

KAMESHWAR NARAYAN SINGH GOVERNMENT POLYTECHNIC, SAMASTIPUR

DEPARTMENT OF MECHANICAL ENGINEERING • (ESTD. 2016)

ANNUAL TECHNICAL MAGAZINE | ISSUE 2026

MECHNOVA 2026

***“Design • Manufacture • Innovate
— Engineering the Future”***

A curated annual showcase of student innovation, hands-on learning, advanced manufacturing, industrial exposure, research, placements, and departmental achievements.



■ FEATURE HIGHLIGHTS INSIDE:

- **Core Mechanical Placements: Career Pathways & Recruitment Opportunities**
- **Tier-1 Recruiters:** Placements at reputed organizations including GE Aerospace, Maruti Suzuki, L&T and Jindal SAW.
- **Advanced CNC & CAD/CAM:** 14-day hands-on training at CIPET Hajipur under DSTTE/BSDM
- **Centre of Excellence (CoE):** 3D Printing Centre of Excellence (CoE) Hub established in collaboration with IIT Patna
- **B.Tech Lateral Entry:** Strong performance in admissions to reputed engineering institutions
- **Industrial Exposure:** Hands-on learning in locomotive systems at Samastipur Loco Shed and Railway Workshop
- **Technical Competitions & Innovation:** Participation in technical events, project exhibitions, Hackathons, and innovation-driven activities.
- **Alumni Connect:** Strengthening industry – institute interaction through alumni engagement, mentoring, and career guidance.

■ INSTITUTIONALPROFILE // MECHANICAL ENGINEERING

About The Mechanical Engineering Department

A Legacy of Practical Learning, Innovation & Technical Excellence

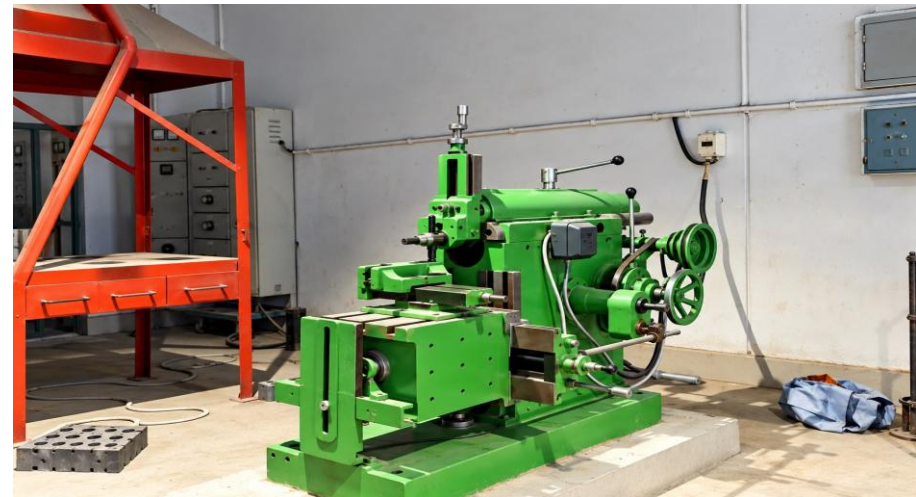
The Department of Mechanical Engineering at K. N. S. Government Polytechnic, Samastipur, is committed to quality technical education and practice-oriented learning in Bihar. Established under the Department of Science, Technology and Technical Education, Government of Bihar, the department offers a three-year diploma in Mechanical Engineering approved by SBTE, Bihar and recognized by AICTE, New Delhi.

The programme builds competence in thermodynamics, fluid mechanics, machine design, materials science, manufacturing technology, CAD/CAM, CNC, and automation.

Students are prepared for careers across automotive, railway, thermal power, manufacturing, automation, and infrastructure sectors, while also being encouraged to pursue higher technical education through B.Tech lateral entry.



60 Intake / Batch Rigorous SBTE & AICTE Approved Curriculum	6 Dedicated Labs Thermal Engg. , R.A.C, F.M, Metrology, SOM, C.o.E Lab.
12,000+ Sq. Ft. Shop State-of-the-art Central Workshop Facilities	98% Placement & LEET High Career Conversion & B.Tech Lateral Entry



Message from Principal Desk

K. N. S. GP SAMASTIPUR



Dr. Aftab Anjum

P. h. D (Mechanical Engineering)
K. N. S. G. P Samastipur

“Transforming Technical Talent into Competent Nation Builders”

Technical education is a vital foundation for national development. At Kameshwar Narayan Singh Government Polytechnic, Samastipur, we are committed to transforming young learners into technically competent, industry-ready diploma engineers who combine academic knowledge with practical skills, discipline, and professional responsibility.

It is a pleasure to present MECHNOVA 2026, the annual technical magazine of the Department of Mechanical Engineering. This edition brings together the achievements, projects, practical training, industrial exposure, research, placements, and creative efforts of our students and faculty.

In alignment with the initiatives of the Department of Science, Technology and Technical Education (DSTTE), Government of Bihar, the department is strengthening practice-oriented learning through its 3D Printing Centre of Excellence (CoE) Hub in collaboration with IIT Patna, specialized CNC/CAD/CAM training at CIPET Hajipur, and industrial exposure at Samastipur Railway facilities. These experiences help students develop relevant technical and workplace competencies.

The department continues to demonstrate strong career outcomes, with core placements involving organizations such as Maruti Suzuki, GE Aerospace, Larsen & Toubro, MRF, and Jindal SAW, along with encouraging performance in B.Tech lateral-entry admissions. I commend the editorial committee, faculty mentors, and students for documenting these achievements with professionalism and pride.

DEPARTMENTAL PILLARS

- **ACADEMIC & PRACTICAL RIGOR**

Strong laboratory fundamentals, workshop machine discipline, and core engineering competency.

- **REGIONAL INNOVATION HUB**

Serving as a regional Centre of Excellence (CoE) in 3D Printing with IIT Patna & specialized manufacturing at CIPET.

- **HANDS-ON INDUSTRY LINKAGES**

Regular vocational immersion at the historic Samastipur Railway Workshop & Diesel Loco Shed.

- **STRONG CAREER OUTCOMES**

Strong core-branch placement outcomes in leading automotive, manufacturing, and heavy engineering firms.

Message from the Head of Department

K. N. S. GP SAMASTIPUR



Prof. JAYRAM KUMAR

B.Tech (Mechanical Engineering)
K. N. S. GP Samastipur

"Empowering Diploma Engineers to Shape India's Industrial Future"

It gives me immense pride to introduce MECHNOVA 2026, the annual technical publication of the Department of Mechanical Engineering at Kameshwar Narayan Singh Government Polytechnic, Samastipur. Our objective is to complement classroom learning with practical shop-floor competence, precision machining skills, and technical innovation within our diploma engineers.

Today's industrial environment demands multi-disciplinary technical proficiency. With rapid advancements in automated tooling, precision machining, and additive manufacturing, diploma engineers must combine core mechanical fundamentals with digital design and modern workshop practices. To support this, our students receive specialized hands-on CNC and CAD/CAM training at CIPET Hajipur (DSTTE & BSDM), gain heavy machinery exposure at the Indian Railways Loco Shed, Samastipur, and engage with our institutional 3D Printing Centre of Excellence Hub established in collaboration with IIT Patna.

Our students continue to achieve exceptional results, recording an outstanding 98% core placement rate with premier recruiters such as GE Aerospace, Maruti Suzuki, L&T, and Jindal SAW, alongside top ranks in B.Tech lateral entry programs, I commend our faculty mentors, the Training & Placement Cell, and the student editorial team for documenting our department's milestones in this issue.

DEPARTMENTAL PILLARS

- **Hands-on Workshop Mastery**

Comprehensive training in central lathe turning, milling, welding bays, and workshop safety.

- **Advanced Manufacturing & Digital Skills**

Specialized 14-day CNC machining at CIPET Hajipur and additive manufacturing with IIT Patna CoE.

- **Industrial Exposure**

Field training at Indian Railways Loco Shed, Samastipur and interactive corporate placement drives

- **Career & Higher Education**

Strong pathways to core employment and higher education through B.Tech lateral entry.

■ ACADEMIC MENTORS // MECHANICAL ENGINEERING

Faculty & Academic Mentors

Our faculty combine academic expertise, professional experience, and research interests to mentor students in technical learning, practical skills, and career development.

Dr. Aftab Anjum Lecturer & Principal-in-Charge In Service Since 2018  Education: Ph.D., M.Tech (Mechanical Engineering) Specialization: Thermal Engineering	Prof. Jayram Kumar Lecturer & Head of Department Joined 2018  Education: B.Tech (Mechanical Engineering) Specialization: Mechanical Engineering	Dr. Piyush Kumar Pathak Lecturer & Student Welfare In-Charge Joined 2023  Education: Ph.D., M.Tech (Mechanical Engineering) Specialization: Thermal Engineering
Prof. Ranjay Paswan Lecturer & Workshop Superintendent Joined 2023  Education: M.Tech (Mechanical Engineering) Specialization: Machine Design	Prof. Sudhir Kumar Lecturer & NATS Coordinator Joined 2023  Education: B.Tech (Mechanical Engineering) Specialization: Mechanical Engineering	Prof. Nuzhat Masoom Lecturer & Girls' Hostel Warden Joined 2023  Education: B.Tech (Mechanical Engineering) Specialization: Mechanical Engineering

Mechanical Department at a Glance

K. N. S. GP SAMASTIPUR

60+ Annual Intake Capacity Approved by AICTE and SBTE Bihar for 3-Year Diploma in Mechanical	180+ Enrolled Students Across 1st, 2nd & 3rd Year Diploma engineering cohorts	06 Core & Materials Testing Laboratories Thermal Engineering, RAC, Fluid Mechanics, Metrology, SOM & CoE Lab.	98% Placement & LEET Outcomes Direct campus recruits and top ranks in Bihar B.Tech LEET exam
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KEY DEPARTMENTAL HIGHLIGHTS | 2025–2026

- ✓ 98% core placement for the 2025 batch and 90% for the 2026 batch.
- ✓ 14-day residential CNC machining and CAD/CAM training completed at CIPET Hajipur under DSTTE/BSDM.
- ✓ Active Centre of Excellence (CoE) Hub in 3D Printing in collaboration with IIT Patna.
- ✓ Practical field immersion and heavy-equipment maintenance training at ECR Loco Shed, Samastipur.
- ✓ Strong student performance in B.Tech lateral-entry (LEET) admissions.
- ✓ Continuous employability training through Mahindra Pride Classroom (Naandi Foundation) and Infosys Springboard.



Industrial Immersion | Loco Shed, Samastipur

Final-year diploma engineering students during an on-site technical visit to the East Central Railway Loco Shed, exploring diesel locomotive systems, mechanical sub-assemblies, and heavy maintenance operations.

Vision & Mission Statements

DEPARTMENT VISION

"To develop competent, innovative and socially responsible diploma engineers equipped with quality technical knowledge, practical skills, ethical values, and the ability to meet the evolving needs of industry and society."

DEPARTMENT MISSION

- M1: To impart strong fundamental knowledge in mechanical engineering principles through outcome-based teaching-learning process as per AICTE norms.
- M2: To develop practical and technical skills in students by providing hands-on training, laboratory work, industry exposure and use of modern tools and technologies.
- M3: To promote problem solving, teamwork and communication skills required for employment, entrepreneurship and higher education.
- M4: To inculcate professional ethics, safety awareness and environmental sustainability in engineering practices.
- M5: To encourage lifelong learning and adaptability to keep pace with technological advancement and industry requirements.

Mechanical Engineering Laboratories

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

- PEO 1: Use basic knowledge of engineering sciences, mathematics and mechanical engineering to work effectively as supervisors or technicians in core mechanical and related sectors.
- PEO 2: Adhere to industrial and public sector organizations, established engineering practices, safety standards, and quality requirements when operating, maintaining and supporting mechanical systems, machines, and processes.
- PEO 3: Using the proper instruments, methods, and contemporary engineering practices, identify and resolve common engineering issues pertaining to manufacturing, production, thermal, and design systems.
- PEO 4: Perform well both individually and as a team, communicate effectively, and exhibit professionalism, discipline, and ethical responsibility in work.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

- PSO 1: Demonstrate proficiency in operating conventional machine tools, CNC setups, welding units, and metrological instruments to manufacture precision mechanical components.
- PSO 2: Generate 2D engineering drawings, 3D parametric CAD solid models, and additive manufacturing prints conforming to industrial standards.
- PSO 3: Inspect, test, maintain, and troubleshoot thermal systems, hydraulic systems, and automobile assemblies efficiently.

Mechanical Workshop & Heavy Machines

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K. N. S. GP SAMASTIPUR

1. Thermal Engg. Lab



Key Apparatus: 4-Stroke Single Cylinder Diesel Engine Test Rig, Multi-Cylinder Petrol Engine Test Rig, Cut-Section Engine Models, Separating & Throttling Calorimeter, Exhaust Gas Analyzer.

Facilitates performance evaluation, heat balance sheet preparation, volumetric efficiency analysis, and study of internal combustion engines and thermodynamic cycles.

2. RAC Lab



Key Apparatus: Vapour Compression Refrigeration Test Rig, Air Conditioning Tutor/Duct System, Domestic Refrigerator Cut-Section Model, Psychrometric Chamber.

Provides practical training in calculating Coefficient of Performance (COP), evaluating refrigeration cycles, diagnosing system faults, and understanding psychrometric processes.

3. Fluid Mechanics & Hydraulic Machinery Lab



Key Apparatus: Venturimeter & Orifice Meter Test Rigs, Pelton Wheel Turbine, Francis Turbine, Centrifugal & Reciprocating Pump Setups, Pipe Friction Loss Apparatus

Enables hands-on verification of Bernoulli's theorem, calibration of flow-measuring devices, and performance evaluation of turbines and pumps under varying operating heads.

4. Metrology Lab



Key Apparatus: Vernier Calipers, Micrometers (Inside/Outside/Depth), Dial Indicators, Sine Bar & Slip Gauge Set, Toolmaker's Microscope, Profile Projector, Bevel Protractor, Surface Roughness Tester.

Trains students in precision measurement, dimensional inspection, calibration techniques, and surface finish assessment to ensure industrial quality control and tolerance compliance

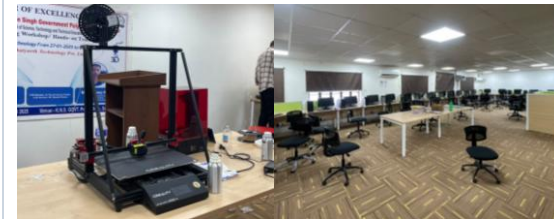
5. Strength of Materials (SOM) Lab



Key Apparatus: Universal Testing Machine (UTM 400 kN), Torsion Testing Machine, Rockwell & Brinell Hardness Testers, Impact Tester (Charpy & Izod).

Students evaluate mechanical behavior including tensile strength, yield stress, shear modulus, toughness, and ductility of diverse engineering alloys.

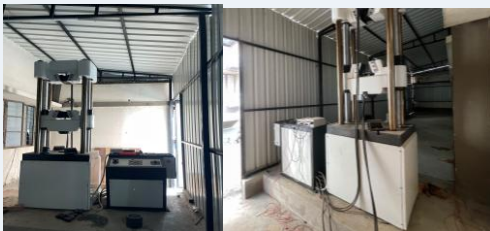
6. Centre of Excellence (CoE) Lab



Key Apparatus: Industrial-Grade FDM & SLA 3D Printers, High-Precision 3D Scanners, Post-Processing UV Curing Chambers, Advanced Slicing & CAD Workstations.

Serves as an advanced innovation hub for additive manufacturing, rapid prototyping, reverse engineering, and hands-on fabrication of complex functional parts.

Universal Testing Machine (UTM) Tensile, Compressive & Mechanical Strength Analysis



Evaluates the mechanical properties and load capacities of engineering materials under controlled hydraulic or electromechanical forces. Students perform standard tensile, compression, shear, and 3-point bend tests to determine yield strength, ultimate tensile strength (UTS), percentage elongation, and fracture behavior.

Lathe Machine (Turning Bay) Cylindrical Turning, Facing & Threading Operations



Rotates the workpiece against single-point HSS or carbide tools to produce symmetrical cylindrical geometries. Students perform facing, step turning, taper turning, knurling, and precision external thread cutting on stepped shaft jobs.

Welding Station (Fabrication Bay)

Electric Arc & Oxy-Acetylene Thermal Fusion



Joins metallic workpieces permanently through localized fusion heat using SMAW electrode arcs and gas torches. Students prepare joint bevels, weld standard Lap, Tee, and single V-Butt joints, and inspect bead penetration.

Milling Machine (Universal Bay) Multi-Tooth Rotary Cutting & Gear Profiling



Employs multi-point rotary cutters (end mills, face cutters, slab mills) moving against fed workpieces. Students execute precision slotting, T-slot milling, surface squaring, and spur gear cutting using mechanical indexing heads.

Grinding Machine (Finishing Bay) Precision Abrasive Machining & High-Tolerance Finishing



Uses high-speed vitrified abrasive grinding wheels for microscopic material removal and mirror surface finish. Students perform flat surface grinding and cylindrical shaft finishing down to tight tolerances (± 0.005 mm).

Shaping Machine (Shaper Bay)

Reciprocating Flat Surface Machining & Keyways



Utilizes a quick-return reciprocating ram with single-point cutting bits across a stationary workpiece. Students learn horizontal and vertical surface leveling, V-grooving, and internal/external keyway cutting on mild steel blocks.

Central Library

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K. N. S. GP SAMASTIPUR

Knowledge Resource Centre & Technical Learning Hub

The Institute Central Library serves as a primary academic knowledge hub equipped with a curated collection of over 10,000 volumes covering all core engineering disciplines. The facility features clearly demarcated branch-wise reading sections, standard reference handbooks, and subscription access to leading technical periodicals and magazines — fostering academic excellence, self-directed research, and intellectual development for both students and faculty.

- **Collection & Volumes:** Houses 10,000+ technical textbooks, curriculum guides, standard reference manuals, and project reports across diploma disciplines.
- **Demarcated Reading Zones:** Dedicated quiet reading bays structured branch-wise to enable focused self-study and peer discussions.
- **Periodicals & Technical Media:** Subscriptions to leading engineering magazines, technical journals, and national dailies to keep students updated with industry advancements.



CAD & Modern Manufacturing Interface

Bridging Digital Design and Practical Manufacturing

The Mechanical Engineering curriculum introduces diploma students to computer-aided drafting and modern engineering drawing conventions. Utilizing the institute's central computing laboratory, students learn to translate technical design concepts into accurate 2D manufacturing drawings and component layouts.

The curriculum connects digital design with practical manufacturing through:

- **Computer-Aided Drafting (AutoCAD):** Preparing standardized 2D orthographic, sectional, and isometric assembly drawings conforming to standard engineering conventions.
- **Machine Component Drawing:** Drafting detailed schematics of machine elements including shafts, couplings, bearings, fasteners, and keyed joints.
- **CNC Programming Fundamentals:** Learning foundational G-code and M-code syntax, coordinate systems, and automated toolpath logic for turning and milling operations.
- **Practical CNC & Shop Execution:** Consolidating digital programming concepts through specialized 14-day residential CNC machining training at CIPET Hajipur.



Manufacturing & Production Technologies

K. N. S. GP SAMASTIPUR

Subtractive & Precision Machining

Conventional Lathe, Milling & CNC Operations



Practical training in turning, facing, threading, shaping, milling, tool geometry, feeds, speeds, and workholding, reinforced through the 14-day CNC machining programme at CIPET Hajipur.

Sheet Metal, Forming & Foundry

Pattern Making, Benchwork & Metal Joining



Hands-on instruction in sheet metal layout development, shearing, notch cutting, bending, and riveted joints. Covers foundry sand mold preparation, pattern making in the carpentry bay, and metal casting fundamentals within the Central Workshop.

Additive Manufacturing & 3D Printing

IIT Patna CoE Hub & Rapid Prototyping



Hands-on training via the Centre of Excellence (CoE) in 3D Printing established in collaboration with IIT Patna under DSTTE, Govt. of Bihar. Students explore FDM additive slicing workflows, CAD-to-STL conversion, and rapid functional prototyping.

■ STUDENTLAURELS // MECHANICAL ENGINEERING

Student Milestones, Training & Achievements

🔧 State Skill Certification — Advanced CNC Machining

Batch: Final-Year Mechanical Engineering Cohort



Awarded official certifications upon successful completion of the intensive 14-day residential training in CNC Lathe & Milling Toolpath Programming, CAD/CAM/CAE, and modern precision manufacturing at CIPET Hajipur (DSTTE & BSDM).

🔧 Heavy Industrial Field Immersion — ECR Loco Shed

Cohort: Mechanical Engineering Technical Delegation



Completed structured industrial training at the East Central Railway Loco Shed, Samastipur, gaining practical exposure to locomotive systems, bogie assemblies, braking systems, and heavy mechanical maintenance.

🔧 Innovation & Entrepreneurship — MSME-DFO Programme

Cohort: Student Innovators & Technical Project Teams



Participated in the Entrepreneurship Awareness Programme (EAP) in collaboration with MSME-DFO Muzaffarpur, presenting technical ideas and receiving mentoring on enterprise development and prototyping.

🔧 Corporate Readiness — Mahindra Pride & Naandi Foundation

Corporate Readiness — Mahindra Pride & Naandi Foundation



Completed professional-competence, workplace-ethics, and aptitude training through Mahindra Pride Classroom, supporting participation in pooled campus drives and recruitment processes with premier employers including GE Aerospace, Maruti Suzuki, L&T, and Jindal SAW.

Major Student Projects & Fabrication

K. N. S. GP SAMASTIPUR

PROJECT 1: Design & Fabrication of 3D-Printed Bionic Arm

Fabricated by: Batch 2020-23



Student Name: Manish Kumar (2020-M-09), Vivek Chandra Singh (2020-M-02)
Devraj Choudhary (2020-M-30), Rahul Kumar (2020-M-25)

The 3D-printed bionic arm was developed as an affordable, lightweight, and customizable assistive prototype. The project demonstrates how additive manufacturing can accelerate prototyping while enabling anatomical customization. The design incorporates actuation mechanisms and electronic components to support functional movement and dexterity.

PROJECT 2: Acrylic 6-Wheel Drive Chassis

Fabricated by: Batch 2023-26



Student Name: Rishi Raj (2023-M-28), Shivam Kumar Singh (2023-M-33)
Ayush Kumar Singh (2023-M-54), Anuradha Kumari (2023-M-43)

Designed as a mobile rover platform for uneven terrain, the six-wheel chassis draw inspiration from rocker-bogie principles to improve stability, traction, and obstacle-climbing capability. The acrylic frame, motor drivers, and microcontroller-based control system provide a practical platform for exploring mobile robotics and mechanical design.

Final-Year Projects & Prototypes

4-Stroke IC Engine Working Model | Power Engineering & IC Engines



Fabricated a working 4-stroke internal-combustion engine model with transparent components and a crankshaft mechanism. A geared DC motor and PWM controller drive the model to demonstrate piston motion and valve timing.

Automatic Smart Irrigation System | Agricultural Automation & Water Conservation



Developed an automated irrigation system that responds to soil moisture conditions to reduce water wastage and manual intervention. Moisture sensors and a relay-controlled 12V pump enable automatic operation when soil moisture falls below a preset threshold.

Steam Generator Engine Setup | Thermal Power & Energy Conversion



Constructed a working benchtop thermal conversion setup using a pressurized canister boiler and burner assembly. High-pressure generated steam is channeled through an impulse nozzle to drive a rotary turbine wheel, converting thermal fuel energy into usable mechanical shaft work.

Double-Leaf Bascule Hydraulic Bridge | Fluid Power & Civil Infrastructure



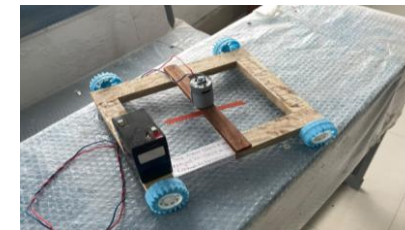
Designed a scaled movable bridge operated by hydraulic actuation based on Pascal's law. Fluid pressure transmitted through actuator pairs enables the bridge leaves to tilt upward, demonstrating hydraulic power transmission and mechanical linkage.

Multi-Axis Hydraulic Excavator Arm (JCB) | Heavy Machinery & Fluid Actuation



Assembled a three-degree-of-freedom articulated excavator-arm model operated through hydraulic pressure. Master-slave fluid pistons control boom elevation, arm reach, and bucket movement, demonstrating the fundamentals of hydraulic actuation.

Automatic Grass Cutter Machine | Agricultural Automation



Developed a compact, battery-powered lawn maintenance tool designed to reduce manual farming labor and operating costs. Mounted on a durable 4-wheel timber chassis, a central high-speed 12V DC motor directly drives an aerodynamic cutting blade, controlled simply through a master onboard rocker switch.

Industrial Visit: Samastipur Railway Workshop (ECR)

Comprehensive Industrial Exposure to Heavy Machining & Rolling Stock

Diploma students of the Mechanical Engineering Department at K. N. S. Government Polytechnic, Samastipur completed an extensive technical field immersion at the historic Samastipur Railway Workshop (East Central Railway, Estd. 1881). The visit bridged classroom machine kinematics with heavy industrial overhauling practices across operational rolling-stock bays.

KEY TECHNICAL AREAS OBSERVED

1. Wheel-Set Overhauling & Pit Lathe Machining

- **Facility Bay: Wheel and Axle Machine Bay**
- **Machining & Inspection:** Observed wheel-tread re-profiling using heavy-duty underfloor CNC pit lathes, along with dimensional inspection, flange-angle checks, and wheel-balancing practices.
- **Engineering Takeaway:** Observed the use of ultrasonic testing (UT), a non-destructive testing method, for identifying subsurface defects in railway axles.

2. Periodic Overhaul (POH) & Bogie Assembly

- **Facility Bay: Freight Wagon & Carriage Overhaul Section**
- **Machining & Inspection:** Observed CASNUB bogie inspection, spring-deflection testing, center-pivot maintenance, and side-bearer clearance checks.
- **Engineering Takeaway:** Observed SAW and MIG welding practices used in structural repair and reinforcement work.

3. Air Brake Testing & Pneumatic Rig Calibration

- **Facility Bay: Brake Equipment & Valve Overhaul Bay**
- **Machining & Inspection:** Comprehensive walkthrough of the twin-pipe graduated-release air brake testing rig, including Distributor Valve (DV) overhauling, reservoir leak checks, and brake cylinder stroke adjustments.
- **Engineering Takeaway:** Understood key fail-safe pneumatic linkages, brake-shoe mechanisms, and emergency-braking sequences used in railway applications.



■ PRACTICALIMMERSION // MECHANICAL ENGINEERING

Summer Internship & Industrial Training Experiences

Diesel Locomotive Shed, Samastipur (ECR)



Deputed Interns (2 Students):

1. OM KUMAR ADITYA (2024-M-56)
2. AMAN KUMAR (2024-M-22)

- **Training Scope:** Completed 4 weeks of hands-on vocational immersion on high-horsepower WDM/WDP diesel-electric freight locomotives at the Samastipur Diesel Loco Shed.
- **IC Engine Maintenance:** Hands-on cylinder head overhaul, valve lash clearance calibration, and fuel injector testing on diesel prime movers
- **Turbocharger Assembly:** Impeller blade inspection, clearance checks, and oil sealing rings replacement.
- **Braking & Transmission:** Air compressor overhauls, dynamic brake grid testing, and traction motor axle-hung bearings inspection.

Sudha Dairy Plant, Barauni (COMFED Bihar)



Deputed Student Cohort:

1. Sakshi Kumari (2024-M-28) 2. Radha Kumari (2024-M-32)
3. Ankit Kumar (2024-M-303) 4. Nikhil Kumar (2024-M-46)
5. Vaibhav Vishal (2024-M-54) 6. Sudha Rani (2024-M-20)
7. Shivam Kumar (2024-M-16) 8. Rakesh Kumar (2024-M-04)

- **Training Scope:** Completed 4 weeks of industrial internship studying thermal utilities, automated packaging, and industrial refrigeration cycles at the Barauni Dairy Plant.
- **Industrial Refrigeration:** Ammonia (NH₃) vapor-compression chilling systems, evaporative condensers, and cold-storage maintenance.
- **Steam & Thermal Generation:** Packaged steam boilers, distribution piping, and plate heat exchangers (PHEs) used in milk processing.

Placement Highlights & Core Recruiters

98% Core Placement (2025) Core Placement & LEET Outcomes Campus selections, apprenticeships, and B.Tech LEET qualification	₹ 5 LPA Highest Reported Package Offered by Maruti Suzuki India Ltd.	₹ 2.4 LPA Average Reported Package Across core automotive manufacturing & plant maintenance	14+ Recruiting Organizations On-Campus, State Pooled Drives & Off-Campus Selections
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Recruiters & Career Opportunities

- **Maruti Suzuki India Ltd.:** Territory Service Engineer (TSE) — highest reported package
- **GE Aerospace:** OJT Trainees
- **Tata Motors & Tata EV:** Vehicle Assembly, EV Systems & Press Shop Operations
- **Larsen & Toubro (L&T Heavy Engg. & Hydrocarbon):** Production & Design Roles
- **MRF Tyres:** Industrial Plant Production & Heavy Polymer Machinery
- **Jindal SAW Limited:** Diploma Engineer Trainee (DET)
- **Endurance Technologies Pvt. Ltd.:** Core Automotive Component Manufacturing
- **Krishna Maruti & Bajaj Auto:** Vehicle Assembly & Powertrain Production
- **Hitachi Astemo Powertrain Systems:** Precision Automotive Systems



Mechanical Alumni Spotlight

K. N. S. GP SAMASTIPUR



RAJA RAM KUMAR
ME
IOCL Barauni
Junior Engineer Assistant IV
(JEA-IV)



ROHIT KUMAR
ME
Eastern Railway
Junior Engineer (JE)



ABHISHEK KUMAR
ME
South East Central Railway
Assistant Loco Pilot (ALP)



SUMIT KUMAR
ME
Bharat Electronics Limited
Engineering Assistant (EA)



SUMIT KUMAR
ME
BEL-GHAZIABAD



AKASH KUMAR
ME
IOCL



ABHISHEK KUMAR
ME
South West Railway
Assistant Track Machine



SAHIL KUMAR
ME
IOCL Barauni
Junior Engineer (JE)



AADITYA KUMAR
ME
Maruti Suzuki India Limited
Territory Service Engineer
(TSE)



SURAJ KUMAR
ME
Jindal SAW
Diploma Engineer Trainee
(DET)



GOLU KUMAR
ME
L&T Hydrocarbon
Designer



KANHAI KUMAR
ME
L&T Heavy Engineering
Production Engineer



AYUSH KUMAR
ME
GE Aerospace
OJT Trainee



PANDAV KUMAR
ME
GE Aerospace
OJT Trainee



AALOK KUMAR
ME
GE Aerospace
OJT Trainee



AASHU RANI
ME
GE Aerospace
OJT Trainee



HANSH RAJ KUMAR SINGH
ME
GE Aerospace
OJT Trainee



SUNNY KUMAR
ME
GE Aerospace
OJT Trainee



SONU KUMAR
ME
GE Aerospace
OJT Trainee



VIKKY KUMAR RANGEELA
ME
GE Aerospace
OJT Trainee

FACULTY RESEARCH & PUBLICATIONS

1. Dr. Aftab Anjum, Principal (Lecturer Mechanical Engg.) – Publications. 2. Dr. Piyush Kumar Pathak (Lecturer Mechanical Engg.)– Publications.

1. Experimental Analysis of the Effect of Shading and Variation of Tilt Angle on Output Power of PV Module Journal: International

Journal of Advanced Production and Industrial Engineering (IJAPIE).|

Details: 2016-10-402, Vol. 1(4), pp. 09-13 (A Blind Peer Reviewed Journal)

2. Performance evaluation of a solar based Brayton cycle integrated vapor compression-absorption trigeneration system for power, heating and low temperature cooling

Journal: Proc IMechE Part C: J Mechanical Engineering Science. Details: Sage (2024), pp. 1–15, DOI: 10.1177/09544062

3. Exergy-energy, economic and environmental evaluations of a solid oxide fuel cell based trigeneration system

Journal: International Journal of Exergy (Int. J. Exergy).| Details: Vol. 47, No. 2 (2025), p. 136

4. Exergy-energy, economic and environmental evaluation of a solid oxide fuel cell based trigeneration system using double effect vapor absorption refrigeration system

Journal: International Journal of Refrigeration. | Details: Elsevier

5. Thermodynamic assessment of a novel solar powered trigeneration system for combined power generation, heating, and cooling

Journal: Proc IMechE Part C: J Mechanical Engineering Science. |

Details: Sage (2024), pp. 1–14, DOI: 10.1177/09544062241230222

6. Thermodynamic, environmental and economic investigation of a solid oxide fuel cell based hybrid power generation system using trans critical CO2 cycle

Journal: Journal of Thermal Analysis and Calorimetry. Details: (2026) 151:6261–6274, DOI: 10.1007/s10973-026-15408-4

7. Thermodynamic assessment of a combined power, heat and cooling cycle in a trigeneration system using low temperature heat source with various eco-friendly refrigerants

Journal: AIP Conference Proceedings. | Details: Vol. 3297, 090001 (2025), DOI: 10.1063/5.0207176

8. Economic Analysis of the Nisargruna Based Bio-Methanation Plant

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Mechanical Engineering Knowledge Corner

THERMODYNAMIC CYCLES • Carnot Cycle: Ideal benchmark; 2 reversible isotherms, 2 isentropic. $\eta = 1 - (T_c/T_h)$. • Otto Cycle: Spark ignition; 2 reversible adiabatic, 2 constant volumes. $\eta = 1 - 1/(r^{(\gamma-1)})$. • Diesel Cycle: Compression ignition; heat addition at constant pressure, heat rejection at const vol. • Rankine Cycle: Vapor power standard for thermal and nuclear power generation boilers.	SOM CORE FORMULAS • Euler's Buckling Load: $P_{cr} = (\pi^2 E I) / (L_e)^2$ • Bending Equation: $M / I = \sigma / y = E / R$ • Torsion Equation: $T / J = \tau / r = G \theta / L$ • Hooke's Law (1D): $\sigma = E \cdot \epsilon$ (Stress proportional to strain) • Factor of Safety: $FOS = \text{Ultimate Strength} / \text{Permissible Stress}$	GD&T TOLERANCES • Flatness ($\square$): All surface elements lie within 2 parallel planes. • Cylindricity ($\mathcal{N}$): Form tolerance combining circularity & straightness. • Perpendicularity ($\perp$): Feature exactly at 90° relative to specified datum. • True Position (+): Allowable deviation from theoretical true location. • Runout ($\nearrow$): Composite variation when rotated 360° around datum.
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CoE 3D Printing & Advanced Mechanical Systems

K. N. S. GP SAMASTIPUR

The Mechanical Engineer's Role in Additive & Advanced Manufacturing

Digital design becomes engineering value only when it is translated into reliable physical components. Mechanical engineering contributes through materials knowledge, process planning, precision toolpaths, thermal considerations, and dimensional quality.

Key Technical Themes in the CoE 3D Printing Ecosystem

- Precision Additive Processing: Additive manufacturing requires controlled process parameters, thermal management, and appropriate build strategies to reduce distortion and residual stresses.
- Generative Design & Topology Optimization: Digital optimization and FEA-based evaluation can support lightweight designs while maintaining required structural performance.
- Advanced Metrology & Reverse Engineering: 3D scanning and dimensional inspection can support rapid geometry capture, deviation analysis, quality control, and prototype validation.



Campus Chronicles & Student Engagement

• Umang (Mechanical Boys Cricket Team)



Inter-department sports championship, cricket tournaments, and annual athletic meets.

• Alumni Meet 2026



Interactive networking and mentorship sessions connecting senior alumni with diploma scholars.

• Teachers' Day Celebration



Departmental felicitation and cultural tribute organized by students honoring faculty mentors.

MECHNOVA 2026

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