

# DESIGN AND FABRICATION OF BRAKING SYSTEM FOR GO – KART

APROJECTREPORT

*Submitted by*

JAYAKUMAR M (112819114009)

KISHORE KUMAR R (112819114010)

MOHANA PRASANTH M (112819114013)

SHEFTON JOSEPH (112819114020)

*In partial fulfillment for the award of the degree*

*of*

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*in*

**MECHANICAL ENGINEERING**



**T.J.S ENGINEERING COLLEGE**



**ANNA UNIVERSITY:CHENNAI 600025**

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**ANNA UNIVERSITY:CHENNAI 600 025**

**BONAFIDE CERTIFICATE**

Certified that this project report “**DESIGN AND FABRICATION OF BRAKING SYSTEM FOR GO - KART**” is the bonafide work of “**JAYAKUMAR M (112819114009), KISHORE KUMAR R (112819114010), MOHANA PRASANTH M (112819114013), SHEFTON JOSEPH (112819114020)**”, who carried out the project work under my supervision.



**SIGNATURE**

Dr. K. KAMAL BABU, Ph.D. (NIT-T)

**HEAD OF THE DEPARTMENT**

**PROFESSOR**

**MECHANICAL ENGINEERING**

**T.J.S ENGINEERING COLLEGE**



**SIGNATURE**

Mr.S.SATHYA MOORTHY, M.E.,

**SUPERVISOR**

**ASSISTANT PROFESSOR**

**MECHANICAL ENGINEERING**

**T.J.S ENGINEERING COLLEGE**

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**INTERNAL EXAMINER**



**EXTERNAL EXAMINER**

### **ABSTRACT:**

A Go Cart also spelled as Go Kart is a four wheeled vehicle designed and meant for racing only (though in some countries it is used for fun personal transportation). It is a small four wheeler run by I.C Engine. It is a miniature of a racing car. Go Cart is not a factory made product; it can be made by Automobile engineers.

This report documents the process and methodology to produce a low cost go-kart. Simple but innovative, we have made a simple, self-fabricated „Go Kart“, chassis formed by hollow rectangular bar, powered by Honda 150 cc engine fitted with dual disc brake. The chassis are made of steel tube. There is no suspension therefore chassis have to be flexible enough to work as a suspension and stiff enough not to break or give way on a turn.

We are replacing hollow tubular shaft with hollow rectangular shaft. The purposes of this replacement are; For the same length of tubular shaft, rectangular shaft weighs the same, for visual improvement, for better mounting ability and the main thing is, it is found that hollow rectangular shaft has more bending stress than the tubular shaft.

**KEY WORDS:** Go Cart, Racing Car, Bike Engine

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", 4<sup>th</sup> Edition, Tata McGraw-Hill Book Co, 2016.
2. Joseph Shigley, Charles Mischke, Richard Budynas and Keith Nisbett "Mechanical Engineering Design", 9<sup>th</sup> 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", 1<sup>st</sup> 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", 4<sup>th</sup> Edition, Wiley, 2005
6. Sundararajamoorthy T. V. Shanmugam .N, "Machine Design", Anuradha Publications, Chennai, 2015.