

DESIGN AND FABRICATION OF STEERING SYSTEM FOR GO - KART

APROJECTREPORT

Submitted by

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In partial fulfillment for the award of the degree

of

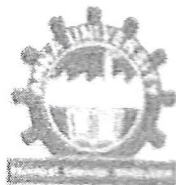
BACHELOR OF ENGINEERING

in

MECHANICAL ENGINEERING



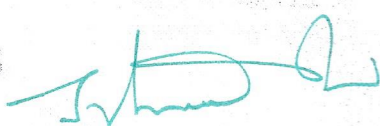
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ANNA UNIVERSITY:CHENNAI 600025

JUNE 2022

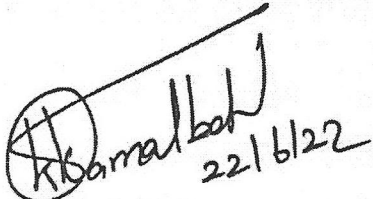



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BONAFIDE CERTIFICATE

Certified that this project report "DESIGN AND FABRICATION OF STEERING SYSTEM FOR GO - KART" is the bonafide work of "LOGANATHAN C (112819114012), PATNAM HEMANTH KUMAR (112819114015), AVINASH S (112819114019), VIJI R (112819114024)", who carried out the project work under my supervision.


22/6/22

SIGNATURE

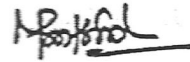
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SIGNATURE

Mr. M. PRAKASH, M.E.,

SUPERVISOR

ASSISTANT PROFESSOR

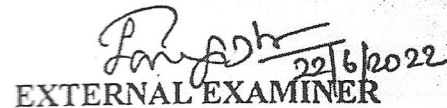
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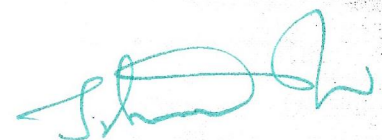
Submitted for project viva-voce examination held on 22/6/22 -


22/6/22

INTERNAL EXAMINER


22/6/2022

EXTERNAL EXAMINER



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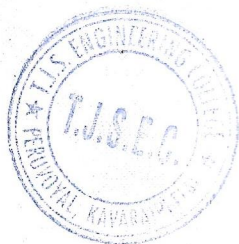
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ABSTRACT

- The objective of this project is to design and fabricate the steering system for electric go kart. Usually, majority of the go kart available at the market are based on petrol engine. The functional for this steering system are based on available product which is evaluated by research on the available source such as Internet. The basic part for the steering system such as steering column, track rods and stub axle are being research thoroughly to understand the function of each part. Before the fabrication process, some research for the milling, lathing, drilling and welding process are done to make sure it is suitable for the material used.

- To obtain the best designs, it has to be parallel with the scope of the project and suited with the criteria needed. Three concepts design are generated and final design are choose based on the Evaluation Table and discussion between team members and supervisor. Material selection is chose by surveying the available raw material from the store. Materials based on mild steel are choose due to its characteristic which can be weld and fabricate easily. Measuring, cutting, drilling, turning, milling, bending, welding, grinding and finishing process are done to complete this project. The final phase of this project is to assemble all the components and parts of the electric go kart fabricate from the team members. The purpose of this project is to allow the driver of go kart to change the direction during handling.



A handwritten signature in blue ink, appearing to be 'S. J. S.', written over the printed name of the Principal.

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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 fasteners - 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, connecting rod and crank shaft.
- CO5 Apply the concepts of design to bearings.

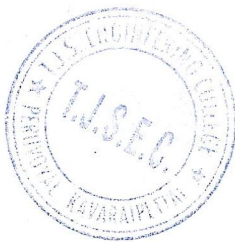
TEXT BOOKS:

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:

1. Alfred Hall, Halowenko, A and Laughlin, H., "Machine Design", Tata McGraw-Hill BookCo.(Schaum's Outline), 2010
2. Ansel Ugural, "Mechanical Design – An Integral Approach", 1st Edition, Tata McGraw-Hill Book Co, 2003.
3. P.C. Gope, "Machine Design – Fundamental and Application", PHI learning private ltd, New Delhi, 2012.
4. R.B. Patel, "Design of Machine Elements", MacMillan Publishers India P Ltd., Tech-Max Educational resources, 2011.
5. Robert C. Juvinall and Kurt M. Marshek, "Fundamentals of Machine Design", 4th Edition, Wiley, 2005
6. Sundararamoorthy T. V. Shanmugam .N, "Machine Design", Anuradha Publications, Chennai, 2015.



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