Sanskrati Agarwal

Junior Undergraduate
Department of Mechanical Engineering

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Academic Qualifications

Year	Degree/Certificate	Institute	Performance
2023-Present	B.Tech	Indian Institute of Technology Kanpur	7.0/10
2023	Class XII (CBSE)	Dr Lokmandas Public School, Etah	95.8%
2021	Class X (CBSE)	Assisi Convent School, Etah	98.8%

Major Achievements

- Secured **1st** position in **Formula Bharat 2026 Rulebook Quiz** in the **EV category** among **40+** FSAE teams in India
- Secured **All India Rank 6787** in the **Joint Entrance Exam Advanced 2023** among **1.8 lakh** shortlisted candidates
- Secured **All India Rank 4635** in the **Joint Entrance Exam Mains 2023** conducted by **NTA** among **11.2 lakh** applicants
- Qualified for **Stage - II** in **National Talent Search Examination** (NTSE) among **10 lakh+** candidates in India
- Secured **State Rank 3** in **UP Genius 2017** as the youngest finalist from Class **6**, competing with students up to Class **12**

Key Projects

○ **Personal Portfolio Website** (Self Project) 🔗 *(Mar'25-Apr'-25)*

- Developed an interactive portfolio website showcasing personal projects, achievements, and skills using HTML, CSS, and JS
- Designed intuitive UI/UX with **AOS** (Animate On Scroll) effects, **custom cursor animations**, and **gradient typography**
- Implemented features like **theme toggling**, **audio control**, **animated text intro**, and **smooth navigation transitions**

○ **YouTube Analytics and Content Trends** (Finlatics Data Science Program) *(Dec'24-Feb'25)*

- Utilized **NumPy** and **Pandas** in **Python** to analyze YouTube data and extract meaningful patterns across multiple trends
- Created visualizations by using **Matplotlib** to discover trends like subscriber growth and channel creation patterns over time
- Built **Python scripts** to analyze data from scratch - gaining hands-on experience in working with real-world messy datasets

○ **Quadrotor Dynamics Simulation** (Mentor: Prof. Dipayan Mukherjee | IIT Kanpur) *(May'25-Present)*

- Conceptualized complete set of **ODEs** for a quadrotor system, by incorporating thrust, drag, torque, and aerodynamic effects
- Implemented **MATLAB** simulations to model **Vertical takeoff and landing** (VTOL) behavior of the quadrotor system
- Analyzed real-time flight trajectories, incorporating all lift forces in order to determine the equilibrium **hover conditions**

○ **Formula Student Electric | IITKMS** (Advisor: Prof. Amarendra Edpuganti | **Budget: INR- 37 Lakhs**) *(Apr'24-Present)*

- Designed a **dual-motor** rear-wheel-drive system with integrated **torque vectoring** model and **planetary gearbox** system
- Optimized **gear ratios** using **MATLAB** and **OptimumLap** to achieve a balance between **acceleration** and **peak speed**
- Selected **motor, motor controller**, and **components** using **co-factor matrix** consisting of weight, cost, and performance
- Designed **powertrain assembly** ensuring robust motor mounting, efficient power transmission, and integration with chassis

○ **Planetary Gear Design | IITK Motorsports** (Advisor: Prof. Amarendra Edpuganti) *(May'25-Present)*

Objective	• To design a **compact** and **lightweight Planetary Gearbox** for an electric drivetrain **dual motor setup**
Approach	• Calculated optimal number of **teeth** and **face width** for sun, planet and ring gears using **MATLAB** scripts • Performed **topological optimization** and **Finite Element Analysis** for enhanced **structural efficiency**
Result	• Designed **final gearbox** with weight under **3.5 kg** and with **Factor of Safety** of **2.4** validating its robustness

Positions of Responsibility

○ **Senior Technical Member (Powertrain) | IITK Motorsports** *(Mar'25-Present)*

Leadership	• Mentored **6** junior team members, transferring **design knowledge** of components in the powertrain subsystem • Collaborated in team's **brainstorming sessions** to ensure efficient **project planning** and **management**
Management	• Organized **written test** and **shortlisting interviews** for the **recruitment** of **44 junior team members** • Instilled a **documentation strategy** which helps **organise team resources** for the **long-term benefits**
Impact	• Led **introductory session** and **FSEV showcase**, engaging **450+** freshmen, the highest audience in **3** years • Received **250+** student applications from the freshers batch during the **team recruitment** for term 2025 • Initiated and led the integration of planetary gearbox in our **EV** for the very **1st** time in the **team's history**

○ **Secretary | Chess Club, IIT Kanpur** *(Jun'24-May'25)*

- **Authored** informative **articles, emails, and social media posts** promoting chess events across the campus community
- Led registration for **80+** teams pan India for the **India Collegiate Chess Championship Fall 2024**, hosted by **Chess.com**
- Coordinated **Chess Master Premier League** (CMPL) which attracted **5000+** participants from **80+** colleges across India

Technical Skills

- **Languages & Libraries**: C, C++, Python, SQL, LaTeX, HTML, CSS, Javascript, Matplotlib, NumPy, Pandas

Relevant Courses

Fundamentals of Computing	Introduction to Electronics	Complex Variables
Linear Algebra	Partial Differential Equations	Single and Multi Variable Calculus

Extra-Curricular Activities

- Secured **3rd Rank** in Uttar Pradesh among **1000+** candidates in the Inter-State **Anuvrat Essay Writing Competition**
- Secured **Gold Medal** in **Chess** at **Inferno**, the **Inter-Hall competition**, among **30+** participants from different batches
- Awarded by the **District Magistrate** every year from class **I to IX** for maintaining **top academic rank** across 4 sections