

**MAHATMA GANDHI INSTITUTE OF TECHNOLOGY (ATONOMOUS)**  
**DEPARTMENT OF MECHANICAL ENGINEERING (MECHATRONICS)**

PROJECT DETAILS of IV/IV B.Tech. II Semester AY: 2022-23

**Branch:**

**Project type: Project Stage 2**

Commencement of Class Work: 6/02/2023

1	Title of the Project	Design and development of automated Tyre inflation system
	Nature of the Project	Experimental / Design / Simulation / Prototype:
	Name of the Project Guide	BV Himasekhar Sai
	Name of the students in the Batch with Roll numbers	P. Sahtya Prasad - 19261A0373
		Lohith .P - 19261A0375
		Rama Krishna. MG - 19261A0376
		Sharath Chandra .U - 19261A0385
2	Problem Outline and Objective of the Project	<p><b>Problem Outline:</b></p> <p>Designing an automated tire inflation system for vehicles to ensure optimal tire pressure for improved fuel efficiency, increased tire life, and enhanced safety.</p> <p><b>Objectives of the project:</b></p> <ul style="list-style-type: none"> <li>• Extended tire life due to proper tire inflation.</li> <li>• Increases fuel efficiency.</li> <li>• Variation and Optimization of tire pressure according to road conditions with reduced manual effort.</li> <li>• Improved vehicle stability and reduces the risk of accidents.</li> <li>• Low maintenance cost and Enhanced Environmental performance</li> </ul>
3	Proposed Method	<p><b>Methodology:</b></p> <ol style="list-style-type: none"> <li>1. Design specifications based upon the objectives.</li> <li>2. Systematic data collection on vehicle, its tires, pressure sensor and other external factors which affect the Vehicle's performance.</li> <li>3. Analyse the data, examining the effects of factors effecting the system performance.</li> <li>4. Develop a model to simulate the behaviour of the automated tire inflation system.</li> <li>5. Validate the model by Root cause analysis and cost-benefit analysis.</li> <li>6. Optimise the system with software programme for embedded micro controller.</li> </ol>

		7. Implement and Monitor the system to ensure the defined objectives.
4	Lab Facilities Requirement	Electronics Lab -to design signal generators, power supplies Mechanical Lab -Drilling , Welding, Cutting, Computer lab -Program development.
5	Timeline for Completion	14 weeks
6	Proposed date of completion	03/06/2023
	Dead line for completion	10/06/2023
	Scheduled Review Date	13/06/2023
7	Outcome of the Project	<ul style="list-style-type: none"> <li>✧ Tyres are always properly inflated and thus improves the tyre life, safety, reduction of gas mileage and vehicle performance by supplying air to all tyres via hoses and a rotary joint fixed between wheel spindle and wheel hub at each wheel whenever there is a pressure drop inside the tyre.</li> <li>✧ Precise tire pressure control: The microcontroller can accurately measure and maintain tire pressure within a specified range, ensuring optimal tire performance and safety.</li> <li>✧ Real-time monitoring: The microcontroller can continuously monitor tire pressure and provide real-time alerts to drivers or maintenance personnel in case of any deviations from the desired pressure range.</li> <li>✧ Controls Tyre pressure changes due to change in atmospheric temperatures.</li> </ul>
8	Date of Evaluation	

Signature of the Students

1. P Sathya prasad Reddy (19261A0373)

3.M G Ramakrishna (19261A0376)

2.P Lohith (19261A0375)

4.U Sharath Chandra (19261A0385)

Signature of the Guide:

Head of the Dept.

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Commencement of Class Work: 6/02/2023

1	a. Title of the Project	Design and development of automated Tyre inflation system	
	b. Batch No	6	
	c.Name & Roll Nos of the Project batch Students	P. Sahtya Prasad	- 19261A0373
		Lohith .P	- 19261A0375
		Rama Krishna. MG	- 19261A0376
		Sharath Chandra .U	- 19261A0385
2	<b><u>Progress of the Work:</u></b> The materials and components are procured and are being assembled. The electronic circuit has been designed and has been tested artificially using normal syringe to obtain small pressures. This electronic unit will be implemented in the system and final testing will be done soon. Currently working on the system to prevent the air leakage through the system		
3	<b><u>Remarks of the Guide: (Satisfactory / Not Satisfactory)</u></b>		

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2	<b><u>Progress of the Work:</u></b> The team successfully completed the initial design phase, incorporating all the essential features and functionalities into the prototype. The construction phase proceeded smoothly, with careful attention to detail and adherence to safety standards. The aurdino is programmed in such a way that the set pressure will be maintained in the tyres automatically where high and low pressures are handled by 2 relays adjusted in the system. The team encountered a few minor challenges during the integration of various components but efficiently resolved them through collaborative problem-solving. Testing was diligently conducted to ensure the prototype's functionality and performance. The prototype building demonstrates promising results, meeting the project's objectives and serving as a solid foundation for further refinements and future development.		
3	<b><u>Remarks of the Guide: (Satisfactory / Not Satisfactory)</u></b>		

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