# Aditya College of Engineering & Technology

Aditya Nagar, ADB Road, Surampalem – 533437
**Department of Mechanical Engineering**

**Academic Year:** 2020-2021

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|---|---|---|
| **Project Title:** | Design and Analysis of Valve Gear Mechanism using Finite Element Analysis | |
| **Guide Name:** | Mr. A Chiranjeevi V S Prasad | |
| **Students Name with Roll No.:** | 17P31A0309 | BURRI SIVA |
| | 17P31A0325 | NAGAM SATISH |
| | 17P31A0312 | DUDALA SURESH |
| | 17P31A0324 | MUHAMMED ASIN HIJAN |
| | 17P31A0318 | K J D V KRISHNA |

| Abstract | PO's Mapping | PSO's Mapping |
|---|---|---|
| The objective of this project is to modelling design and analysis of a cam and follower. The model is created by the basic needs of an engine with the available background such as rotation acting over the cam by means of valve running. Here the approach becomes fully CAE based. CAE based approach enriches the Research and limits the time duration. Most of the IC engines used in the market have roller cam and follower mechanisms, having a line contact between the cam and the roller follower. The software (CATIA and ANSYS) tool has mainly been developed to enhance learning, but it can readily be used to design modelling and analysis of cam and follower mechanisms for industrial applications. The model will be constructed using CATIA V5 R21 software, which is a powerful modelling and simulating environment of dynamic systems. Contact and Transient structural analysis will be done in Ansys14.5 on the valve gear mechanism for existing material and composite material. The Transient structural analysis generates detailed information about the stress, strain, displacement, velocity etc of the valve gear mechanism. In The contact generates detailed information about contact status, gap, pressure and penetration of the mechanism. It also provides animation of the cam and follower mechanism. | PO1, PO2, PO3, PO4, PO5,PO8, PO9, PO10,PO11,PO12 | PSO1, PSO2, PSO3 |

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|---|---|---|
| **PO1:** Engineering Knowledge | **PO5:** Modern Tool usage | **PO9:** Individual & Team Work |
| **PO2:** Problem Analysis | **PO6:** Engineer & Society | **PO10:** Communication Skills |
| **PO3:** Design & Development of solutions | **PO7:** Environment & Sustainability | **PO11:** Project Management & Finance |
| **PO4:** Investigations on complex problems | **PO8:** Ethics | **PO12:** Life Long Learning |
| **PSO1:** Mechanical Engineers must be able to analyze, design and evaluate mechanical components and systems using cutting-edge software tools as required by the industries from time to time. | **PSO2:** The ability to work in manufacturing and other sectors' operations and maintenance plants | **PSO3:** As part of a team or individually, plan and manage activities in micro, small, medium and large enterprises |

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**Relevance to PO's and PSO's**

| | |
|---|---|
| **PO1** | Applied the subject knowledge in calculation for design and systems |
| **PO2** | Studied and analysed existing designs of Valve Gear mechanism |
| **PO3** | Design of Valve gear mechanism |
| **PO4** | Students will be able to find feasible solution for the problem designed |
| **PO5** | Ansys workbench tools are used for design and simulation. |
| **PO8** | Students will be able to apply ethical principles and commit to professional ethics |
| **PO9** | Design of components done by the team collaboration |
| **PO10** | Students able to present their work through presentation and documentation |
| **PO11** | Plan of action of completing the project |
| **PO12** | Further students can improve results by learning advanced tools |
| **PSO1** | Identify the problem, able to create design and analysis with suitable boundary conditions using Ansys software |
| **PSO2** | Proper analysis is required in manufacturing industry |
| **PSO3** | Suitable management skills gained |