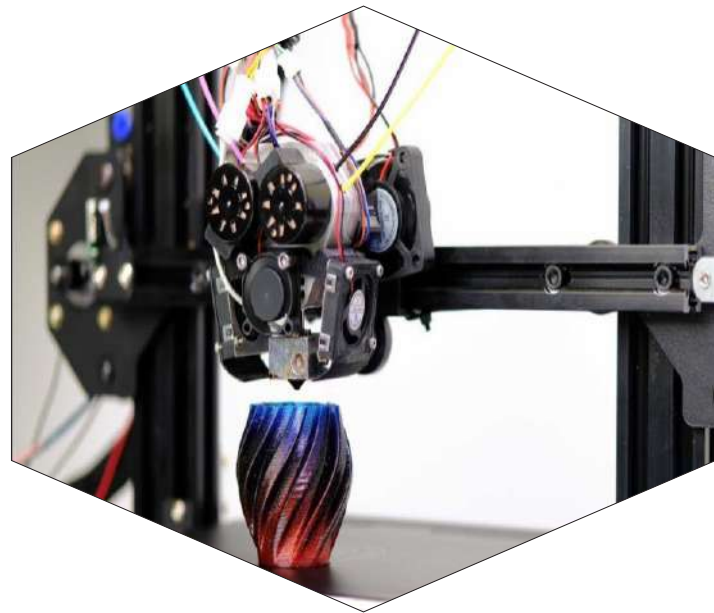


DEPARTMENT OF MECHANICAL ENGINEERING



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**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

GITAM 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	90
B.TECH MECHANICAL ENGINEERING (LEET)	3 YEARS	09
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 25/04/2022 to 29/04/2022. 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



EXPERT LECTURE ON “AUTO CAD”

An Expert Lecture on “CAD” was organized for students of the Mechanical department on 15th of March 2022. Mr. Sahil was invited as the expert.

Objective: Autocad is used to create computer aided designs or software applications including drafting & developing the application in both the 2D and 3D formats and providing the information to the application. Autocad provides tools to design the softwares used in the industry, architectures and project management.



After completing this session, participants will be able to:

- Demonstrate basic concepts of the AutoCAD software.
- Apply basic concepts to develop construction (drawing) techniques.
- Understand geometric construction
- Produce 2D Orthographic Projections
- Understand and demonstrate dimensioning concepts and techniques
- Understand Section and Auxiliary Views

INDUSTRIAL VISIT AT “CLP (APRAAVA) THERMAL POWERPLANT”

Objective: The visit was organized by the college in a thermal power plant to provide basic knowledge of power production and experience the working environment of the production unit. So that students are capable enough to correlate the theoretical cycle of power plant with Rankine's practical cycle.



At first, Plant operational engineer instructed about the safety precautions to be followed by the visitors during presentation and industrial visit also. They gave valuable information about thermal power plant which works on Dr. Rankine Cycle and also compared this cycle with Carnot cycle which is most efficient cycle in thermal power plant. Overall they summarized their training with useful questionnaire which were asked from interested students. At last, Assistant Manager, Operational Engineer and other staff members were very supportive.

CONCLUSION: This thermal power plant visit will be fruitful for the students in terms of learning working culture & various power plant operations which correlate the thermal engineering concepts. During the plant visit, students enthusiastically interacted with the plant operational engineer to learn all the basics of power production and cleared their doubts about Dr Rankine cycle. Overall, thermal power plant visit was highly appreciable and fruitful for students to see live power production.

RESEARCH AT MECHANICAL ENGINEERING

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Compressive Force Analysis on Piston of Automatic Screw Jack Compression Dustbin

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Abstract - The spread of urbanization has happened very rapidly in a developing country like India. And the same amount of waste production has also increased. Efficiently managing waste is a huge problem and challenge for us. This paper outline efficient and effective approach to handling waste production. In this paper, Automatic screw jack compression dustbin is built on screw jack mechanism which operated by low torque motor using very high torque ratio belt and pulley linkage by which a very high compressive force achieved on the piston of screw jack and the motor is connected to an Arduino Uno board which consist of a microcontroller and the microcontroller circuited with the Ultrasonic sensor. The location of Ultrasonic sensor little lower from the topmost portion and opposite side of opening of dustbin. The microcontroller Arduino will be programmed such as when the dustbin full, the motor

top portion of dustbin which detect the level of waste and send signal to microcontroller which present on Arduino Uno, this Arduino Uno programmed in such a way that when the garbage full at dustbin the motor starts rotating the screw jack compression mechanism done and the garbage compressed by a heavy compressive force.

II. LITERATURE WORK

L Gogoi [1] Solid Waste Disposal and its Health Implications in Guwahati City 2012 This project based on Improper management of waste causes air pollution which affects our environment leading to many adverse effects on human health. In a paper published

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Design and Structural Analysis of Pick & Place Robotic Arm

Pushpendra Kumar Bhandari¹, Nitin Jain ²
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Abstract - Now days in this fast-growing industrial age every company needs speed in manufacturing to cope up with the customer's requirements. Every industrialist cannot afford to transform his unit from manual to semi-automatic or fully automatic as automation is not that cheap in India. The basic objective of our project is to develop a versatile and low-cost robotic arm which can be utilized in any industry to eliminate this problem. Our robotic arm can be used in number of applications by changing the program of controller and the structure is designed in such a way that it is capable to lift light loads but can also lift medium loads. Our robotic manipulator would be used mainly in the packaging department and automatic assembly lines. Mankind has always strived to give life like qualities to its artifacts in an attempt to find substitutes for himself to carry out his orders and also to work in a hostile

1.1 Introduction of the thesis
 Robotic structures are challenging because of the involving of dynamic forces. These dynamic forces further amplify themselves during emergency stop operation. Further a pick and place operation has its own operating frequency, if this frequency resonates with the structure it results in dramatic failure so a structure that supports such an operation needs to be stable both in static condition as well as in dynamic condition. The frequency analysis of the outer structure depends on the load by the pedestal and the robot which is totally mounted at the center. The main aim is to avoid the resonance occurrence between the

I. INTRODUCTION



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Design and Fabrication Vertical Axis Wind Turbine

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Abstract: This project aim of utilizing this wind energy in most effective manner to get the maximum electric output, and therefore we selected highway as our installation site where we can take the advantage of the moving vehicles on both the sides of the road. In the present work, turbine is design and fabricated as per the specifications, the blades used are semi-circular shape and are connected to the disc which is connected to shaft. Shaft is then coupled with pulley with the help of bearing, and then pulley is connected to the alternator, which generates the power. The power developed is stored in battery and then can be used for street light, signal or toll. In this project a small model has been created for testing purpose. This project also aims for maximum output with minimum cost indulges, so that the government can think over this project and can implement this type of vertical axis wind turbine on highways at low cost.

Keywords: Vertical axis wind turbine, design, fabrication.



PROGRAMMES OFFERED

M. TECH

B. TECH

B. TECH (LEET)

DIPLOMA

DIPLOMA (LEET)

MBA

MCA

BCA

BBA



GANGA INSTITUTE OF TECHNOLOGY AND MANAGEMENT

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