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Deen Dayal Upadhyay KAUSHAL Kendra
Organizes
07 days training workshop on

GO-KART DESIGN & DEVELOPMENT

04TH DEC-10TH DEC, 2017

20 17/18

7 DAY TRAINING PROGRAM ON

GO KART DESIGN AND DEVELOPMENT

India's biggest "AUTOMOBILE & VEHICLE DYNAMICS" Training Program

Main Highlights of the ***07 day / 56 hours*** *Training Program,*

- Statics & dynamics of automobile engineering - 1 Day
- Designing of automotive components - 1 Days
- Automotive components development - 3 Days
- Final vehicle assembly - 1 day
- Automotive testing & tuning - 1 day

1) Static: In this part we will be discussing static parts of automobile that how each and every component works,

- Fundamentals of chassis design
- Suspension system
- Braking system
- Steering system
- Engine working and fundamentals
- Working and explanation of latest technologies like CRDI engine and many more

2) Dynamics: In this part we will be discussing dynamics of automobile in deep and discuss how to balance all the components of a vehicle,

- Steering dynamics
- Braking performance triangles
- Braking performance triangles & kinetic energy dissipation theory
- Chassis designing parameters
- Derivation of drifting equation and turning equation
- Designing parameters for suspension designing.
- F.E.A
- Engine valve timing diagram and engine designing parameters

3) Designing: **This will be the implementation of the things that we will learn in above two parts,**

- **Ergonomics considerations in designing of a car**
- **Ride & handling consideration in design**
- **Suspension designing parameters – camber angle, rolling camber, dynamics camber balancing, castor angle, KPI, scrub radius etc.**
- **Suspension lift point designing**
- **Chassis designing and stress analysis of each component**
- **Basic as well as complex surface generation**
- **Decaling and rendering of a vehicle**
- **Vehicle fabrication steps and technique**
- **Tools & commands of designing, features – weldments, sketch, evaluate, office products,**
- **Designing of tires & rims**

4) Fabrication: **In this part we will be manufacturing the Go kart from very scratch which all includes,**

- **Cutting and bending of chassis members**
- **Welding, grinding of chassis members**
- **Fixtures mounting, primary members profile making**
- **Installation of drive train, rear axle and power transmission**
- **Engine mounting and it's tuning.**
- **Brake bleeding and installation of braking, steering assembly**
- **Wheel assembly, tire pressure calibration, cornering ability test**
- **Tuning & test run of Go Kart by all the students**

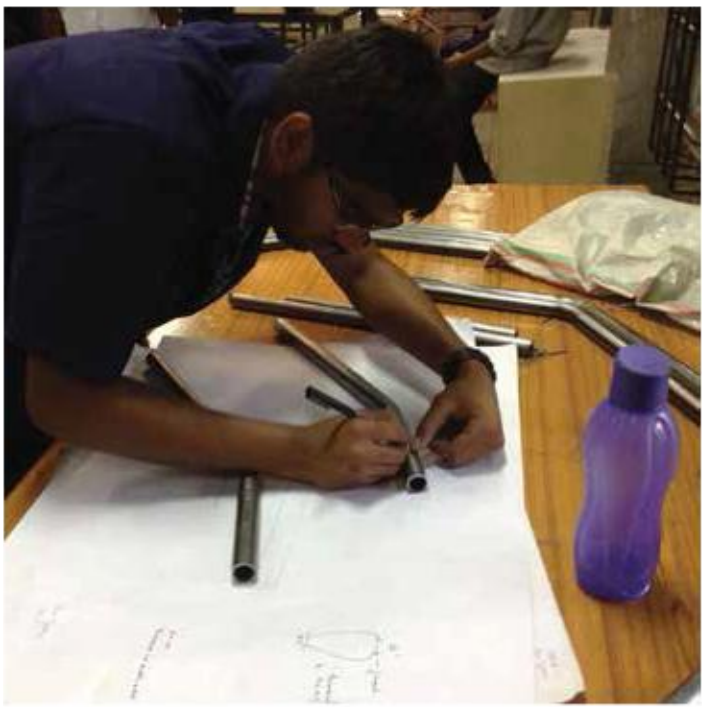
Day wise description

Day 1 Topics,

- *Introduction to "Automobile Engineering"*
- *Difference b/w super, ATV, sports, formula car*
- *Chassis*
- *Goals of chassis*
- *Types of chassis:* a) *Monocoque* b) *Ladder-frame* c) *Space-frame* d) *Back-bone chassis*
- *Types of cars based on that*
- *Different "Pillars" in cars(A, B, C, D pillars)*
- *Concept of pillars and boxes in a sedan, SUV, hatchback.*
- *Rigidity and uses of different types of chassis*
- *Suspension system for on road and off road applications*
- *Types of suspension springs*
- *Uses and applications of each*
- *Concept of all terms related to suspension designing (camber / caster / king pin inclination / toe angle / bump & rebound / spring rate / camber thrust / jacking forces)*
- *Types of dampers and application*
- *Suspension mechanisms*
- *Equal and parallel*
- *Unequal and parallel*
- *Unequal and unparallel*
- *Tire slip angle*
- *Scrub radius*
- *Tire mechanism*
- *Tire nomenclature*

Day wise description

Day 2 Topics,



- Steering mechanism
- Types of steering mechanism
- Co-ordinate system for mechanism
- Euler angles
- Turning radius
- Cornering stiffness
- Slip angle
- Steering ratio
- Derivation of turning equation
- Concept of understeer and oversteer
- Concept of drifting
- Suspension designing and balancing parameters
- F.E.A
- Anti-dive and anti-squat geometry
- Balancing of double wishbone suspension for off-road and on-road application
- Spring rate and dynamic camber calculation
- Camber change rate
- Front view swing arm & side view swing arm length calculation
- Braking mechanism
- Braking dynamics
- Braking performance triangles
- Designing parameters for disc brakes
- Introduction to CAD desiging, basic use of CAD tools
- Assembly feature in CAD
- Assembly of sub-components on frame

Day 3 Topics,

- F.E.A
- Stress analysis on chassis, frame and different sub-assembly of vehicle
- Bending of chassis primary member
- Fixtures mounting
- Primary members profile making
- Welding of chassis members

Day wise description

Day 4 Topics,

- Drive train installation
- Engine mounting
- Rear axle installation
- Power transmission unit installation

Day 5 Topics,

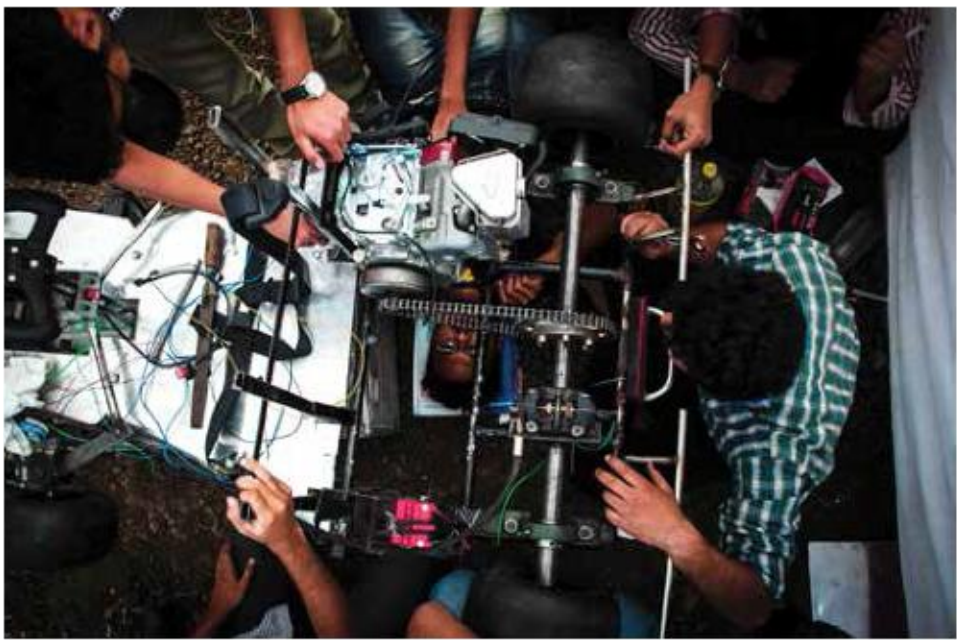
- Braking system installation
- Steering system installation

Day 6 Topics,

- Brake bleeding
- Kill switch installation
- Engine tuning
- Power-train adjustments

Day 7 Topics,

- Tire pressure calibration
- Brake test
- Cornering ability test
- After complete fabrication, participants will do rigorous testing of the Go kart and will optimize it's performance



Vehicle specification

Engine

Fuel	Gasoline / Petrol
Installation	Mid , Transverse
Type	208cc, Single cylinder, OHV
Power	6.5 bhp @ 3600 rpm
Torque	7.5 Nm @ 3060 rpm

Transmission

Type	Rear -wheel drive
Clutch	Mechanical automatic
Transmission	Single-speed Chain drive

Dimensions

Wheel Base	44 in
Track Width	38 in
Ground clearance	02 in

Braking

Type	Hydraulic Disc brake
Disc	200 mm petal disc
Caliper	Dual piston
Master cylinder	Hydraulic , Tandem

Steering

Type	Mechanical linkage
Ratio	1:1
Ackerman	110%
Steering wheel	3 spoke 11 inch