GOPIKA SIVANI K S

Fourth Year Dual Degree Student | Aerospace Engineering

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Academic Qualifications

Year	Degree/Certificate	Institute	CPI/%
2022 - Present	B.Tech-M.Tech	Indian Institute of Technology, Kanpur	**8.5**/10.0
2021	XII (Board of HSE, Govt. of Kerala)	Govt. HSS, Makkaraparamba, Malappuram	**99.5**%
2019	X (Board of PE, Govt. of Kerala)	Malabar Special Police EMHS, Malappuram	**100**%

Academic Achievements

- Secured **Engineering Rank 238** and **Pharmacy Rank 154** in **KEAM** amongst **75K+** candidates (*2022*)
- Recipient of the **Best Outgoing Student Award** - Malabar Special Police EMHS, Malappuram (*2019*)
- Ranked among **top 10** in Kerala **Mathematics Talent Search Examination** for three consecutive years (*2016-2018*)

Research Experience

Mentor: Dr. Abhishek | Dept. of Aerospace Engineering, IIT Kanpur

Development of Novel Low-Noise Hoop Propeller for UAVs | | SURGE Internship | IIT Kanpur (*May'24-July'24*)

Objective	Develop a **novel** propeller system to reduce UAV **Blade Vortex Interaction** noise, meeting urban regulations and mission needs while improving efficiency, minimizing acoustic impact, and enabling wider use in noise-sensitive areas
Approach	Reviewed existing concepts of **toroidal** and **biplane-wing configurations**, evaluated multiple airfoil profiles, and led the full development process including iterative **CAD modelling**, **3D printing** and **experimental testing**
Impact	Delivered a hoop propeller design that generated over **twice the thrust** of standard 12×6 APC propellers and matched the performance of 13×8 models, demonstrating significant gains in **propulsion efficiency** and UAV **payload capacity**, with ongoing refinement targeting further acoustic performance gains for cost-effective deployment

Relevant Projects

Investigation of the Effects of Stagger and Box-Wing Configurations on the Aerodynamic and Acoustic Performance of Hoop Propellers | Mentor: Dr. Abhishek | Dept. of Aerospace Engineering | IIT Kanpur (*May'25-Ongoing*)

- Designed a **staggered** hoop propeller with a **CLARK-Y** airfoil and compact hub, based on comprehensive studies of biplane and **box-wing** arrangements to evaluate the influence of geometric variations on aerodynamic and acoustic characteristics

ESG News Sentiment and Trend Analyser | | Self Project (*June'25*)

- Scraped **1000+ ESG** headlines from **news** sites like Bloomberg using Python, applied **TF-IDF** and **logistic regression** for **sentiment analysis**, and visualized trends such as **top** keywords, source **bias**, company mentions, and **trend volatility**

COVID-19 Data Exploration and Global Impact Analysis | | Self Project (*May'25*)

- Built a complete COVID-19 data pipeline by extracting and transforming global records using **SQL** techniques such as **CTEs**, **Temporary Tables**, and created **Tableau Dashboards** to communicate key insights on global trends and regional impact

Transition to Turbulence in Boundary Layer | | Course Project | AE-312 | Prof. Pradeep Moise (*April'25*)

- Conducted a comprehensive review of transition to turbulence in boundary layer, mechanisms, instabilities, and BL seperation

Automating Crypto Website API Pull Using Python | | Self Project (*December'24*)

- Automated **API pulls** from CoinMarketCap using Python, enabling scheduled retrieval of cryptocurrency market data including prices, supply, and **percentage change** over time, with structured CSV exports and **visualizations** to monitor pricing trends

Credit Card Financial Dashboard using Power BI | | Self Project (*December'24*)

- Built a complete COVID-19 data pipeline by extracting and transforming global records using **SQL** techniques such as **CTEs**, **Temporary Tables**, and created **Tableau Dashboards** to communicate key insights on global trends and regional impact

Optimal Fault-Tolerant CMGs | | Course Project | AE-642 | Prof. Dipak Kumar Giri (*November'24*)

- Analyzed and applied CMG configuration optimization methods for actuator failure tolerance, including Thomson's **energy potential** approach, body-fixed frame weighting, **reliability-based weighting**, and **zero-momentum** condition strategies

Automatic Opening Bridge and Vehicle Barrier System | |Course Project|TA212|Prof. Niraj Sinha (*March'24-April'24*)

- Engineered an automated **split bridge** with **synchronized barriers** that sense incoming ships and coordinate movement, using **IR sensor**, Arduino control, and **gear mechanisms**, with components produced on **lathe**, **milling**, and **drilling** machines

Cable Car | | Course Project | TA211 | Prof.Sudhanshu Shekhar Singh (*October'23-November'23*)

- Designed a cable car prototype using **mild steel**, using manufacturing techniques including **casting**, **bracing**, and assembly

Positions of Responsibility

Academic Department Mentor, Academic and Career Council, IIT Kanpur (*July'24-July'25*)

- Mentored over **70 department undergraduate juniors** in collaboration with the UG Academics Wing, offering structured academic support on coursework, template, project planning, and study strategies fostering a supportive academic environment
- Led **departmental mentoring sessions** and **one-on-one interactions** to address student concerns, disseminate academic resources, and coordinate with faculty, TAs, and departmental representatives for timely resolution of academic concerns

Senior Team Member, Rocketry and Space Exploration Team (RaSET), IIT Kanpur (*April'24-April'25*)

- Contributed to **Project June** - one of **India's most powerful student-built rocket motors** (**2700 N** thrust, **2500 N·s** impulse) - and other minor builds, with hands-on roles in recovery system design, static fire testing, and system integration
- Managed **logistics**, **merchandise**, social media, and website content for **documentation** and **outreach**, while mentoring **20+** junior members through regular reviews, **technical** discussions, and **workshops** for competitions such as **IN-SPACe CanSat**

Student Guide, Counselling Service IIT Kanpur (*July'23-July'24*)

- Assisted incoming freshmen with a smooth transition into college life by offering consistent personal support and guidance, while actively contributing to the execution of a **10-day orientation** program covering academic, social, and campus-related aspects

Academic Mentor, Counselling Service IIT Kanpur (*July'23-July'24*)

- Mentored a batch of **1200+** students by conducting structured **academic sessions** and offering personalised **one-on-one guidance**, addressing challenges related to coursework, exam preparation, academic planning, and their overall academic progress

Technical Skills

- C, C++, Python, MATLAB, LaTeX, SQL, Excel, Tableau, Power BI, Fusion 360, AutoCAD, Canva

Relevant Coursework

Fundamentals of Computing	Single Variable Calculus	Linear Algebra
Ordinary Differential Equations	Partial Differential Equations	Complex Variables
Manufacturing Processes	Mechanics of Solids	Fluid Mechanics and Rate Processes
Compressible Aerodynamics	Compressible Aerodynamics	Thermodynamics
Flight Mechanics	Aircraft Control Systems	Aerospace Propulsion
Shear Flow	Satellite Attitude Dynamics	Aerospace Structures
Dynamics	Introduction to Electronics	Basics of Modern Control System
Experiments in Aerospace Engineering	Incompressible Aerodynamics	Inorganic and Organic Chemistry
Introduction to Management	Introduction to Indian Philosophy	Art Criticism: Theory and Practice

Extra-Curricular Activities

Social	• Conducted a **musical workshop** for **30+ underprivileged children** in collaboration with **Prayas IITK** • Served as a **Student Police Cadet**, taking part in **charity** and **outreach** activities and led the **Independence Day parade** as the **Platoon Commander**, and represented the school at the Malappuram **District Camp** 2017
Cultural	• Secured **A Grade** in Bharatanatyam, Mohiniyattam, Kuchipudi, and Violin at **Kerala Kalolsavam** (2017–2020), backed by **8** years of formal training in **4 Indian Classical Dance forms** and **5** years in **Carnatic Violin**
Technical	• Secured **3rd place** in the **SpaceX Starship Hackathon** for proposing a novel satellite constellation idea • Completed Forage job simulations with **GE Aerospace**, **BCG**, **Accenture** and **TCS**, gaining exposure to **propulsion systems**, **carbon dioxide** emmision, alternative **energy sources**, GenAI chatbot development, **financial data** analysis, **ESG** consulting, and **strategic problem-solving**
Managerial	• Coordinated cultural events as an Executive member of the **Malayalam Vaedi community** at IIT Kanpur • **School Leader**, and led a student body of **500+** members at Malabar Special Police EMHS from 2017–2018