THIMMAIAH INSTITUTE OF TECHNOLOGY**

**Oorgaum Post, KGF-563120**



**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

**“JNAYA SANGAMA”, BELGAUM-590014**



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Internal guide  
**Mr. IQBAL PASHA**  
Asst prof. Dept. of Mech  
**Dr.TTIT, KGF**



**2016-2017**

**DEPARTMENT OF MECHANICAL ENGINEERING**

**Dr.T.THIMMAIAH INSTITUTE OF TECHNOLOGY**

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Dr.T.THIMMAIAH INSTITUTE OF TECHNOLOGY  
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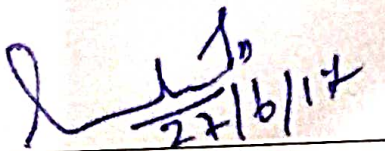


DEPARTMENT OF MECHANICAL ENGINEERING

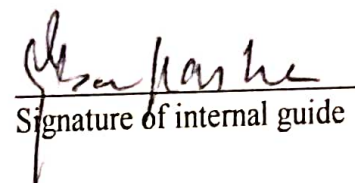
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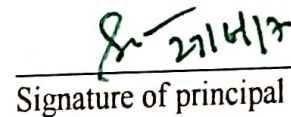
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Signature of external guide

  
27/6/17

Signature of HOD

  
Signature of internal guide

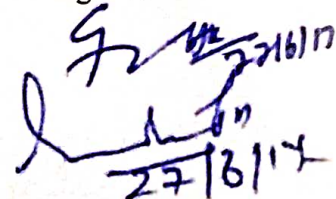
  
Signature of principal

External Viva

Name of the Examiners

1. Gopala Gowda HK
2. Dr. P. V. Sudersanam

Signature with date

  
27/6/17

## ABSTRACT

India is a country where farming is main occupation and culture then also in India most of farmers attempt suicide reason behind this is machine, as in India 10-20% of farmers are rich but rest of farmers don't have much source to purchase heavy equipment and machines.

So we are thinking that human and animal efforts can be replaced by some advanced mechanization which will be suitable for small scale farmer from economical and effort point of you. So we are developing this equipment which will satisfy all this need and to solve labour problem. To decided to design a machine which can fulfil basis need of farming and price of machine should be very less as compared for market. Main objective of machine is digging, harvesting, seed sowing, rolling & water pumping .For solving this purpose we have designed this type of machine.

This agricultural vehicle is an agricultural machine of a considerable power and great soil clearing capacity. This multipurpose system gives an advance method to sow, plow, water and cut the crops with minimum man power and labour making it an efficient vehicle. The machine will cultivate the farm by considering particular rows and specific column at fixed distance depending on crop. Moreover the vehicle can be controlled through Realy.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

**“Jnana Sangama”, Belgaum-590018**



**A**

**PROJECT REPORT**

**ON**

**“FABRICATION OF FOUR-WAY HACKSAW MACHINE”**

Submitted in Partial fulfillment of the Requirements for the VIII Semester of the Degree  
of Bachelor of Engineering

**In**

**MECHANICAL ENGINEERING**

For the academic year 2016-17

**Submitted By**

**MD. AREEF**

**(1GV13ME034)**

**MOHAMED ZAHEERUDDIN**

**(1GV13ME036)**

**MUZAMMIL AHMED**

**(1GV13ME038)**

**Under the Guidance of**

**Dr. P. D. SUDERSANAN**

**Professor & HOD**

**Department of Mechanical Engineering**

**Dr. TTIT**



**DEPARTMENT OF MECHANICAL ENGINEERING**

**Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY**

**Oorgaum, KOLAR GOLD FIELDS – 563 120**

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

**“Jnana Sangama”, Belgaum-590018**



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**PROJECT REPORT**

**ON**

**“FABRICATION OF FOUR-WAY HACKSAW MACHINE”**

Submitted in Partial fulfillment of the Requirements for the VIII Semester of the Degree  
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**MECHANICAL ENGINEERING**

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**MOHAMED ZAHEERUDDIN**

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**MUZAMMIL AHMED**

**(1GV13ME038)**

**Under the Guidance of**

**Dr. P. D. SUDERSANAN**

**Professor & HOD**

**Department of Mechanical Engineering**

**Dr. TTIT**



**DEPARTMENT OF MECHANICAL ENGINEERING**

**Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY**

**Oorgaum, KOLAR GOLD FIELDS – 563 120**

# Dr. T.THIMMAIAH INSTITUTE OF TECHNOLOGY

Oorgaum, KOLAR GOLD FIELDS – 563 120

DEPARTMENT OF MECHANICAL ENGINEERING



## CERTIFICATE

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**MD. AREEF**

(1GV13ME034)

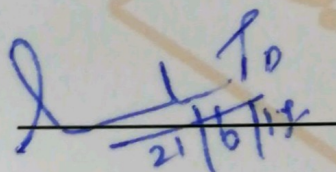
**MOHAMED ZAHEERUDDIN**

(1GV13ME036)

**MUZAMMIL AHMED**

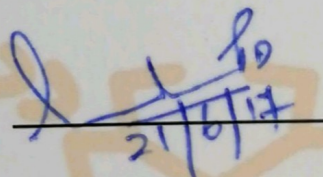
(1GV13ME038)

the students of **Dr. T.THIMMAIAH INSTITUTE OF TECHNOLOGY** in partial fulfillment for the award of **Bachelor of Engineering in Mechanical Engineering** of the Visvesvaraya Technological University, Belgaum during the year **2016-2017**. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the Report deposited in the departmental library.

  
21/6/17

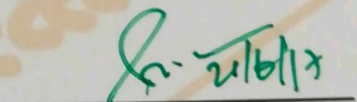
**Guide**

**Dr. P.D. Sudersanan**

  
21/6/17

**Head of The Department**

**Dr. P.D. Sudersanan**

  
21/6/17

**Principal**

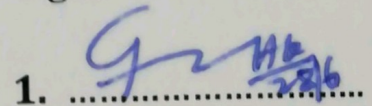
**Dr. Syed Ariff**

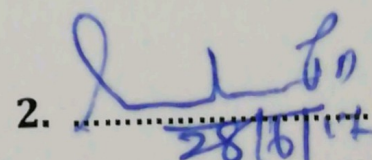
**Name of the External Viva Examiners**

1. **GOPALA GOWDA HK**

2. **Dr. P.D. Sudersanan**

**Signature with Date**

1.   
27/6

2.   
28/6/17

## ABSTRACT

In this project work an effort has been made to develop a modernized four-way hacksaw machine and less stress full operation for cutting wood, metal and plastic material. The aim of this work is to develop a hacksaw machine that will use a less effort to produce uniform cutting of PVC pipes, metals and wood. This model implies a conversion of rotary motion of crank to reciprocating motion of hacksaw blades, which is done by using Scotch Yoke Mechanism. This motion is used for hacksaw machine and in this model, we can operate four hacksaws at same time.

This model will overcome the traditional hacksaw machine which does material cutting of a single piece at particular times by cutting more material and leads to mass production. This machine works significantly with minimum vibration and jerks. Hence the proposed model of hacksaw machines will be welcomed by many industries due to compactness and efficiency and affordable price.

This project is about cutting the wood, metal, pipe, angle, channel, flat plates, rods and such other things. Due to its versatile features, it will be very useful to industries.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**  
"JNAYA SANGAMA", BELGAUM-590014



A

Project Report

on

**"MULTIFUEL ENGINE SYSTEM FOR TWO WHEELER"**

Submitted in the partial fulfillment of the requirements for the award of degree of

**BACHELOR OF ENGINEERING**

in

**MECHANICAL ENGINEERING**

by

**MOHAMED ISHAQ**

**(1GV10ME031)**

**SHYLES K**

**(1GV13ME057)**

**PUSHPENDRAKUMAR VAISHNAV S**

**(1GV11ME051)**

**MAHESH B**

**(1GV12ME021)**

**Under the guidance of**

**Internal Guide**

**MR. KIRAN DIVAKARAN**

**Associate professor**

**Dept. of Mechanical Engg.**

**Dr.TTIT, KGF**



**2016-2017**

**Department of Mechanical Engineering**

**Dr.T.Thimmaiah Institute of Technology**

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**Dr.T.THIMMAIAH INSTITUTE OF TECHNOLOGY**  
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**DEPARTMENT OF MECHANICAL ENGINEERING**

**CERTIFICATE**

This is to certify that the project work entitled **“MULTIFUEL ENGINE SYSTEM FOR TWO WHEELER”** is a bonafide work carried out by SHYLESH K(1GV13ME057), MOHAMED ISHAQ(1GV10ME031), PUSHPENDRAKUMAR VAISHNAV S(1GV11ME051), and MAHESH B (1GV12ME021) in partial fulfilment for the award of degree of bachelor of engineering in mechanical engineering of visvesvaraya technological university, belagavi during the year 2016-2017. It is certified that all corrections/ suggestions indicated for internal assessment has been incorporated in the report deposited in the department library. The project report has been approved as it satisfies the academic requirements in respect of project work prescribed for the said degree.

\_\_\_\_\_  
Signature of External Guide

  
\_\_\_\_\_  
Signature of Internal Guide

  
\_\_\_\_\_  
Signature of HOD


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External Viva-Voce

Name of the Examiners

1. GOPALA GOWDA HK
2. Dr. P. D. Sudarshan

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28/6/17

  
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28/6/17

## ABSTRACT

Multi fuel engine is any type of engine, boiler, or heater or other fuel-burning device which is designed to burn multiple types of fuels in its operation. Multi fuel engines and boilers have a long history, but the growing need to establish fuel sources other than petroleum for transportation, heating, and other uses has led to increased development of multi fuel technology for non-military use as well, leading to many flexible-fuel vehicle designs in recent decades.

Internal combustion engines typically burn either heavy fuel such as diesel, kerosene, JP5, JP8, Bio-Diesel, etc. or "light" fuels such as gasoline, ethanol or natural gas. Heavy fuel engines use the heat of compression to initiate ignition. Light fuel engines use a spark to initiate ignition. New mixed fuel (heavy & lite) engine technology allows for spark ignition of heavy and light fuel mixtures in any ratio. To our knowledge, this is the first commercial multi-fuel-mixed fuel internal combustion engine. This presents a unique opportunity for the evaluation of conventional and alternative fuel mixtures in terms of efficiency, performance and emissions. Few (if any) studies report on spark ignition performance of a wide range of heavy and light fuel mixtures. This effort includes a test bed lightweight 2-stroke multi-fuel engine installed on a battery powered EZGO golf cart. The multi-mixed fuel engine powers a 36V electrical generator/battery charger. The golf cart and engine test bed will be used to evaluate the performance/efficiency (read miles/gallon) of spark ignited heavy and light fuel mixtures. Non-profit organization that promotes the development of fuel efficient technologies for use in internal combustion engines.

Today's world facing problem of increasing environmental pollution, growing threat of depleting fossil fuels, and ever increasing uncertainty of fuel prices. Indiscriminate extraction and lavish consumption of fossil fuels have led to reduction in underground based carbon resources. This situation offers us a challenge as well as an opportunity to look for substitutes of fossil fuels for both economic and environmental benefits to the country; thus, there is urgent need to explore environment friendly, cost effective, renewable energy sources which can full fill the future energy needs. Among the various renewable energy choices, vegetable oils and biodiesel from seed oil crops have a potential for meeting the increasing requirements of petroleum and its products.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

**“Jnana Sangama”, Belgaum-590018**



**A PROJECT REPORT ON**

**“FABRICATION & PROPERTY EVALUATION OF BANANA-  
GLASS-SISAL-JUTE FIBER REINFORCED COMPOSITES”**

Submitted in Partial fulfillment of the Requirements for the VIII Semester of the Degree  
of Bachelor of Engineering

**In**

**MECHANICAL ENGINEERING**

For the academic year 2016-17

**Submitted By**

**AKSHAY R**

**(1GV13ME003)**

**SANDESH K S**

**(1GV13ME051)**

**SOURABH M**

**(1GV13ME059)**

**VARUN P**

**(1GV13ME064)**

**Under the Guidance of**

**Mr Manjunatha Babu N S**

**Asst. Professor**

**Department of Mechanical Engineering**

**Dr. TIT**



**DEPARTMENT OF MECHANICAL ENGINEERING**

**Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY**

**Oorgaum, Kolar Gold Fields - 563120**

# Dr. T.THIMMAIAH INSTITUTE OF TECHNOLOGY

Oorgaum, KOLAR GOLD FIELDS – 563 120

DEPARTMENT OF MECHANICAL ENGINEERING



## CERTIFICATE

This is to certify that the Project entitled “FABRICATION & PROPERTY EVALUATION OF BANANA-GLASS-SISAL-JUTE FIBER REINFORCED COMPOSITES” has been carried out by

AKSHAY R

(1GV13ME003)

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the students of **Dr. T.THIMMAIAH INSTITUTE OF TECHNOLOGY** in partial fulfillment for the award of **Bachelor of Engineering in Mechanical Engineering** of the Visvesvaraya Technological University, Belgaum during the year **2016-2017**. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the Report deposited in the departmental library.

Guide

Mr Manjunatha Babu N S

Head of The Department

Dr. P.D. Sudersanan

Principal

Dr. Syed Ariff

Name of External Examiners

1. GOPALA Gowda GVK
2. Dr. P.D. Sudersanan

Signature with Date

1. 27/6/17
2. 27/6/17

## **ABSTRACT**

A composite material is a combination of two or more different materials, it gives superior quality than its constituents. Composite materials can be used not only for structural applications, but also in various other applications such as automobiles, aerospace, marine, etc. Fibre reinforced plastic materials are widely used in various engineering industries because of their superior performance and tailor made properties. Though FRPs are widely used in various fields, they are flammable.

Today engineering industries are seeking to produce eco-friendly materials natural fibres have distinct properties like high strength, low weight, low cost processing and biodegradability than synthetic fibers such as glass fiber and carbon fiber. Some of the annual natural fibers are banana , jute, sisal, bamboo ,hemp etc., among these fibers banana and sisal fibers have high strength. Our present work divulges fabrication of banana-glass-jute-sisal fibers and study their mechanical properties such tensile, compression, flexular and impact test

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

**“JNAYA SANGAMA”, BELGAUM-590014**



**A**

**Project Report**

**on**

**“BUTTON OPERATED GEAR CHANGING SYSTEM IN TWO  
WHEELER”**

Submitted in the partial fulfillment of the requirements for the award of degree of

**BACHELOR OF ENGINEERING**

**in**

**MECHANICAL ENGINEERING**

**by**

**SHUBHAM KUMAR GUPTA**

**(1GV13ME056)**

**BABLU KUMAR**

**(1GV13ME010)**

**UDAYNARAYAN SAHU**

**(1GV13ME063)**

**DEEPAK KUMAR**

**(1GV13ME084)**

**Under the Guidance of**

**Mr. MOHAN KUMAR. K**

**Associate professor**



**2016-2017**

**Department of Mechanical Engineering**

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**Dr.T.THIMMAIAH INSTITUTE OF TECHNOLOGY**  
**OORGAUM, KGF-563120**



**DEPARTMENT OF MECHANICAL ENGINEERING**

**CERTIFICATE**

This is to certify that the project work entitled **"BUTTON OPERATED GEAR CHANGING SYSTEM IN TWO WHEELER"** is a bonafide work carried out by **SHUBHAM KUMAR GUPTA(1GV13ME056)**, **BABLU KUMAR(1GV13ME010)**, **UDAYNARAYAN SAHU(1GV13ME063)**, and **DEEPAK KUMAR(1GV13ME084)** in partial fulfilment for the award of degree of bachelor of engineering in mechanical engineering of visvesvaraya technological university, belagavi during the year 2016-2017. It is certified that all corrections/ suggestions indicated for internal assessment has been incorporated in the report deposited in the department library. The project report has been approved as it satisfies the academic requirements in respect of project work prescribed for the said degree.

*[Handwritten Signature]*  
20/6/17

Signature of Guide

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Signature of HOD

Head of the Department  
Dept. of Mechanical Engineering  
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External Viva-Voce

Name of the Examiners

1. **GOPALA GOWDA HK**

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Signature of Principal

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Signature with Date

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## ABSTRACT

There are disclosed an automatic gear change control apparatus for an automobile and a method of controlling such apparatus. A rotational output of an internal combustion engine is connected to drive wheels of the automobile and a load device.

When a gear shifting-up of an automatic transmission is to be effected, the load applied by the load device is increased, or the load is connected to an output rotation shaft of the engine via a selectively-connecting device, thereby reducing the rotational speed of the output rotation shaft of the engine to a required level. In this work, two electromagnetic coils are coupled to the gear rod of the two ends. The two buttons are used to activate the electromagnetic coil so that the gear will be shifted.

The main objective of our project is to perform an automatic gear change control apparatus for an automobile and a method of controlling such apparatus. A rotational output of an internal combustion engine is connected to drive wheels of the automobile and a load device. When a gear shifting-up of an automatic transmission is to be effected, the load applied by the load device is increased, or the load is connected to an output rotation shaft of the engine via a selectively-connecting device, thereby reducing the rotational speed of the output rotation shaft of the engine to a required level. In this work, two electromagnetic coils are coupled to the gear rod of the two ends. The two buttons are used to activate the electromagnetic coil so that the gear will be shifted.



**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

**“Jnana Sangama”, Belgaum-590018**



**A**

**PROJECT REPORT**

**ON**

**“Performance And Analysis Of Vertical Axis Wind Turbine By  
Changing Blade Angles And Its Positions”**

**Submitted in Partial fulfillment of the Requirements for the VIII Semester of the Degree  
of Bachelor of Engineering**

**In**

**MECHANICAL ENGINEERING**

**For the academic year 2016-17**

**Submitted By**

**VINAY KUMAR K A**

**(1GVI3ME067)**

**VISHWANATH T**

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**BODDU SHANMUKHA BRAHMAJI**

**(1GVI3ME086)**

**Under the Guidance of**

**MR. SRINIVAS A**

**Assistant Professor**

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**Dr. TTIT**



**DEPARTMENT OF MECHANICAL ENGINEERING**

**Dr. T.THIMMAIAH INSTITUTE OF TECHNOLOGY**

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# Dr. T.THIMMAIAH INSTITUTE OF TECHNOLOGY

Oorgaum, KOLAR GOLD FIELDS – 563 120

DEPARTMENT OF MECHANICAL ENGINEERING



## CERTIFICATE

This is to certify that the Project entitled “Performance And Analysis Of Vertical Axis Wind Turbine By Changing Blade Angles And Its Positions” has been carried out by

VINAY KUMAR K A

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the students of **Dr. T.THIMMAIAH INSTITUTE OF TECHNOLOGY** in partial fulfillment for the award of **Bachelor of Engineering in Mechanical Engineering** of the Visvesvaraya Technological University, Belgaum during the year **2016-2017**. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the Report deposited in the departmental library.

Guide

MR. Srinivas A

Head of The Department

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1. GOPALA GOWDA HK
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## ABSTRACT

It is well known that we rely on the nonrenewable resources such as fossil fuels, oils, natural gas, etc. Which will certainly get exhausted someday. So keeping these things into consideration we thought of generating power using non-conventional sources which is abundantly available naturally and has zero threat for extinction. Vertical-axis wind mill a type of wind turbine where the main rotor shaft is set transverse to the wind while the main components are located at the base of the turbine. This arrangement allows the generator and gearbox to be located close to the ground, facilitating service and repair.

The main advantages are they will react to wind from any direction, they can require less support components can be located at ground level, since the blades do not turn end to end, the rotor is not subjected to continuous cyclic gravity loads. These are drag-type devices with two (or more) scoops that are used in Vertical anemometers. They are always self-starting if there are at least three scoops. They sometimes have long helical scoops to give a smooth torque.

Wind energy depends upon natural terrains which have wind potential, though these terrains are not found even in nature everywhere, but those which have, are the places that can be harnessed for high potential power generation.