



**Yash Gupta**  
**Mechanical Engineering**  
**Indian Institute of Technology Bombay**

**22B2151**  
**B.Tech.**  
**Gender: Male**  
**DOB: 18/10/2004**

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2026	
Intermediate	CBSE	Tagore International School	2022	96.20%
Matriculation	CBSE	Tagore International School	2020	98.20%

Pursuing a Minor Degree in the Department of **Electrical Engineering** at IIT Bombay

## SCHOLASTIC ACHIEVEMENTS

- Achieved a **99.17** percentile in **IIT-JEE Advanced** outperforming over **0.15 Million** candidates [2022]
- Attained a **99.82** percentile in **IIT-JEE Mains** amongst a cohort of over **1 Million** candidates [2022]
- Amongst the **top 1** percent in **KVPY SX 2022 (AIR 1943)** out of **0.2 Million+** candidates [2022]

## PROFESSIONAL EXPERIENCE

**E-Trnl Energy Pvt. Ltd.** | Mechatronics Engineer | *Machine Design Intern* [May'24 - Jul'24]

*Pioneering a revolutionary cell design named **3DEA**, a concept that eliminates battery heating at the source*  
*Awarded a **Letter of Recommendation** for exemplary work in designing an extruder model for roll press*

- Ideated, designed, and manufactured the **automation** and **extruder** components for a roll press, to serve the purposes of **electrode fabrication**, minimizing **material losses** and providing **calendaring**
- Optimally incorporated a **NEMA 34**, a **CSD 1008E**, and a **die case** assembly into the extruder model
- Researched and developed the **ladder logic** for effectively controlling a **FX5U-32MT/ESS PLC** in the final roll press system, integrating 3 momentary switches, a 3-position button, and **2 proximity sensors**
- Programmed the Arduino Uno to control multiple **stepper motors** across **8+** different **press stations**

## TECHNICAL PROJECTS

**Variable Power Supply** | Electronics and Robotics Club

[Oct'23-Mar'24]

- Designed and developed a power supply providing precise voltage (**0-30V**) and current (**0-5A**) outputs
- Ensured accurate performance by incorporating a **36V SMPS**, **XL4016** buck module, and various **ICs**
- Created a comprehensive circuit diagram including **overcurrent protection** and fabricated the **PCB**
- Arranged for **CPU fans**, digital displays, and **potentiometer** knobs using laser cutting and 3D printing

**Analysis of Jansen's Linkage** | Course Project | *Guide Prof: V. Kartik*

[Mar'24-May'24]

- Designed and simulated Jansen's linkage leveraging SolidWorks with **motion analysis** for precise modelling
- Integrated **IMU** on output link using **MPU 6050** and Arduino UNO to log velocity and acceleration data
- Conducted in-depth analysis of IMU-logged data using **FFT** and windowing(**Hann function**) in MATLAB
- 3D printed a **DC motor** driven prototype and compared the results with simulation achieving **50%** precision

**SCARA** | Industrial Robot | Electronics and Robotics Club

[Nov'23-Jan'24]

- Engineered a **SCARA manipulator** utilizing SolidWorks and fabricated it through **rapid prototyping**
- System navigated an **optimized path** in an obstacle-laden 3D space employing **path planning** techniques
- Researched and applied the **RRT\*** algorithm on the manipulator using **Simscape** in MATLAB
- Implemented the **inverse kinematics** principles and programmed the solution using **Raspberry Pi 4B**

**Bauschinger Effect** | Course Project | *Guide Prof: Nitesh Yelve*

[Sep'23-Nov'23]

- Demonstrated and inspected the **Bauschinger effect** in a steel specimen subjected to a **cyclic loading**
- Pioneered the crucial setup employing a hydraulic **UTM** and tailored the dimensions of a steel specimen
- Graphed the Engineering Stress vs Engineering Strain curve and made comparative graphical analysis
- Established a significant **8% reduction** in the compressive yield strength for an **ASTM E8** steel specimen

**Humanoid Bot** | Electronics and Robotics Club

[Feb'24 - Apr'24]

- Designed the **CAD** model of a humanoid robot using **SolidWorks** and fabricated it through 3D printing
- Incorporated **16 DoFs** in the robot with help of high-torque **servo motors**, enabling complex movements

Predictive Maintenance | Course Project | *Guide Prof: Alankar Alankar* [Feb'24 - May'24]

- Conducted **vibrational analysis** and predictive maintenance of prolonged used-**ball bearings** dataset
- Extracted the time domain, frequency domain, and **spectral features** for **pre-processing** of the data
- Utilized Gradient Boosting (k-score: **86%**) and Extreme Gradient Boosting (k-score: **87.8%**) classifiers
- Identified the **inner race** and **stage 2** failures as the highest probabilities through statistical analysis

Graphene-Based Composites | Course Project | *Guide Prof: Pradeep Dixit* [Aug'23 - Nov'23]

- Led a team of 5 to investigate graphene-based composites' applications in polymer-based **nanocomposites**
- Delivered a **20-minute** seminar presentation, highlighting the future role of graphene in **supercapacitors**

Customized Food Solutions | Course Project | *Guide Prof: Nishant Sharma* [Jan'24 - Apr'24]

- Developed a prototype of an app using **FIGMA** implementing **Snap & Track & Ask a Dietician** features
- Conducted empathetic **interviews** with hostel students leveraging continuous **user feedback** for the app
- Effectively **pitched** the app to a highly **experienced panel**, demonstrating its utility and value proposition

IMU Controlled Monster Truck | Electronics and Robotics Club [Aug'23 - Sep'23]

- Engineered a **suspension bot** featuring adaptive **ground clearance**, with a compact frame and chassis
- Configured an **ESP01** to establish communication with a **ESP32** module using the **ESPNOW** protocol

POSITIONS OF RESPONSIBILITY

Institute Technical Convenor | *Electronics and Robotics Club, IIT Bombay* [Jun'23 - Mar'24]

Part of a **10-member team** organising **20+ events** promoting **E & R** for over **8000 enthusiasts**

- Organized **XLR8**, the institute's premier technical event, overseeing **850+** freshmen in a **bot-making competition** and additionally delivered a lecture titled "**Get Mechanized**" to educate **350+** freshmen
- Organized the **Frosty Winter Workshop**, drawing **300+ attendees**, instructing on **ROS2** and **Gazebo**
- Conducted the "**Hello Robot**" workshop, instructing over **150** students in creation of a **robotic arm**
- **Anchored** a **bot-fight** competition comprising of 5 rounds for over **300** undergraduate new entrants

Department Academic Mentor | *Student Mentorship Program, IIT Bombay* [Jun'24 - Present]

- Selected as a part of **43** member team through rigorous interviews and peer reviews out of **150+** applicants
- Mentoring **6 sophomores** in academic, personal, extra-curricular pursuits, and conducting **help sessions**
- Curating the Department Introductory Handbook comprising of career and academic related information

Mentor | ITSP | *Institute Technical Council, IIT Bombay* [May'24 - Jul'24]

- Mentored teams as a **technical mentor**, assisting in mechanical design reviews and components selection

TECHNICAL SKILLS

- **Programming Languages** : Python, Ladder Logic, C, C++, LaTeX
- **Softwares** : Fusion 360, SolidWorks, Arduino IDE, MATLAB, GS Works, Easy EDA
- **Manufacturing Processes** : Milling, Lathing, Welding, Laser Cutting, 3D Printing, CNC, Drilling

KEY COURSES TAKEN

Mechanical Engineering Courses	Kinematics and Dynamics of Machines, Solid Mechanics, Fluid Mechanics, Structural Materials, Mechanical Processing of Materials, Thermodynamics
Mathematics Courses	Calculus I and II, Linear Algebra, Differential Equations

EXTRACURRICULAR ACTIVITIES

Scholastic	<ul style="list-style-type: none"><li>• Earned the <b>Shri Deepak Rathore Memorial</b> award for 1st position in <b>AISSCE</b></li><li>• Recipient of the <b>Gold medal</b>, for securing <b>1st rank</b> in school in the <b>SOF NSO</b></li></ul>
Culturals	<ul style="list-style-type: none"><li>• Secured the <b>1st Prize</b> in the Instrumentals category at the <b>Mechanical Cult Night</b></li><li>• Ranked in <b>top 8</b> bands out of 30 in the <b>BOTB 2K24</b> showcasing musical excellence</li><li>• Achieved the <b>1st Prize</b> in <b>Hostel 1 Fest-Carnival</b> highlighting my guitar talent</li><li>• Pursued an yearlong training in <b>Instrumental Violin</b> under the NSO</li></ul>
Social	<ul style="list-style-type: none"><li>• Conducted a 2 day workshop with <b>GnaanU</b> teaching underprivileged students how to build bots</li></ul>