SAYANTANI MODAK

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CAREER OBJECTIVE

Enthusiastic and self-motivated 3rd-year Mechanical Engineering student at IIT Bhubaneswar. Seeking an internship opportunity to apply and expand my knowledge in interdisciplinary problem-solving, mechanical systems, experimental studies, computational simulations. Passionate about aerodynamics, CFD, thermal systems, interested in contributing to impactful engineering solutions.

EDUCATION

Bachelor of Technology in Mechanical Engineering | Indian Institute of Technology Bhubaneswar (2023 – Present)
CGPA: 8.04/10.0 , SGPA: 8.96/10.0 (5th Sem)

Relevant Coursework- Fluid Mechanics, Thermodynamics, Heat Transfer, Machine Design, Transducers, Sensors & Measurement, Introduction to Programming & Data Structures, Basic Electronics, Theory of Machines, Solid Mechanics

TECHNICAL SKILLS

Programming Languages: Python, C, MATLAB, MySQL, HTML

Simulation & Modelling: CAD, ANSYS, Simulink, Finite Element Analysis (FEA)

Data Analysis & Libraries: Pandas, NumPy, Matplotlib, NumPy, SciPy | Hardware & Prototyping: Arduino

Version Control & Documentation: GitHub, LaTeX

CERTIFICATIONS & COURSES

- Google Advanced Data Analytics Specialization, Coursera (2024)

  Certificate Link: https://coursera.org/share/1c6c869cf9ab3d6a84d348fb7081f968
- Mastering ANSYS with Finite Element Analysis & CFD, Udemy (2025)

  Certificate ID: UC-a70d2bd8-7157-44b0-9ed0-7fa5381e85d8

ACADEMIC PROJECTS

Vibro-Acoustic Metamaterial (VAMM) based resonators |Academic Project (under Dr. Soumya Ranjan Sahoo, Asst Prof., SMS, IIT BBS) | Mar 2025 – Jun 2025

- Modelled varied design unit cells of acoustic metamaterials resonators in MATLAB and ANSYS, analysed dispersion characteristics and vibration attenuation through frequency response simulations, simulated wave propagation characteristics to validate band gap predictions, Explored potential applications of metamaterials in vibration isolation systems.

Cranial Implant Robot for Robot-Assisted Surgery | AI and Mechatronics Lab | Nov 2024 – Mar 2025

- Co-developed a robotic prototype assisting in cranial implant surgeries, Designed CAD models and integrated control algorithms

ML Model for estimation of RUL of turbojet engines | Academic Project

- Developed a physics-informed explainable ML model using multi-sensor turbofan engine CMAPPS datasets for fault detection and remaining useful life (RUL) prediction. The project integrates domain-based physics constraints with deep learning to enhance model interpretability and reliability for next-generation engine health monitoring systems

Astrophysics Data Analysis — Summer School Project | ISA Summer School Project | Jun 2025 – Jul 2025

- Processed JWST MIRI data cubes using various Python libraries, Automated spectral line identification and flux visualization for galaxy NGC 7469 using Jupyter Notebook, Presented findings in an interdisciplinary research environment.

EXPERIENCE

IIT Indore |Undergrad Intern (under Dr. Harekrishna Yadav, Prof., Mechanical Dept., IITI) | Nov 2025 – Dec 2025

- Assisted in ongoing experimentation in experimental fluid dynamics lab, IITI on “Impact on cooling using various synthetic jet orifice configurations”
- Data acquisition, analysis and visualisation
- Designing and 3d printing of lab setup parts
- Skills- Fusion, MATLAB, Thermal imaging, 3D printing

POSITIONS OF RESPONSIBILITY

- Member, Mechatronics lab, IIT Bhubaneswar (2024 – Present)
- Member, Kalakriti Fine Arts Society, IIT Bhubaneswar (2024 – Present)

ACHIEVEMENTS & AWARDS

- Recognized for research presentation on PCM-Based Thermal Management, Institute Seminar (2024)

  Awarded Ex grade for reviewing a phase change material-based approach for spacecraft thermal management.
- Successfully Completed Summer School on Astrophysics, Indian Science Academy (ISA), India (2025).
- Successfully Completed Summer Training in Remote Sensing & GIS

  Indian Space Academy (Department of Space Education), (2025)
- Selected for Final Round, NSSC Case Study Competition, IIT Kharagpur (2023)

  Advanced to the 2nd round in the National Students' Space Challenge case study contest based on aerospace systems.
- Completed Aeromodelling Workshop, Wissenaire TechFest, IIT Bhubaneswar (2024)

  Designed, fabricated, and successfully flight-tested a remote-controlled (RC) plane

EXTRACURRICULAR & INTERESTS

- Kalakriti, Fine arts society, IIT Bhubaneswar (2024 – Present)
- Languages: English, Hindi, Bengali (Native), French [B1], Japanese [N5]