

# Tufel N Malek

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Anand, Gujarat, India

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## Work Experience:

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### Physics Laboratory In – charge

| May 2025 – Present

FG Education, Knowledge High School Nadiad, Kheda, Gujarat.

Serving as Physics Laboratory In – charge with comprehensive academic and technical expertise in higher secondary Physics education. Conduct and supervise laboratory sessions, ensuring accurate execution of experiments, proper data analysis, and systematic record maintenance. Oversee the overall management of laboratory operations, including inventory control, calibration, maintenance, and safe handling of scientific instruments and apparatus. Ensure compliance with laboratory safety standards and institutional guidelines. Provide academic support and technical guidance to students to strengthen conceptual understanding, analytical skills, and scientific temperament.

## Education:

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Bachelor of Science Honours Physics

(June 2019 – April 2022)

First class with distinction (CGPA: 8.08/10.00)

Department of Physics

P. D. PATEL INSTITUTE OF APPLIED SCIENCES

CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY (CHARUSAT),

GUJARAT

Master of Science in Physics – Computational Physics

(June 2023 – April 2025)

Department of Physics

SARDAR PATEL UNIVERSITY, GUJARAT

## Research Experience:

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### “Computational Analysis of Variational Quantum Eigensolver for Molecular and Ionic Systems”. [March 2025 – present]

Conducted an in-depth computational study on the Variational Quantum Eigensolver (VQE) algorithm, analyzing its efficiency over multiple parameters for molecular and ionic systems. Simulated quantum computing approaches to determine ground-state energies of hydrogen molecules, leveraging quantum circuit optimization and parameter tuning techniques.

### “Computational Study of Form Factors and Branching Fraction Calculations in Semileptonic Bs Decays”. [February 2025 – Present]

Conducting a computational analysis of form factors and branching fraction calculations in semileptonic decays within the Standard Model framework of the covariant confined quark model. Reproducing existing research results by computing transition form factors over the full dynamical range of momentum transfer squared, incorporating infrared confinement. Comparing computed decay width ratios and differential decay distributions with experimental

data from LHCb and lattice QCD simulations. Further analysis includes forward-backward asymmetry and lepton polarization observables in the final state.

**“Quantum Machine Learning for Hydrogen Atom”** [ December 2024 – January 2025]

During a Quantum Computing and Machine Learning workshop, I worked on predicting hydrogen atom energy levels and wavefunctions using Quantum Machine Learning (QML) techniques like Variational Quantum Algorithms (VQAs). A quantum circuit was trained to approximate eigenstates, demonstrating the potential of quantum computing in solving quantum mechanical problems, especially for complex systems beyond analytical solutions.

**“Mass Spectra of four quarks state or tetraquarks state ( $bq\bar{b}\bar{q}$ ) using Lorentz’s structure vs relativistic consistency of an effective power-law potential model for quark and antiquark system”.** [JUNE 2021 – APRIL 2022]

Research Project Area: High Energy Physics and Particle Physics

Project Supervisor: DR. MANAN SHAH

PDPIAS, CHARUSAT University, Anand, Gujarat

**Relevant Research skills**

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Programming knowledge in languages such as C, Python, Fortran, Mathematica.

Proficient in LaTeX, Microsoft word, PowerPoint, and outlook.

**WORKSHOPS/ SEMINARS Attended**

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**“Quantum Computing: Circuit, Algorithms and Machine Learning (QuCAM)”**

Organized by National Institute of Technology – NIT Rourkela, Odisha, India. 24th of December 2024 to 02nd of January 2025

**“One Week Workshop on Interdisciplinary Computing in Basic and Applied Science with Python Open-Source Software”.**

Organized by Sardar Patel University (Gujarat), Sardar Vallabhbhai National Institute of Technology (Gujarat) and Mathtech Thinking Foundation (Punjab). 9th of December to 15th of December 2024

**“Computing Calculus with Python”.**

One Day workshop Conducted on 23rd of December 2024 Organized by MathTech Thinking Foundation, Punjab, India as a tribute of the unparalleled contribution of Srinivasa Ramanujan to the field Mathematics.

**“Quantum Information and Quantum Technology 2022”.**

Collaboration with IISER-K, QuEST and Department of Science and Technology (DST) Government of India. 1ST of June to 5th of July 2022

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (IISER), KOLKATA, WEST BANGAL, INDIA.

**GUJCOST Sponsored International Webinar on “Exploring Wonders Through Advance Instruments”.**

1st February to 4th February 2021 DR. K. C. PATEL RESEARCH AND DEVELOPMENT CENTRE, CHARUSAT, Changa – 388421, Gujarat, India.

**Participated in the lecture on “Why Can’t Time Run Backward?”**

by Prof. Anthony J. Leggett, Noble Prize Winner in physics 2003 as part of noble laureate lecture series on 8th October 2020. Postgraduate and Research Department of Physics, Mar Athanasius College (Autonomous), Kothamangalam, Kerala, India.

**Participated in the workshop on the “Semiconductor Ecosystem and VLSI Technology”. (August-23-2023)**

Organized by Department of Physics, Sardar Patel University, Anand, Gujarat.

**Personality Development Workshop (one Week workshop), 2014**

ST. MARY’S HIGH SCHOOL, KHEDA, GUJARAT, INDIA.

**Academic Achievements and Certification:**

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- Secured 7th position in the Quiz competition on International E-waste Day organized by Jaipur National University, Jaipur, Rajasthan, India.
- Successfully completed Evolution Quiz on Darwin Day with Score of 100% marks - 12th February 2025
- Successfully completed Wings Quiz on National Birds Day with Score of 100% marks - 05th January 2025
- Science Exhibition (Districts level), Knowledge high school, Nadiad, Gujarat (2015)
- Quiz Competition 2015-16 Ramakrishna Mission Vivekanda Memorial, Vadodara, Gujarat. Debate completion 2014-15 Roman Catholic Mission School, Kheda, Gujarat.

**Membership of Professional Societies**

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I served as a Discipline Committee Member at Physical Society, Department of Physics, Sardar Patel University from July 2023 to April 2024. In this role, I played a vital part in maintaining campus discipline and upholding the code of conduct among students. I actively resolved conflicts, conducted disciplinary hearings, and organized awareness campaigns to promote ethical behavior. By fostering open communication with students and staff, I contributed to maintaining a positive and respectful learning environment throughout my tenure.

**Other Activities**

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Senior Invigilator and Exam grader and Teaching assistant (April 2023 – June 2023)

Mirror Institute, Nadiad, Kheda, Gujarat.

Made sure exams ran smoothly and that student follows rules.

Checked and marked exams, giving students helpful feedback to improve.

Worked with a team of people to create a friendly and supportive place for learning.

Last updated on 12 February 2026

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