ACADEMIC YEAR (2021-2022)						
		J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY T.N.Palayam(po),Gobi(tk)-638506, Erode(dt).				Metric No 1.3.2
S.No	Name of the course	course code	programme offering	project work	internship	Number of students
(2021-2022) Regulation-2017						
1	Project Work	AT8811	AUTOMOBILE ENGINEEREING	✓		3
2	Automotive Chassis	AT8402	AUTOMOBILE ENGINEEREING	✓	✓	3
3	Two and Three Wheelers	AT8603	AUTOMOBILE ENGINEEREING	✓	✓	3
4	Design of Machine Elements	ME8593	AUTOMOBILE ENGINEEREING	✓		1
5	Vehicle Maintenance	AT8702	AUTOMOBILE ENGINEEREING	✓		2
6	Vehicle Body Engineering	AT8801	AUTOMOBILE ENGINEEREING	✓		3
7	Manufacturing Technology	ME8392	AUTOMOBILE ENGINEEREING		✓	2
8	New Generation and Hybrid Vehicles	AT8004	AUTOMOBILE ENGINEEREING	✓		1

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AUTOMOBILE ENGINEERING

2021-2022

S.NO	REG.NO	STUDENT NAME	PROJECT	INTERNSHIP
1	731218102001	ARUN BOOPATHI M	✓	✓
2	731218102003	LOGU P	✓	✓
3	731218102004	MOHAMMED RIYAZ KHAN M	✓	✓

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AUTOMOBILE ENGINEERING

S.No	Name of the Course that include experiential learning through Project Work/Internship/Field Visit
1	Project Work
2	Automotive Chassis
3	Two and Three Wheelers
4	Design of Machine Elements
5	Vehicle Maintenance
6	Vehicle Body Engineering
7	Manufacturing Technology
8	New Generation and Hybrid Vehicles

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PROJECT

AT8811 **PROJECT WORK** L T P C
0 0 20 10

OBJECTIVE:

- To develop the ability to solve a specific problem right from its identification and literature review till the successful solution of the same. To train the students in preparing project reports and to face reviews and viva voce examination.

The students in a group of 3 to 4 works on a topic approved by the head of the department under the guidance of a faculty member and prepares a comprehensive project report after completing the work to the satisfaction of the supervisor. The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The project work is evaluated based on oral presentation and the project report jointly by external and internal examiners constituted by the Head of the Department.

TOTAL: 300 PERIODS

OUTCOME:

- On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.

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AT8603 **TWO AND THREE WHEELERS** L T P C
3 0 0 3

OBJECTIVE:

- The aim of this course is to make the students to know and understand the constructional details operating characteristics and vehicle design aspects

UNIT I THE POWER UNIT 9

Two stroke and four stroke SI & CI engine Construction and Working, merits and demerits, Symmetrical and unsymmetrical valve & port timing diagrams. Scavenging process.

UNIT II FUEL AND IGNITION SYSTEMS 9

Fuel system – Different circuits in two wheeler fuel systems, fuel injection system. Lubrication system, Ignition systems - Magneto coil and battery coil spark ignition system, Electronic ignition System, Starting system - Kick starter system – Self starter system. Recent technologies.

UNIT III CHASSIS AND SUB-SYSTEMS 9 Main frame for two and three wheelers, its types, Chassis and different drive systems for two
wheelers, Single, multiple plates and centrifugal clutches, Gear box and its and various gear controls in two wheelers. Front and rear suspension systems. Shock absorbers. Panel meters and controls on handle bar, Freewheeling devices

UNIT IV BRAKES AND WHEELS 8

Drum brakes & Disc brakes Construction and Working and its Types, Front and Rear brake links lay-outs. Brake actuation mechanism. Spoked wheel, cast wheel, Disc wheel & its merits and demerits. Tyres and tubes Construction & its Types. Steering geometry.

UNIT V TWO & THREE WHEELERS – CASE STUDY 10

Case study of Sports bike, Motor cycles, Scooters and Mopeds - Auto rickshaws, Pick up van, Delivery van and Trailer. Servicing and maintenance. Recent developments.

TOTAL : 45 PERIODS

OUTCOME:

- The students can able to understand the various subsystem of two and three wheeler and also know how it is different from light motors and heavy motor vehicles.

TEXT BOOK:

1. Irving,P.E.," Motor cycle Engineering", Temple Press Book, London, 1992.

REFERENCES:

1. Bryaut, R.V., Vespa "Maintenance and Repair series".
2. Marshall Cavendish, Encyclopedia of Motor cycling, 20 volumes, New York and London, 1989.
3. Ramalingam. K. K., "Two Wheelers", Scitech publications, Chennai,2009
4. Raymond Broad Lambretta – "A practical guide to maintenance and repair", 1987.
5. The Cycle Motor Manual, Temple Press Ltd., London, 1990.

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AT8801 **VEHICLE BODY ENGINEERING** L T P C 3 0 0 3

OBJECTIVE:

- The main objective of this course is to impart knowledge in the construction of vehicle, aerodynamic, concept, paneling of passenger car body trim. At the end of the course the student will be well versed in the design and construction of external body of the vehicles.

UNIT I CAR BODY DETAILS **10**

Types of Car body - Saloon, convertibles, Limousine, Estate Van, Racing and Sports car – Visibility-regulations, driver's visibility, improvement in visibility and tests for visibility. Driver seat design -Car body construction-Various panels in car bodies. Safety aspect of car body.

UNIT II BUS BODY DETAILS **9**

Types of bus body: based on capacity, distance traveled and based on construction.– Bus body lay out for various types, Types of metal sections used – Regulations – Constructional details: Conventional and integral. driver seat design- Safety aspect of bus body.

UNIT III COMMERCIAL VEHICLE DETAILS **8**

Types of commercial vehicle bodies - Light commercial vehicle body. Construction details of commercial vehicle body - Flat platform body, Trailer, Tipper body and Tanker body – Dimensions of driver's seat in relation to controls – Drivers cab design - Regulations.

UNIT IV VEHICLE AERODYNAMICS **9**

Objectives, Vehicle drag and types. Various types of forces and moments. Effects of forces and moments. Side wind effects on forces and moments. Various body optimization techniques for minimum drag. Wind tunnels – Principle of operation, Types. Wind tunnel testing such as: Flow visualization techniques, Airflow management test – measurement of various forces and moments by using wind tunnel.

UNIT V BODY MATERIALS, TRIM, MECHANISMS AND BODY REPAIR **9**

Types of materials used in body construction-Steel sheet, timber, plastics, GRP, properties of materials. Body trim items-body mechanisms.Hand tools-power tools-panel repair-repairing sheet metal-repairing plastics-body fillers-passenger compartment service- corrosion: Anticorrosion methods, Modern painting process procedure-paint problems

TOTAL : 45 PERIODS

OUTCOMES

Upon completion of the course, students will

- Know about different aspects of car body and bus body, types, commercial vehicle.
- Role of various aerodynamic forces and moments, measuring instruments
- Know about the material used in body building, tools used, body repairs.

TEXT BOOKS:

1. James E Duffy, "Body Repair Technology for 4-Wheelers", Cengage Learning, 2009.
2. Powloski, J., "Vehicle Body Engineering", Business Books Ltd., 1998.

REFERENCES:

1. Braithwaite, J.B., "Vehicle Body building and drawing", Heinemann Educational Books Ltd., London, 1997.
2. Dieler Anselm., The passenger car body, SAE International, 2000
3. Giles, G.J., "Body construction and design", Illiffe Books Butterworth & Co., 1991.
4. John Fenton, "Vehicle Body layout and analysis", Mechanical Engg. Publication Ltd., London, 1992.

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AT8004 **NEW GENERATION AND HYBRID VEHICLES** **L T P C**
3 0 0 3

OBJECTIVE:

- To illustrate the new generation vehicles and their operation and controls

UNIT I INTRODUCTION **7**

Electric and hybrid vehicles, flexible fuel vehicles (FFV), solar powered vehicles, vehicles, fuel cells vehicles.

UNIT II POWER SYSTEM AND NEW GENERATION VEHICLES **12**

Hybrid Vehicle engines, Stratified charge engines, learn burn engines, low heat rejection engines, hydrogen engines, HCCI engine, VCR engine, surface ignition engines, VVTI engines. High energy and power density batteries, fuel cells, flexible fuel systems.

UNIT III VEHICLE OPERATION AND CONTROL **9**

Computer Control for pollution and noise control and for fuel economy – Transducers and actuators - Information technology for receiving proper information and operation of the vehicle like optimum speed and direction.

UNIT IV VEHICLE AUTOMATED TRACKS **9**

Preparation and maintenance of proper road network - National highway network with automated roads and vehicles - Satellite control of vehicle operation for safe and fast travel, GPS.

UNIT V SUSPENSION, BRAKES, AERODYNAMICS AND SAFETY **8**

Air suspension – Closed loop suspension, compensated suspension, anti skid braking system, retarders, regenerative braking, safety gauge air bags- crash resistance. Aerodynamics for modern vehicles, safety systems, materials and standards.

TOTAL: 45 PERIODS

OUTCOME:

- Upon completion of this course the student will familiar in the recent development pertain to energy system, vehicle operation, newer vehicle, recent technologies in the area of suspension systems, brakes, aerodynamics etc

TEXT BOOKS:

1. Bosch Hand Book, SAE Publication, 2000
2. Heinz, "Modern Vehicle Technology" Second Edition

REFERENCES:

1. Advance hybrid vehicle power transmission, SAE.
2. Light weight electric for hybrid vehicle design.
3. Noise reduction, Branek L.L., McGraw Hill Book company, New York, 1993.

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FABRICATION OF ANTI-THEFT WHEEL LOCKING SYSTEM

A PROJECT REPORT

Submitted by

ARUN BOOPATHI M (731218102001)

In partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

IN

AUTOMOBILE ENGINEERING

J.K.K. MUNIRAJAH COLLEGE OF TECHNOLOGY

T.N. PALAYAM-638506

ANNA UNIVERSITY: CHENNAI 600025

JUNE 2022

PRINCIPAL
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GOBI (Tk), ERODE (Dt).

ANNA UNIVERSITY: CHENNAI 600025

BONAFIDE CERTIFICATE

Certified that this report titled " **FABRICATION OF ANTI-THEFT WHEEL LOCKING SYSTEM** " is the Bonafide work of **ARUN BOOPATHI M (731218102001)** who carried out the work under my supervision. Certified further that to the best of my knowledge and the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

SIGNATURE	**SIGNATURE**
Mr. V. MAGESH., M.E.,	**Mr. S. GANESH KUMAR., M.E.,**
HEAD OF THE DEPARTMENT	**SUPERVISOR**
Assistant professor	Assistant professor
Dept of Automobile Engineering	Dept of Automobile Engineering
JKK Munirajah College of Technology	JKK Munirajah College of Technology
T.N. Palayam	T.N. Palayam

Submitted for the Viva- Voice examination held on 22-06-2022

Internal Examiner **External Examiner**

PRINCIPAL
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ABSTRACT

The aim of this project is to hinder the theft of bikes with the help of a wheel locking system. The solenoid switch is used as the main tool to lock the rear wheel of the bike. Solenoid is a device that monitors in linear motion. It includes plunger which moves in too and for motion and is connected to the battery supply. The brake lever in disc brake system enables the functions of disc brake. The plan is about to activate the disc brake functions while the ignition key is kept in OFF stage. Hence the program manages the solenoid actions.

Keywords: GPS, TWVSS (Two-wheeler vehicle security), SMS, GSM, Push Pull Solenoid.

CHAPTER 9

CONCLUSION

The anti-theft wheel locking system is a breakthrough in today's world where automobile theft has increased rapidly. Today, majority of the communication and its applications are used by using GSM. The combination of GSM in anti-theft wheel locking system ensures efficiency and security as is required by it. The GSM also ensures that the effectiveness of the system is not just restricted to local use but can be covered over a wide range. With smartphones proliferating, it will become possible to disable the automobile remotely. This can deter thefts unless the software gets hacked or disabled. And such systems can take over the car-alarms used usually nowadays. Presently, only the SMS feature is available. For ease of operation, developments can be made to include the Call Feature. Microprocessor can also be interfaced to the GMS module so that during theft activity, SMS could be established with the owner.

INTERNSHIP

Gmail

Internship
1message

MON 11 APR 2022 at 2.30pm

From: MAGESHV<hodauto@jkkmct.edu.in>
Date: MON 11 APR 2022 at 2.30pm
Subject:Internship -reg
To:SAKTHIGEARS<hr@sakthigear.com>

Dear **Sir,**

I am requesting to be joining your **SAKTHI GEAR PRODUCTS.**The requirements are exactly what I have prepared for and hoped to do. I feel confident that I can make a significant contribution to your organization while at the same time learning from your staff.

Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe your outstanding staff.

Refer the following student:**(ARUN BOOPATHI.M)**

Sincerely,

Final Year Auto Student,
J K KMunirajah College of Technology,
T.N.Palayam,Erode-638506,Tamilnadu.

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JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Gmail

Internship
1message

WED 13 APR 2022 at 3.30pm

From: SAKTHIGEARS< hr@sakthigear.com >
Date: WED 13 APR 2022 at 3.30pm

Subject:Internship-reg

To:MAGESHV<hodauto@jkkmct.edu.in>

Dear **Sir,**

I am writing to confirm my acceptance of your internship offer of 16.4.2022 TO 30.5.2022 and to tell you how to be joining my **SAKTHI GEAR PRODUCTS.** The requirements are exactly what I have prepared for and hoped to do.I feel confident that I can make a significant contribution to your organization while at the same time learning from my staff.

Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe my outstanding staff.

Refer the following student:**(ARUN BOOPATHI.M)**

Sincerely,

HR Manager,
Sakthi Gear Products,
Coimbatore.

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GOBI (Tk), ERODE (Dt).

SAKTHI GEAR PRODUCTS

INTERNSHIP CERTIFICATE

TO WHOM-SO-EVER IT MAY CONCERN

This is to certify that Mr .ARUNBOOPATHI. M, IV Year student B.E.Automobile Engineering,J.K.K.Munirajah College of Technology, T.N.Palayam has successfully completed 45 days (16.04.2022 to 30.05.2022) internship in " SAKTHI GEAR PRODUCTS PRIVATE LIMITED COIMBATORE. "

He has worked on project titled " FABRICATION OF ANTI-THEFT WHEEL LOCKING SYSTEM " This project aimed to hinder the theft of bikes with the help of a wheel locking system.

During this tenure Mr.ARUNBOOPATHI.M has involved in his work with dedication. We found him pretty and active in whatever the task we have given him. He is a confident person, punctual, hardworking and inqulsitive.

His conduct and character was good during the internship period.

Coimbatore
30.05.2022

SAKTHI GEAR PRODUCTS Coimbatore

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GOBI (Tk), ERODE (Dt).

General Manager

Internel Guide

7/4, School Street, Chinnavedampatti Post, Ganapathy,Coimbatore 641006, Tamil Nadu, India.Website: www.sakthigear.com, Mail ID: sales@sakthigear.com, Land line :0422-2364100

PROJECT

AT8811 **PROJECT WORK** L T P C
0 0 20 10

OBJECTIVE:

- To develop the ability to solve a specific problem right from its identification and literature review till the successful solution of the same. To train the students in preparing project reports and to face reviews and viva voce examination.

The students in a group of 3 to 4 works on a topic approved by the head of the department under the guidance of a faculty member and prepares a comprehensive project report after completing the work to the satisfaction of the supervisor. The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The project work is evaluated based on oral presentation and the project report jointly by external and internal examiners constituted by the Head of the Department.

TOTAL: 300 PERIODS

OUTCOME:

- On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.

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AT8004 **NEW GENERATION AND HYBRID VEHICLES** L T P C
3 0 0 3

OBJECTIVE:

- To illustrate the new generation vehicles and their operation and controls

UNIT I INTRODUCTION 7

Electric and hybrid vehicles, flexible fuel vehicles (FFV), solar powered vehicles, vehicles, fuel cells vehicles.

UNIT II POWER SYSTEM AND NEW GENERATION VEHICLES 12

Hybrid Vehicle engines, Stratified charge engines, learn burn engines, low heat rejection engines, hydrogen engines, HCCI engine, VCR engine, surface ignition engines, VVTI engines. High energy and power density batteries, fuel cells, flexible fuel systems.

UNIT III VEHICLE OPERATION AND CONTROL 9

Computer Control for pollution and noise control and for fuel economy – Transducers and actuators - Information technology for receiving proper information and operation of the vehicle like optimum speed and direction.

UNIT IV VEHICLE AUTOMATED TRACKS 9

Preparation and maintenance of proper road network - National highway network with automated roads and vehicles - Satellite control of vehicle operation for safe and fast travel, GPS.

UNIT V SUSPENSION, BRAKES, AERODYNAMICS AND SAFETY 8

Air suspension – Closed loop suspension, compensated suspension, anti skid braking system, retarders, regenerative braking, safety gauge air bags- crash resistance. Aerodynamics for modern vehicles, safety systems, materials and standards.

TOTAL: 45 PERIODS

OUTCOME:

- Upon completion of this course the student will familiar in the recent development pertain to energy system, vehicle operation, newer vehicle, recent technologies in the area of suspension systems, brakes, aerodynamics etc

TEXT BOOKS:

1. Bosch Hand Book, SAE Publication, 2000
2. Heinz, "Modern Vehicle Technology" Second Edition

REFERENCES:

1. Advance hybrid vehicle power transmission, SAE.
2. Light weight electric for hybrid vehicle design.
3. Noise reduction, Branek L.L., McGraw Hill Book company, New York, 1993.

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AT8402 **AUTOMOTIVE CHASSIS** L T P C
3 0 0 3

OBJECTIVE:

- Study of the Constructional details and Theory of important drive line, Structural, Steering, Braking and Suspension Systems of Automobiles. Problem–Solving in Steering Mechanism, Propeller Shaft, Braking and Suspension Systems are to be done.

UNIT I LAYOUT, FRAME, FRONT AXLE AND STEERING SYSTEM 9

Basic construction of chassis, Types of Chassis layout, with reference to Power Plant location and drive, various, types of frames, Loads acting on vehicle frame, Types of Front Axles and Stub Axles, Front Wheel Geometry. Condition for True Rolling Motion. Ackerman's and Davi's Steering Mechanisms, Steering Linkages, Different Types of Steering Gear boxes, Slip Angle, Over–Steer and Under–Steer, Reversible and Irreversible Steering, Power Steering.

UNIT II DRIVE LINE, FINAL DRIVE AND DIFFERENTIAL 9

Driving Thrust and its effects, torque reactions and side thrust, Hotchkiss drive, torque tube drive, radius rods and stabilizers, Propeller Shaft, Universal Joints, Constant Velocity Universal Joints, Final drive, different types of final drive, Worm and Worm wheel, straight bevel gear, spiral bevel gear and hypoid gear final drive. Differential principle. Constructional details of differential unit, Differential housings, Non–Slip differential, Differential locks.

UNIT III REAR AXLES, WHEELS, RIMS AND TYRES 9

Construction of rear axles, Types of Loads acting on rear axles, Full –Floating, Three–Quarter Floating and Semi–Floating Axles, Twist beam rear axle, Types, Multi axles vehicles. Wheels and Rims, Types of Tyres and their constructional details.

UNIT IV SUSPENSION SYSTEM 9

Requirement of Suspension System, Types of Suspension Springs, Constructional details and characteristics of Single Leaf, Multi–Leaf spring, Coil and Torsion bar Springs, Rubber, Pneumatic and Hydro – elastic Suspension Spring Systems, Independent Suspension System, Shock Absorbers, Types and Constructional details of Leaf and Coil Springs.

UNIT V BRAKE SYSTEMS 9

Need for Brake systems, Stopping Distance, Time and Braking Efficiency, Effect of Weight Transfer during Braking, Classification of brakes , Braking Torque, drum brake and disc Brake Theory, Types and Construction of Hydraulic Braking System, Mechanical Braking System, Pneumatic Braking System, Power–Assisted Braking System, Servo Brakes, Retarders – antilock braking systems(ABS).

TOTAL : 45 PERIODS

OUTCOME:

- The students will understand the constructional, working principle of various sub system of an automobile.

TEXT BOOKS

1. Newton Steeds and Garret, "Motor Vehicles" 13th Edition, Butterworth, London, 2005.
2. Heinz Hazler, "Modern Vehicle Technology", Butterworth, London, 2005.
3. Devaradjane. Dr. G., Dr. M. Kumaresan, "Automobile Engineering", AMK Publishers, 2013.

REFERENCES

1. Heldt P.M., "Automotive Chassis" Chilton Co., New York, 1990
2. Giri. N.K., "Automotive Mechanics" Khanna Publishers, New Delhi, 2005.
3. Milliken & Milliken, "Race Car Vehicle Dynamics", SAE, 1995

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ME8593 **DESIGN OF MACHINE ELEMENTS** **L T P C**
3 0 0 3

OBJECTIVES

- To familiarize the various steps involved in the Design Process
- To understand the principles involved in evaluating the shape and dimensions of a component to satisfy functional and strength requirements.
- To learn to use standard practices and standard data
- To learn to use catalogues and standard machine components
  (Use of P S G Design Data Book is permitted)

UNIT I STEADY STRESSES AND VARIABLE STRESSES IN MACHINE MEMBERS 9

Introduction to the design process - factors influencing machine design, selection of materials based on mechanical properties - Preferred numbers, fits and tolerances – Direct, Bending and torsional stress equations – Impact and shock loading – calculation of principle stresses for various load combinations, eccentric loading – curved beams – crane hook and 'C' frame- Factor of safety - theories of failure – Design based on strength and stiffness – stress concentration – Design for variable loading.

UNIT II SHAFTS AND COUPLINGS 9

Design of solid and hollow shafts based on strength, rigidity and critical speed – Keys, keyways and splines - Rigid and flexible couplings.

UNIT III TEMPORARY AND PERMANENT JOINTS 9

Threaded fastners - Bolted joints including eccentric loading, Knuckle joints, Cotter joints – Welded joints, riveted joints for structures - theory of bonded joints.

UNIT IV ENERGY STORING ELEMENTS AND ENGINE COMPONENTS 9 Various types of springs, optimization of helical springs - rubber springs - Flywheels considering stresses in rims and arms for engines and punching machines- Connecting Rods and crank shafts.

UNIT V BEARINGS 9

Sliding contact and rolling contact bearings - Hydrodynamic journal bearings, Sommerfeld Number, Raimondi and Boyd graphs, -- Selection of Rolling Contact bearings.

TOTAL: 45 PERIODS

OUTCOMES:

Upon the completion of this course the students will be able to

CO1 Explain the influence of steady and variable stresses in machine component design.
CO2 Apply the concepts of design to shafts, keys and couplings.
CO3 Apply the concepts of design to temporary and permanent joints.
CO4 Apply the concepts of design to energy absorbing members, bearings and connecting rod.
CO5 Apply the concepts of design to bearings.

TEXT BOOKS:

1. Bhandari V, "Design of Machine Elements", 4th Edition, Tata McGraw-Hill Book Co, 2016.
2. Joseph Shigley, Charles Mischke, Richard Budynas and Keith Nisbett "Mechanical Engineering Design", 9th Edition, Tata McGraw-Hill, 2011.

REFERENCES:

3. Alfred Hall, Halowenko, A and Laughlin, H., "Machine Design", Tata McGraw-Hill BookCo.(Schaum's Outline), 2010
4. Ansel Ugural, "Mechanical Design – An Integral Approach", 1st Edition, Tata McGraw-Hill Book Co, 2003.
5. P.C. Gope, "Machine Design – Fundamental and Application", PHI learning private ltd, New Delhi, 2012.
6. R.B. Patel, "Design of Machine Elements", MacMillan Publishers India P Ltd., Tech-Max Educational resources, 2011.

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AT8801 **VEHICLE BODY ENGINEERING** L T P C 3 0 0 3

OBJECTIVE:

- The main objective of this course is to impart knowledge in the construction of vehicle, aerodynamic, concept, paneling of passenger car body trim. At the end of the course the student will be well versed in the design and construction of external body of the vehicles.

UNIT I CAR BODY DETAILS 10

Types of Car body - Saloon, convertibles, Limousine, Estate Van, Racing and Sports car – Visibility-regulations, driver's visibility, improvement in visibility and tests for visibility. Driver seat design -Car body construction-Various panels in car bodies. Safety aspect of car body.

UNIT II BUS BODY DETAILS 9

Types of bus body: based on capacity, distance traveled and based on construction.– Bus body lay out for various types, Types of metal sections used – Regulations – Constructional details: Conventional and integral. driver seat design- Safety aspect of bus body.

UNIT III COMMERCIAL VEHICLE DETAILS 8

Types of commercial vehicle bodies - Light commercial vehicle body. Construction details of commercial vehicle body - Flat platform body, Trailer, Tipper body and Tanker body – Dimensions of driver's seat in relation to controls – Drivers cab design - Regulations.

UNIT IV VEHICLE AERODYNAMICS 9

Objectives, Vehicle drag and types. Various types of forces and moments. Effects of forces and moments. Side wind effects on forces and moments. Various body optimization techniques for minimum drag. Wind tunnels – Principle of operation, Types. Wind tunnel testing such as: Flow visualization techniques, Airflow management test – measurement of various forces and moments by using wind tunnel.

UNIT V BODY MATERIALS, TRIM, MECHANISMS AND BODY REPAIR 9

Types of materials used in body construction-Steel sheet, timber, plastics, GRP, properties of materials. Body trim items-body mechanisms.Hand tools-power tools-panel repair-repairing sheet metal-repairing plastics-body fillers-passenger compartment service- corrosion: Anticorrosion methods, Modern painting process procedure-paint problems

TOTAL : 45 PERIODS

OUTCOMES

Upon completion of the course, students will

- Know about different aspects of car body and bus body, types, commercial vehicle.
- Role of various aerodynamic forces and moments, measuring instruments
- Know about the material used in body building, tools used, body repairs.

TEXT BOOKS:

1. James E Duffy, "Body Repair Technology for 4-Wheelers", Cengage Learning, 2009.
2. Powloski, J., "Vehicle Body Engineering", Business Books Ltd., 1998.

REFERENCES:

1. Braithwaite, J.B., "Vehicle Body building and drawing", Heinemann Educational Books Ltd., London, 1997.
2. Dieler Anselm., The passenger car body, SAE International, 2000
3. Giles, G.J., "Body construction and design", Illiffe Books Butterworth & Co., 1991.
4. John Fenton, "Vehicle Body layout and analysis", Mechanical Engg. Publication Ltd., London, 1992.

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

DESIGN AND FABRICATION OF THREE AXIS HYDRAULIC MODERN TRAILER

A PROJECT REPORT

Submitted by

LOGU P (731218102003)

in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

in

AUTOMOBILE ENGINEERING

J.K.K MUNIRAJAH COLLEGE OF TECHNOLOGY

T.N. PALAYAM, GOBI-638 506.

ANNA UNIVERSITY: CHENNAI 600025

JUNE 2022

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

ANNA UNIVERSITY:CHENNAI 600025

BONAFIDE CERTIFICATE

Certified that this Report titled **"DESIGN AND FABRICATION OF THREE AXIS HYDRAULIC MODERN TRAILER"** is the bonafide work of **LOGU P (731218102003)** who carried out the work under my supervision. Certified further that to the best of my knowledge and the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

SIGNATURE

Mr.V.MAGESH.,M.E.,

HEAD OF THE DEPARTMENT

Assistant Professor

Dept of Automobile Engineering

JKK Munirajah College of Technology

T.N.Palayam

SIGNATURE

Mr.S.GANESH KUMAR.,M.E.,

SUPERVISOR

Assistant Professor

Dept of Automobile Engineering

JKK Munirajah College of Technology

T.N.Palayam

Submitted for the Viva-Voce examination held on 22-06-2022

Internal Examiner

External Examiner

PRINCIPAL
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GOBI (Tk), ERODE (Dt).

ABSTRACT

This project is generally an unpowered vehicle pulled by a powered vehicle. Commonly, the term trailer refers to such vehicles used for transport of goods and materials. Sometimes recreational vehicles, travel trailers, or mobile homes with limited living facilities where people can camp or stay have been referred to as trailers. A Trailer is generally an unpowered vehicle pulled by a powered vehicle. Commonly, the term trailer refers to such vehicles used for transport of goods and materials. Sometimes recreational vehicles, travel trailers, or mobile homes with limited living facilities where people can camp or stay have been referred to as trailers. In earlier days, many such vehicles were towable trailers. Automation can be achieved through computers, hydraulics, robotics, etc., of these sources, hydraulics form an attractive medium. Automation plays an important role in automobile. Nowadays almost all the automobile vehicle is being atomized in order to product the human being.

Key Words: Double acting, Hydraulic cylinder Solenoid vale, Flow control valve, Connectors, Hoses, Motor, control unit.

CHAPTER 9

CONCLUSION

This project is made with pre planning, that it provides flexibility in operation.This innovation has made the more desirable and economical. This project "THREE AXIS HYDRAULIC MODERN TRAILER" is designed with the hope that it is very much economical and help full to auto garages, etc,...

This project helped us to know the periodic steps in completing a project work. Thus we have completed the project successfully.

This paper will review the need of the modern three axis hydraulic trailer for the ship to perform the operation of lifting heavy weight materials. This paper also studies the importance of hydraulic circuit system and its application in shipping industry. Various parts of the modern three axis hydraulic trailer was studied and their performance was analyzed in terms of the work. Further review is made on the practical plastic model of project with analysis of working and with the help of hydraulic system lifting operations can be easily carried out without much effort and without outsourcing. This mechanism cannot only applicable in the shipping industry but also it is applicable for various manufacturing industries.

The operating procedure of this system is very simple, so any person can operate. By using more techniques, they can be modified and developed according to the applications.

INTERNSHIP

Gmail

Internship
1message

FRI 08 APR 2022 at 2.00pm

From: MAGESHV<hodauto@jkkmct.edu.in>
Date: FRI 08 APR 2022 at 2.00pm
Subject:Internship -reg
To:PERIYASAMYHUDRAULIC<hr@periyasamyhydraulic.com >

Dear **Sir,**

I am requesting to be joining your **PERIYASAMY HUDRAULICS EQUIPMENTS.** The requirements are exactly what I have prepared for and hoped to do. I feel confident that I can make a significant contribution to your organization while at the same time learning from your staff.

Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe your outstanding staff.

Refer the following student:**(LOGU.P)**

Sincerely,

Final Year Auto Student,
J K KMunirajah College of Technology,
T.N.Palayam,Erode-638506,Tamilnadu.

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Gmail

Internship
1message

MON 11 APR 2022 at 3.40pm

From: PERIYASAMYHUDRAULIC< hr@periyasamyhydraulic.com >
Date: MON 11 APR 2022 at 3.40pm

Subject:Internship-reg

To:MAGESHV<hodauto@jkkmct.edu.in>

Dear **Sir,**

I am writing to confirm my acceptance of your internship offer of 14.4.2022 TO 28.5.2022 and to tell you how to be joining my **PERIYASAMY HYDRAULIC EQUIPMENTS.**

Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. So kindly make necessary arrangements for the same and also inform to your student must come with proper dress code and must follow company rules and regulations without fail.

Refer the following student:**(LOGU.P)**

Sincerely,

HR Manager,
Periyasamy Hydraulic Equipments,
Tirupur.

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506,
GOBI (Tk), ERODE (Dt).

PHE
PERIYASAMY HYDRAULIC EQUIPMENTS

Makers of Green India

INTERNSHIP CERTIFICATE

This is to certify that Mr.LOGU.P, Final year student B.E. Automobile Engineering at J.K.K. Munirajah College of Technology, T.N.palayam, Gobi(TK), Erode District-638 506 had undergone the internship program at "Periyasamy Hydraulic Equipments during 14.04.2022 to 28.05.2022.

We wish him all the best in his future endeavor.

Tirupur
29.05.2022

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Periyasamy Hydraulic Equipments (PHE)
24/A1, PN Rd, Kunnathur,
Tiruppur-638 103.
AUTHORIZED SIGN

PROJECT

AT8811 **PROJECT WORK** L T P C
0 0 20 10

OBJECTIVE:

- To develop the ability to solve a specific problem right from its identification and literature review till the successful solution of the same. To train the students in preparing project reports and to face reviews and viva voce examination.

The students in a group of 3 to 4 works on a topic approved by the head of the department under the guidance of a faculty member and prepares a comprehensive project report after completing the work to the satisfaction of the supervisor. The progress of the project is evaluated based on a minimum of three reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The project work is evaluated based on oral presentation and the project report jointly by external and internal examiners constituted by the Head of the Department.

TOTAL: 300 PERIODS

OUTCOME:

- On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.

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AT8004 **NEW GENERATION AND HYBRID VEHICLES** L T P C
3 0 0 3

OBJECTIVE:

- To illustrate the new generation vehicles and their operation and controls

UNIT I INTRODUCTION 7

Electric and hybrid vehicles, flexible fuel vehicles (FFV), solar powered vehicles, vehicles, fuel cells vehicles.

UNIT II POWER SYSTEM AND NEW GENERATION VEHICLES 12

Hybrid Vehicle engines, Stratified charge engines, learn burn engines, low heat rejection engines, hydrogen engines, HCCI engine, VCR engine, surface ignition engines, VVTI engines. High energy and power density batteries, fuel cells, flexible fuel systems.

UNIT III VEHICLE OPERATION AND CONTROL 9

Computer Control for pollution and noise control and for fuel economy – Transducers and actuators - Information technology for receiving proper information and operation of the vehicle like optimum speed and direction.

UNIT IV VEHICLE AUTOMATED TRACKS 9

Preparation and maintenance of proper road network - National highway network with automated roads and vehicles - Satellite control of vehicle operation for safe and fast travel, GPS.

UNIT V SUSPENSION, BRAKES, AERODYNAMICS AND SAFETY 8

Air suspension – Closed loop suspension, compensated suspension, anti skid braking system, retarders, regenerative braking, safety gauge air bags- crash resistance. Aerodynamics for modern vehicles, safety systems, materials and standards.

TOTAL: 45 PERIODS

OUTCOME:

- Upon completion of this course the student will familiar in the recent development pertain to energy system, vehicle operation, newer vehicle, recent technologies in the area of suspension systems, brakes, aerodynamics etc

TEXT BOOKS:

1. Bosch Hand Book, SAE Publication, 2000
2. Heinz, "Modern Vehicle Technology" Second Edition

REFERENCES:

1. Advance hybrid vehicle power transmission, SAE.
2. Light weight electric for hybrid vehicle design.
3. Noise reduction, Branek L.L., McGraw Hill Book company, New York, 1993.

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AT8801 **VEHICLE BODY ENGINEERING** L T P C 3 0 0 3

OBJECTIVE:

- The main objective of this course is to impart knowledge in the construction of vehicle, aerodynamic, concept, paneling of passenger car body trim. At the end of the course the student will be well versed in the design and construction of external body of the vehicles.

UNIT I CAR BODY DETAILS **10**

Types of Car body - Saloon, convertibles, Limousine, Estate Van, Racing and Sports car – Visibility-regulations, driver's visibility, improvement in visibility and tests for visibility. Driver seat design -Car body construction-Various panels in car bodies. Safety aspect of car body.

UNIT II BUS BODY DETAILS **9**

Types of bus body: based on capacity, distance traveled and based on construction.– Bus body lay out for various types, Types of metal sections used – Regulations – Constructional details: Conventional and integral. driver seat design- Safety aspect of bus body.

UNIT III COMMERCIAL VEHICLE DETAILS **8**

Types of commercial vehicle bodies - Light commercial vehicle body. Construction details of commercial vehicle body - Flat platform body, Trailer, Tipper body and Tanker body – Dimensions of driver's seat in relation to controls – Drivers cab design - Regulations.

UNIT IV VEHICLE AERODYNAMICS **9**

Objectives, Vehicle drag and types. Various types of forces and moments. Effects of forces and moments. Side wind effects on forces and moments. Various body optimization techniques for minimum drag. Wind tunnels – Principle of operation, Types. Wind tunnel testing such as: Flow visualization techniques, Airflow management test – measurement of various forces and moments by using wind tunnel.

UNIT V BODY MATERIALS, TRIM, MECHANISMS AND BODY REPAIR **9**

Types of materials used in body construction-Steel sheet, timber, plastics, GRP, properties of materials. Body trim items-body mechanisms.Hand tools-power tools-panel repair-repairing sheet metal-repairing plastics-body fillers-passenger compartment service- corrosion: Anticorrosion methods, Modern painting process procedure-paint problems

TOTAL : 45 PERIODS

OUTCOMES

Upon completion of the course, students will

- Know about different aspects of car body and bus body, types, commercial vehicle.
- Role of various aerodynamic forces and moments, measuring instruments
- Know about the material used in body building, tools used, body repairs.

TEXT BOOKS:

1. James E Duffy, "Body Repair Technology for 4-Wheelers", Cengage Learning, 2009.
2. Powloski, J., "Vehicle Body Engineering", Business Books Ltd., 1998.

REFERENCES:

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4. John Fenton, "Vehicle Body layout and analysis", Mechanical Engg. Publication Ltd., London, 1992.

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GOBI (Tk), ERODE (Dt).

FABRICATION OF NEXT GENERATION AIR CAR USING COMPRESEED AIR

A PROJECT REPORT

Submitted by

MOHAMMED RIYAZ KHAN M (731218102004)

In partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

in

AUTOMOBILE ENGINEERING

J.K.K. MUNIRAJAH COLLEGE OF TECHNOLOGY

T.N. PALAYAM-638506

ANNA UNIVERSITY: CHENNAI 600025

JUNE 2022

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

ANNA UNIVERSITY: CHENNAI 600025

BONAFIDE CERTIFICATE

Certified that this report titled " **FABRICATION OF NEXT GENERATION AIR CAR USING COMPRESSED AIR** " is the bonafide work of **MOHAMMED RIYAZ KHAN M (731218102004)** who carried out the work under my supervision. Certified further that to the best of my knowledge and the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

SIGNATURE

Mr. V. MAGESH., M.E.,

HEAD OF THE DEPARTMENT

Assistant professor
Dept of Automobile Engineering
JKK Munirajah College of Technology
T.N. Palayam-638506

SIGNATURE

Mr. S. GANESH KUMAR., ME.,

SUPERVISOR

Assistant professor
Dept of Automobile Engineering
JKK Munirajah College of Technology
T.N. Palayam-638506

Submitted for the Viva- Voice examination held on 22-06-2022.

Internal Examiner

External Examiner

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

ABSTRACT

Compressed air as a source of energy in different uses in general and as a nonpolluting fuel in compressed air vehicles has attracted scientists and engineers for centuries. Efforts are being made by many developers and manufacturers to master the compressed air vehicle technology in all respects for its earliest use by the mankind. The present paper gives a brief description of how a compressed air vehicle using this technology was made. While developing of this vehicle, control of compressed air parameters like temperature, energy density, requirement of input power, energy release and emission control have to be mastered for the development of a safe, light and cost-effective compressed air.

keywords: Compressed Air, Emission Control, Pneumatic Cylinder, Non- Fuel Pollution.

CHAPTER 9
CONCLUSION

This project work has provided us an excellent opportunity and experience, to use our limited knowledge. We gained a lot of practical knowledge regarding, planning, purchasing, assembling and machining while doing this project work. We feel that the project work is a good solution to bridge the gates between the institution and the industries.

We are proud that we have completed the work with the limited time successfully. The FABRICATION OF COMPRESSED AIR VEHICLE is working with satisfactory conditions. We can able to understand the difficulties in maintaining the tolerances and also the quality. We have done to our ability and skill making maximum use of available facilities.

In conclusion remarks of our project work, let us add a few more lines about our impression project work. Thus, we have developed a "COMPRESSED AIR VEHICLE.

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T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

INTERNSHIP

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Gmail

Internship
1 message

MON 11 APR 2022 at 4.30pm

From: MAGESHV<hodauto@jkkmct.edu.in>
Date: MON 11 APR 2022 at 4.30pm
Subject:Internship -reg
To: SHENDHUR ALLOYS FOUNDRY <hr@shendhuralloys.com >

Dear Sir,

I am requesting to be joining your **SHENDHUR ALLOYS FOUNDRY**. The requirements are exactly what I have prepared for and hoped to do. I feel confident that I can make a significant contribution to your organization while at the same time learning from your staff.

Additionally, I shall complete all insurance forms for the new intern orientation. I look forward to working with you and your fine team. I appreciate your confidence in me and providing the chance to work with and observe your outstanding staff.

Refer the following student:**(MOHAMMED RIYAZKHAN.M)**

Sincerely,

Final Year Auto Student,
J K KMunirajah College of Technology,
T.N.Palayam,Erode-638506,Tamilnadu.

PRINCIPAL
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OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Gmail

Internship
1message

WED 13 APR 2022 at 5.30pm

From: SHENDHUR ALLOYS FOUNDRY <hr@shendhuralloys.com >

Date: WED 13 APR 2022 at 5.30pm

Subject:Internship-reg

To:MAGESHV<hodauto@jkkmct.edu.in>

Dear Sir,

I am writing to confirm my acceptance of your internship offer of 16.4.2022 TO 30.5.2022 and to tell you how to be joining my **SHENDHUR ALLOYS FOUNDRY.** So kindly make necessary arrangements for the same and also inform to your student must come with neat dress code and must follow company rules and regulations without fail.

Refer the following student:**(MOHAMMED RIYAZKHAN.M)**

Sincerely,

HR Manager,
Shendhur Alloys Foundry,
Coimbatore.

PRINCIPAL
JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

SHENDHUR ALLOYS FOUNDRY

INTERNSHIP CERTIFICATE

TO WHOM-SO-EVER IT MAY CONCERN

This is so certify that Mr .MOHAMMED RIYAZ KHAN.M, IV Year student B.E.Automobile Engineering, J.K.K. Munirajah College of Technology, T.N.Palayam has successfully completed 45 days (16.04.2022 to 30.05.2022) internship in " SHENDHUR ALLOYS FOUNDRY COIMBATORE. "

He has worked on project titled " FABRICATION OF NEXT GENERATION AIR CAR USING COMPRESSED AIR" This project aimed to decreasing the fuel usage and another fuel resourse usage.

During his stay in the company as an intern, he display enthusiasm, leadership, self-discipline , and self-motivation.

we would like to wish him/her all the best.

PRINCIPAL
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OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

Shendhur Alloys Foundry Coimbatore

Authorized signatory

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...Mail ID:sendhuralloys@gmail.com, Land Line :.0422-547862,.0422-547741..