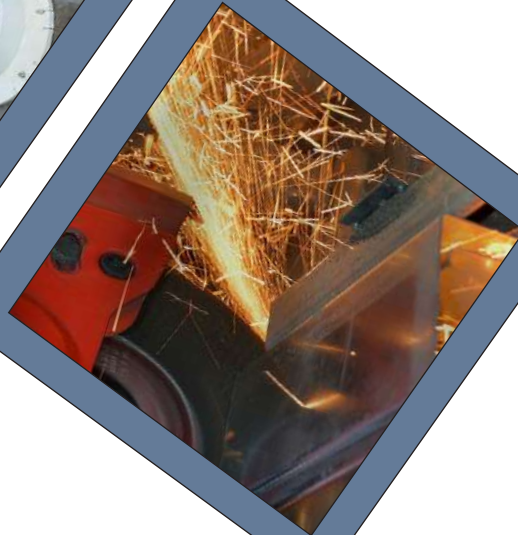


# DEPARTMENT OF MECHANICAL ENGINEERING



EDITION-3  
Vol.2  
JUNE-2023



**GANGA INSTITUTE OF TECHNOLOGY  
AND MANAGEMENT, KABLANA**





**GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT**

**DEPARTMENT OF MECHANICAL ENGINEERING**

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## DIRECTOR'S MESSAGE



**DR. AMAN AGGARWAL**

**GITAM, KABLANA**

“  
**‘Mech G Connect’ (ME newsletter), vol.2 is a testament to the collaborative spirit and passion of faculty and students of Mechanical Engineering Department. We aim to foster a strong sense of belonging, connecting students, faculty, and alumni on a common platform. I extend my gratitude to the editorial team and all contributors for their dedication in making this newsletter possible. I encourage all readers to engage with the enriching content and stay connected with our ever-evolving community. Wishing you an enjoyable read and looking forward to the continued growth and success of ‘Mech G Connect’.**  
”

## HOD'S MESSAGE



**MR. VIVEK**

**GITAM, KABLANA**

“

I am thrilled to announce the release of our Departmental Newsletter, “MECH G CONNECT.” This publication showcase our achievements and student accomplishments. I extend my gratitude to the Newsletter Committee for their hard work and contributors for enriching the content. The newsletter will be a continuous project, welcoming your future contributions. Congratulations to all for making this newsletter a reality!

”

## VISION MISSION OF INSTITUTE

### VISION

**G**ITAM aims to be an outstanding Institute in India through academic excellence in the field of Technology and Management to fulfill the need of the Industry and serve the society.

### MISSION

- To Provide healthy environment to our students as well as faculty members.
- To achieve excellence in technical education
- To promote holistic development of students through interaction with alumni, academia, Industry and expert lectures.
- To attract nurture and retain the best faculty and technical manpower.
- To promote research and development Initiatives.
- To contribute to the society by inculcating professional ethics in the students.

## DEPARTMENT OF MECHANICAL ENGINEERING

### VISION

“To become a center of excellence in the field of Mechanical Engineering, committed to address societal challenges and evolving needs of industry.”

### MISSION

- To achieve excellence in mechanical engineering by providing outcome-based education in a healthy learning environment.
- To enhance the student’s technical and entrepreneurial skills by providing advanced learning facilities and co-curricular activities.
- To inculcate professional ethics, leadership qualities, and moral and social values among students through interaction with alumni and experts from industry and academia.
- To encourage students to research and innovate through project works, workshops, conferences, training sessions, etc.

## PROGRAM OUTCOMES

Engineering Graduates will be able to:

- ⇒ **PO-1 Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- ⇒ **PO-2 Problem Analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- ⇒ **PO-3 Design/Development of Solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- ⇒ **PO-4 Conduct Investigations of Complex Problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- ⇒ **PO-5 Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitation.
- ⇒ **PO-6 The Engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- ⇒ **PO-7 Environment and Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- ⇒ **PO-8 Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- ⇒ **PO-9 Individual and Teamwork:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

- ⇒ **PO-10 Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- ⇒ **PO-11 Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply the set to one's own work, as a member and leader in a team, to manage projects and in multi-disciplinary environments.
- ⇒ **PO-12 Life-long Learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### PEO (PROGRAMME EDUCATIONAL OUTCOMES)

The students will be able to:

- ⇒ **PEO-1** To produce competent Mechanical Engineers, capable of applying the knowledge of contemporary Science and Technology, to meet the challenges in Mechanical and allied Engineering fields.
- ⇒ **PEO-2** To prepare the Mechanical Engineering graduates to work in diverse fields in different capacities involving individual and teamwork.
- ⇒ **PEO-3** To inculcate among the students a sense of ethics, morality, creativity, leadership, teamwork, and professionalism.
- ⇒ **PEO-4** To instill in the students, the ability to take up innovative research projects and to conduct investigations of complex Mechanical Engineering problems using research-based methods.

### PSO (PROGRAMME SPECIFIC OUTCOMES)

The students will be able to:

- ⇒ **PSO-1** Solve the real life problems by integrating design, thermal and manufacturing areas of Mechanical Engineering.
- ⇒ **PSO-2** Adapt to rapid changes in the field of Mechanical Engineering and excel in a multidisciplinary work environment.

## ABOUT MECHANICAL ENGINEERING

The Department of Mechanical Engineering was established in 2010 with the aim to provide the best knowledge and environment to ensure complete success in whatever field the students choose. This Department is one of the key strength of the Institute. It is making very sincere efforts to produce excellent Mechanical Engineering graduates to meet the present day needs of organizations and the Industry. The experienced and dedicated faculties along with its excellent facilities provide the necessary resources to keep the students updated with the latest industrial trends. The department has created state-of-the-art infrastructure in terms of Workshops, Laboratories and other facilities.

PROGRAMME	DURATION	INTAKE
B.TECH MECHANICAL ENGINEERING	4 YEARS	120
B.TECH MECHANICAL ENGINEERING (LEET)	3 YEARS	12
M.TECH MACHINE DESIGN	2 YEARS	12
M.TECH MANUFACTURING AND AUTOMATION	2 YEARS	18

## ABOUT ME MANUFACTURING COMPANY





## CERTIFICATE COURSE

The Department of Mechanical Engineering conducted a five days certificate course on “CNC MACHINING” from 30/01/2023 to 03/02/2023. Mr. Anand Tyagi was the resource person of this interactive session.

**Objective:** This course covers Fundamentals and concepts of CNC Machining and offers more hands on experience through which the participants will be developing CNC programs and machining complicated shapes by using the CNC machine tools.

**Course Outcomes:**

- Have knowledge of work and tool holding devices on CNC Machines.
- Job setting and simple programming on CNC Machines.
- Simulate tool movements programs using software.
- Perform machining operations on CNC Machines.
- Checking the quality of machined components



## INDUSTRIAL VISIT AT “KORUS ENGINEERING SOLUTION PVT LTD”

**Objective:** Purpose of visit was to provide an opportunity to the students to have real insight into machining processes and experience the working environment on the shop floor area. So that students will be able to compare their theoretical knowledge with the practical one.



**About Korus Engineering Pvt Ltd:** KORUS Engineering Solutions is associated with the development of the steel industry, products of which touch everyday life. In the company, there are a team of more than 200 highly qualified and experienced professionals in all the relevant Technical and Engineering Disciplines.



**CONCLUSION:** This industrial visit will benefit the students in terms of learning working culture on shop floor area & various machining processes like turning, taper turning, drilling, welding, boring, working in piping industry, Automatic Assembling and Design & Development. During plant visit, students passionately interacted with the Senior retired engineer from various PSUs (SAIL, JINDAL STEEL, L&T) to learn all the basics of concerned processes and cleared their doubts. Overall it was very nice, knowledgeable and fruitful to visit Korus Engineering solutions Pvt Ltd.

## INDUSTRIAL VISIT AT “JAGGA FOOTWEAR PVT LTD”

**Objective:** Purpose of visit was to provide an opportunity to the students to have real insight into manufacturing processes and experience the working environment on the shop floor area. So that students will be able to compare their theoretical knowledge with the practical one.



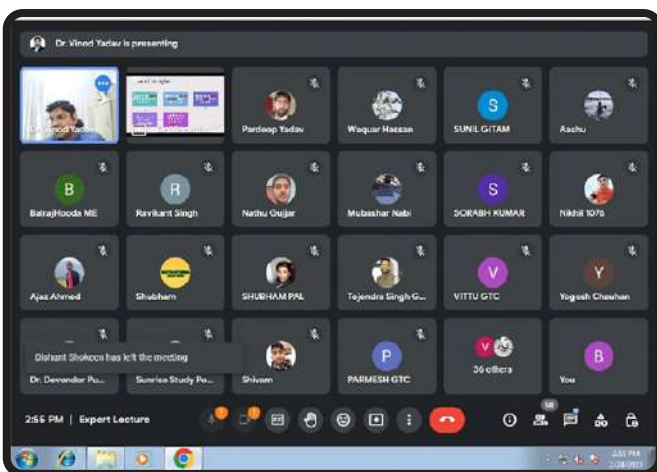
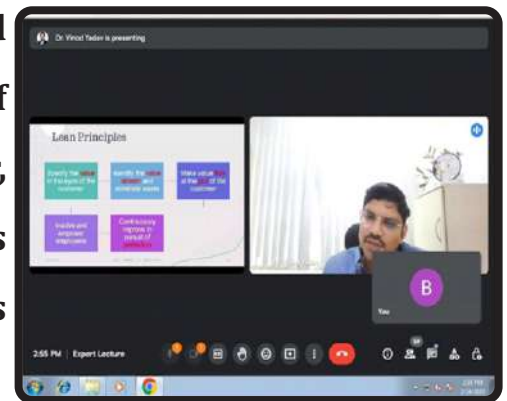
India is the second largest global producer of footwear after China, accounting for 13% of global footwear production of 16 billion pairs. India produces 2065 million pairs of different categories of footwear (leather footwear - 909 million pairs, leather shoe uppers - 100 million pairs and non-leather footwear - 1056 million pairs). India exports about 115 million pairs. Thus, nearly 95% of its production goes to meet its own domestic demand.



**CONCLUSION:** This industrial visit benefit the students in terms of learning working culture in a footwear manufacturing unit. The students understand the basics of design and manufacturing steps in making footwear's. During plant visit, students passionately interacted with the senior retired engineer to learn all the basics of concerned processes and cleared their doubts. Overall it was very nice, knowledgeable and fruitful to visit Jagga Footwear Pvt Ltd.

## EXPERT LECTURE ON “LEAN MANUFACTURING”

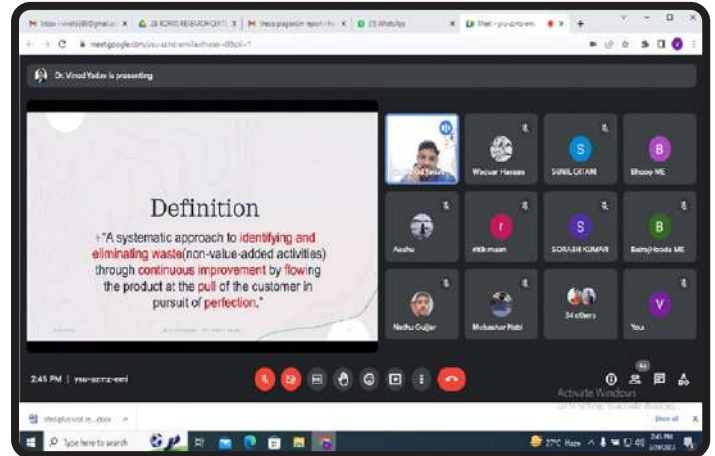
Expert Lecture on “Lean Manufacturing” was organized for students of the Mechanical department on 24th of February 2023. Dr. Vinod Yadav (Assistant Professor, School of Automobile, Mechanical & Mechatronics Engineering, Manipal University, Jaipur) was invited as the expert.



**Lean manufacturing:** Lean manufacturing is a production process based on an ideology of maximizing productivity while simultaneously minimizing waste within a manufacturing operation. The lean principle sees waste is anything that doesn't add value that the customers are willing to pay for.

**Table of Content:**

- Lean Manufacturing basics and its domains
- Evolution of Lean Manufacturing
- Lean Philosophy
- Guiding Principles of Lean Manufacturing
- Wastes Associated With Lean Manufacturing
- Basics of TPS 14 Principles
- Lean Manufacturing Tools (5S, Value Stream Mapping, Kaizen, Kanban, SMED, Poka Yoke, Six Sigma etc.)

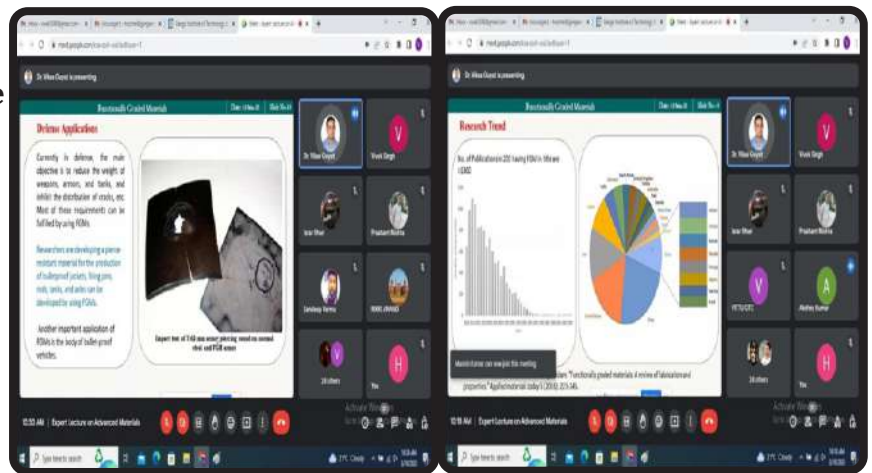


**EXPERT LECTURE ON “ADVANCE MATERIALS”**

An Expert Lecture on “Advanced Materials” was organized for students of the Mechanical department on 18th of March 2023. Dr. Vikas Goyat (Assistant Professor, SRM University, Gaziabad) was invited as the expert.

**Table of Content:**

- Introduction to Functionality Grade Material (FGM).
- Applications.
- Advantages.
- Design & Processes.
- Manufacturing Techniques

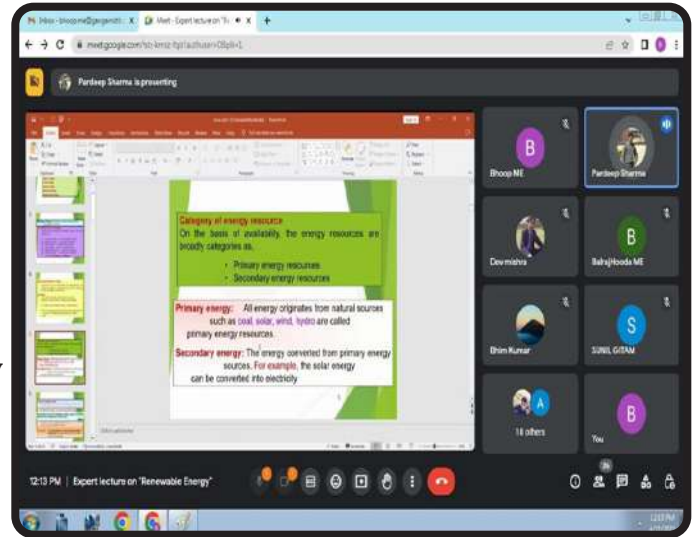


**EXPERT LECTURE ON “RENEWABLE ENERGY”**

An Expert Lecture on “Renewable Energy” was organized for students of the Mechanical department on 21th of April 2023. Dr. Pardeep Sharma (Assistant Professor, MRIEM, Rohtak) was invited as the expert.

**Table of Content:**

- Introduction
- Resource Base
- Renewable Electricity Generation Technologies
- Economics of Renewable Electricity
- Environmental Impacts of Renewable Electricity Generation
- Deployment of Renewable Electric Energy



**WORKSHOP ON "INDUSTRIAL DESIGN & DEVELOPMENT WITH SMART MANUFACTURING TECHNOLOGY"**

Workshop on "Industrial Design & Development with Smart Manufacturing Technology" was organized for students of the Mechanical Engineering Department on 24th of March 2023. Mr. Kailash was invited as the expert.

**Table of Content:**

- What is industry 4.0
- Skill required for industry 4.0
- Smart manufacturing development.
- Advance manufacturing department.
- Industrial manufacturing scenario.



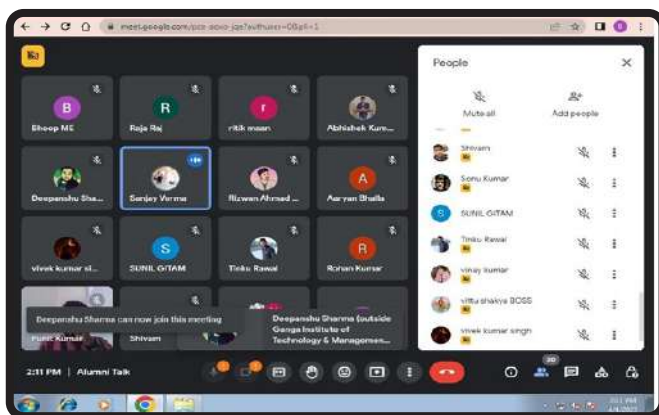
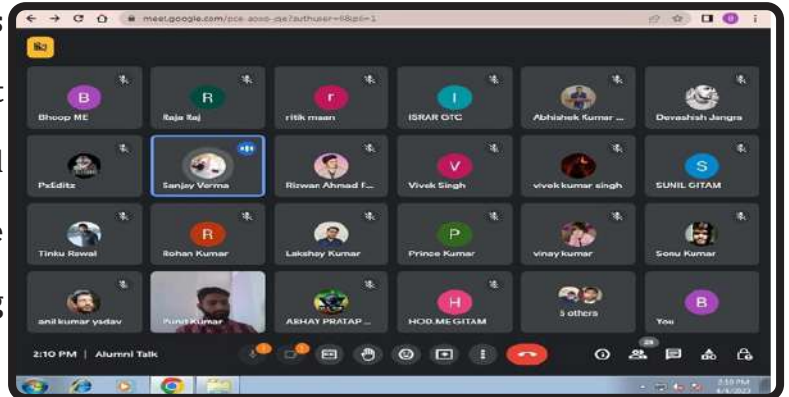
**Purpose of this workshop is to understand:**

- Industrial design and related software technology used in industry.
- Design & prototype development.
- Current industrial need.
- Requirement of industry 4.0

**CONCLUSION:** Workshop on industry 4.0 in smart manufacturing was arranged for mechanical engineering students for enhancing their technical skill to give them the awareness of industry technology currently in use.

## ALUMNI TALK

An Alumni Talk was organized for students of the Mechanical Engineering Department on 04th of April 2023. Mr. Sanjay was invited for Alumni Talk. He interacted with the students and gave career guidance regarding jobs in the mechanical engineering field..



**Objective:** Alumni talk helps the student to better understand their curriculum and the use of curriculum during their job. Alumni talks become an eye opener for the students on how to enter a company after completion of their course and use their skill for better performance.

## EXTENSION ACTIVITY ON “POLLUTION CONTROL AWARENESS PROGRAM”

Hazardous air pollutants can affect human health in a number of ways including skin, throat and eye irritation, headaches, nerve and organ damage, and increased risk of cancers and premature death. This usually happens when the pollutants are breathed in over long periods of time as they can accumulate in our bodies. However some hazardous air pollutants can have a more immediate effect.



## RESEARCH AT MECHANICAL ENGINEERING

International Journal For Technological Research In Engineering  
Volume 10, Issue 10, June-2023 ISSN (Online): 2347 - 4718

### Examining the Role of Mechanical Metamaterials in Advancing Engineering Solutions

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**Abstract:** This research focuses on mechanical metamaterials, a class of materials with distinctive properties that offer promise for a variety of practical applications. The study will look at their design, manufacture, and characterization, with a focus on increasing mechanical system performance. The project advances mechanical metamaterials and their real-world applications by creating a unique design approach and demonstrating prospective engineering applications. The research examines several fabric types based on comfort, utility, cost-effectiveness, scalability, and stretchability, offering insights into which fabric is most suited for certain purposes. Overall, this study is useful for engineers and researchers interested in using mechanical

to have mechanical properties that allow them to absorb and disperse energy in a regulated manner, making them appropriate for use in applications such as impact-resistant materials and protective gear. These materials may also be engineered with precise mechanical qualities that enable them to absorb and disperse energy in a regulated way. Mechanical metamaterials have the potential to revolutionize robotics by enabling the creation of soft, flexible robots that can adapt to their environment. The capacity of metamaterials to adapt to their environment might make this conceivable. Engineers can create robots capable of crawling, climbing, and even swimming in complex settings by inventing metamaterials that can change structure and features in response to environmental inputs.

 International Journal of Scientific Research in Engineering and Management (IJSREM)  
Volume: 07 Issue: 06 | June - 2023 SJIF Rating: 8.176 ISSN: 2502-3930

### Exploring the Integration of Artificial Intelligence and Machine Learning in Metal Additive Manufacturing

<sup>1</sup>Vikram Singh (PG student at GITAM), Dr. Devender Singh Punia (Asst. Professor at GITAM)

#### ABSTRACT

Additive manufacturing (AM) and artificial intelligence (AI) are both disruptive emerging technologies, while AI has permeated various aspects of our lives, its full potential in the realm of AM has yet to be fully explored. With its abundance of data and digital nature, AM presents significant opportunities for advancements in machine learning (ML) and consequently AI. This article offers a perspective on the applications of ML and AI in AM, particularly in powder bed AM technology. It discusses the various types and sources of data, potential variations in experimental and simulation data, and the suitability of these data for ML algorithms. Moreover, it presents novel ideas on how the integration of these two transformative technologies can profoundly impact the application of AM across diverse fields. Finally, it outlines a vision for the future direction of AM to fully harness the advantages of AI.

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### A Study on advanced Design and Simulation of Automobile Active Suspension System

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Mechanical Engineering  
M. Tech (Machine Design)  
Ganga Institute of Technology And Management, Kablana, Jhajjar

**Abstract:** Active suspension systems have started to be used by manufacturers to improve the ride, handling, and stability of the vehicle. Instead, then depending on springs and shock absorbers, as is the case with more traditional, passive suspension systems, active suspension systems use sensors, actuators, and computer algorithms to perform on-the-fly suspension modifications in response to changing road and vehicle conditions. An active suspension system is intended to maintain the ideal ride height, which is the distance between the chassis of the car and the ground. To take into account changes in the vehicle's load, the road's surface, and the driver's speed, the suspension is automatically changed in real time. This keeps the tires in close touch with the surface, improving the vehicle's manoeuvrability, stability, and traction. Through

**Keywords:** Automobile Active Suspension System, Sensors, Control Unit, Actuators, Suspension System

#### I. INTRODUCTION

To enhance the vehicle's ride, handling, and stability, manufacturers have begun using active suspension systems. Active suspension systems employ sensors, actuators, and computer algorithms to make on-the-fly suspension adjustments in response to changing road and vehicle conditions, rather than relying on springs and shock absorbers as is the case with more conventional, passive suspension systems. The optimal ride height, or distance between the vehicle's chassis and the ground, is what an active suspension system is designed to preserve. The suspension is automatically adjusted in real time to

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### Investigating the Application of IoT in Autonomous and Connected Vehicles

Aman Kumar (Scholar)  
Mr. Pardeep Kumar (Assistant Professor) Mechanical Engineering  
M. Tech. (Machine Design)  
Ganga Institute of Technology and Management, Kablana, Jhajjar

**Abstract:** The Internet of Things (IoT) in self-driving and connected vehicles ushers in a new age of mobility and alters our expectations of automobiles. This study looked at how changing elements affect autonomous and connected vehicle function and usability. The impact of IoT becomes clear when seen as a tool for increased connection, data-driven customisation, and wireless upgrades. Finally, the Internet of Things has enhanced maintenance. Sensors linked to the internet allow autos to monitor their components, diagnose problems, and schedule repairs. Preventive maintenance lowers failure rates, saves money, and improves dependability. The research discovered that predictive maintenance might save money, showing yet another advantage of the Internet of Things. Have a long-term impact on car usage. Connectivity, customization, OTA updates, security, energy savings, entertainment, autonomy, and service quality are all improved by IoT. Connection has become a user experience standard because to real-time data tailored

**Keywords:** Internet of Things, autonomous vehicles and connected vehicles, V2I, V2V

#### I. INTRODUCTION

The "Internet of Things" (IoT) is a network of interconnected devices. This cutting-edge technology is revolutionizing various industries, including automobiles. The automotive industry is making extensive use of the Internet of Things (IoT) to develop self-driving and connected vehicles. Autonomous vehicles are ones that can operate without the help of a human driver. Simply described, "connected vehicles" are autos that can communicate with other devices, machinery, and systems. This research looks on the usage of the Internet of Things in autonomous and networked vehicles.

**1.1 IoT in Vehicles**  
**IoT in Autonomous Vehicles:** The usage of the Internet of Things (IoT) in fully autonomous vehicles has had far-



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### Design and Fabrication of Horizontal Axis Wind Turbine

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<sup>2</sup>Associate Professor, Department of Mechanical Engineering, School of Engineering & Technology (A Unit of Ganga Technical Campus), Soldha Bahadurgarh

#### ABSTRACT

One of the potential renewable energy sources utilised to produce electricity is wind energy. In our industrial world, the hunt for sustainable, environmentally-friendly energy has gained momentum. The existence of energy is crucial to the current global technological civilization. Power availability is completely dependent on the expansion of industry, agriculture, and transportation, etc. Due to the rise in power demand and depletion of the traditional energy resources that are utilised to produce electricity, energy prices are rising day by day. The utilisation of non-conventional energy sources, such as wind, solar, tidal energy, etc., is thus crucial. One of the most promising forms of renewable energy, according to experts, is wind.



## PROGRAMMES OFFERED

M. TECH

B. TECH (LEET)

MCA

B. TECH

MBA

BCA

BBA



# GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT

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