

భారతీయ సొంకేతిక విజ్ఞాన సంస్థ హైదరాబాద్
भारतीय प्रौद्योगिकी संस्थान हैदराबाद
Indian Institute of Technology Hyderabad



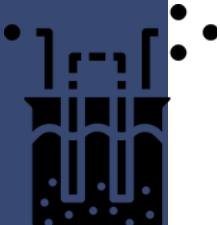
ENERGY SCIENCE AND TECHNOLOGY

SHAPING THE FUTURE OF
ENERGY

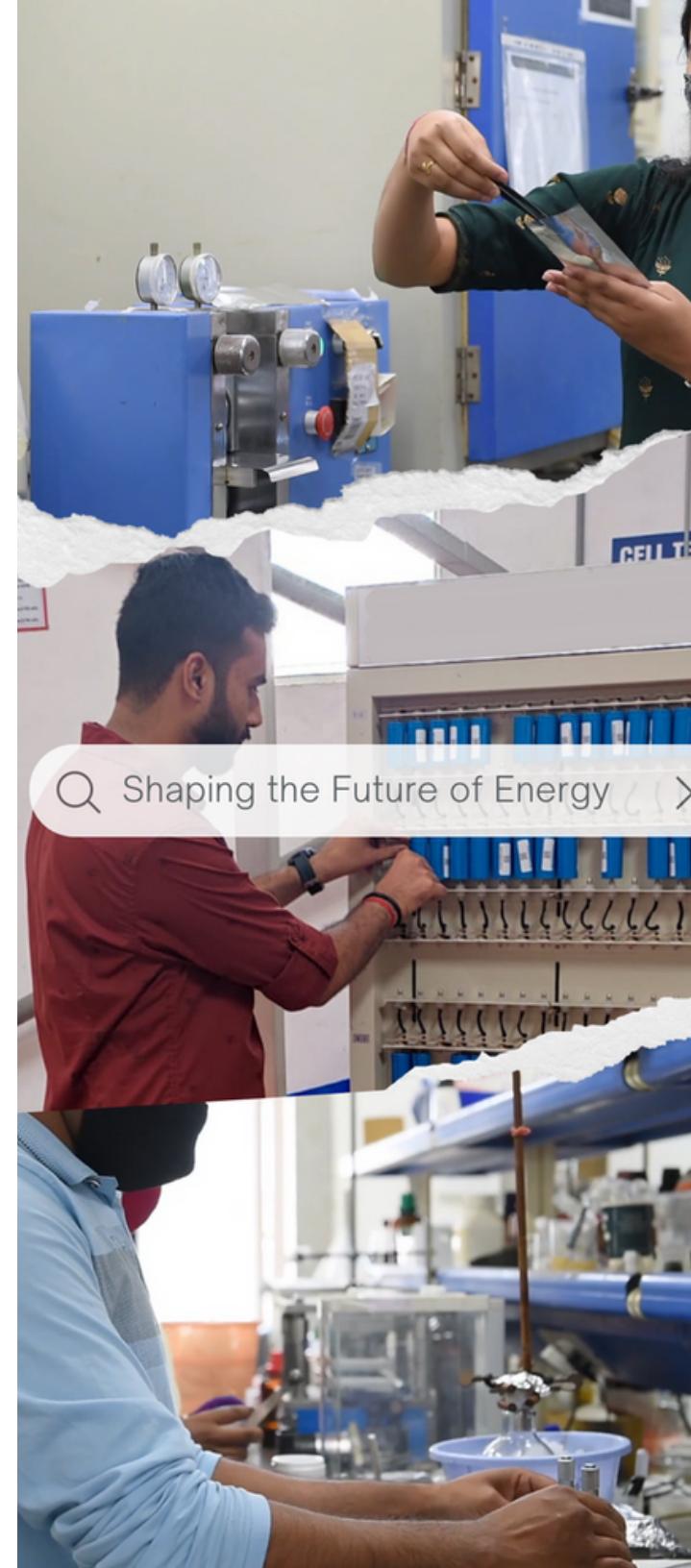
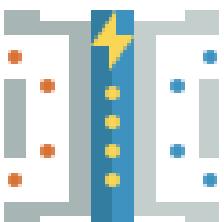
Placement Brochure
2022-2023



WHY HIRE FROM ENERGY SCIENCE & TECHNOLOGY



- Students from different backgrounds, ensuring grip over fundamentals of mathematics, electrical, electronics, and mechanical.
- Diverse curriculum which is completely based on industry perspective.
- Trained in a wide range of trending energy sources like Bioenergy, Hydrogen energy, photovoltaic system, etc., and energy storage systems.
- State of the art research facilities.
- Collaborative projects with PSUs and top-class industries.
- Students are having guidance from world-renowned faculties.



Q Shaping the Future of Energy >



About Us

MTech in Energy Science and Technology (EST) is being offered from the academic year 2020 at IITH. The Department of Chemistry is initially coordinating this course. Currently, M.Tech. in EST comes under the Centre for Interdisciplinary Program. Faculty members from different departments (CHY, EE, MSE, PH) across the Institute with expertise in Energy, Materials, and Technology serve as instructors for the diverse curriculum

How to apply and selection criteria?

Eligible Candidates may register and apply through COAP portal Department may conduct a written exam and/or an interview Reservations as per the MHRD, GOI norms will be applicable MHRD scholarship will be available for GATE qualified selected candidates.

Program Duration: 2 yrs.

Student Intake: Under GATE is 5 & Sponsored is 15

Admission: GATE Score, written test and/or interview

ELIGIBILITY CRITERIA

- **B Tech/ BE in BT/ Chemical/ Civil/ EE/ ME/MSME/ MSc with CY/PH with a valid GATE Score.**
- **GATE Subjects:** AE/BT/CH/CE/CY/ EC /EE/ IN/ ME/MN/MT/PE/PH/PI/XE-C/XE-E/XE-F/XE-H/XLP/ES
- **Ministry of Education Supported students:** These students will either be admitted based on GATE score or if they have a BTech from an IIT, they should have 8.0 or more CGPA.
- **Govt Lab/Industry Sponsored students:** These candidates should have first class BTech with a minimum experience of 2 years in any Public industry or any Government research lab. GATE qualification is exempted for them. They will be selected based on a written test and/or an interview. They will not receive any scholarship.
- **Self-Sponsored students:** These students should have first class BTech and will be selected based on a written test and/or an interview. They will pay a tuition fee of Rs. 20,000 per credit for 48 credit in 24 months. The admission fee of Rs. 1 lakh will be absorbed in the tuition fee. They will not receive any scholarship.



Message from the Centre for Interdisciplinary Program Chair



Professor Renu John

Department of Biomedical Engineering

IIT Hyderabad

Email: chair.cip@iith.ac.in

Phone: +91-40 2301-6101

The Master of Technology (M.Tech.) program in Energy Science and Technology (EST) is an interdisciplinary program being launched from the academic year 2020 at IIT Hyderabad. The Department of Chemistry is initially coordinating this program. Currently, 11 faculty members from various Departments (i.e., Chemistry, Chemical Engineering, Electrical Engineering, Physics and Materials Science, and Metallurgical Engineering) across the Institute with numerous expertise in Energy, Materials, and Technology are serving as instructors to this diverse curriculum. The goal of the program is to impart and foster knowledge in energy research and development and also encompasses state-of-the-art approaches to shape the future of energy. Broad areas include, but are not limited to Fossil Fuels, Power Engineering, General Energy, Renewable Energy, Energy Storage, Nuclear Energy, and so forth.

The M.Tech. course curriculum does not only help the students to develop the theoretical knowledge of energy but also provides practical knowledge on various aspects like renewable energy systems, energy storage systems, electric vehicles, and energy-battery management systems.

The two year course has been incorporated with one-year project work, which will make the students develop advanced practical knowledge of their choice and most importantly, enable the students with a very good amount of research flavor. I believe the program will continue to grow and will open up a new realm of possibility for funding, facilities, new energy systems development, and would contribute significantly to the growth of the Institute.



Message from the Faculty-in-Charge, EST

Over the last couple of decades' energy has become the central focus of the modern economy. Access to power is critical to every country's wealth, lifestyle, and image. The Indian transport ministry has also announced going 30% electric mobility by 2030. It is worth noting here that the heart of EVs is the energy storage systems (i.e., batteries) and power electronics. Also govt. Targets to install 225 GW plant of renewable energy by 2022. Thus, a fundamental breakthrough in clean energy research is needed to solve the problem of such magnitude. Energy Science and Technology (EST) was founded in 2020 as an inter-disciplinary group at IIT Hyderabad offering an M. Tech program. This program aims to impart and foster knowledge in energy research & development and state-of-the-art approaches to shape the future of energy.

Our learning environment and courses are very colorful and energetic, which stimulates the passion for learning and curiosity. Through the high quality of teaching and research environment, students would develop a high aspiration, and a lifetime of memories.

We provide each student with relevant research opportunities which will help to shape their future.

As a Coordinator my aim is to ensure that each student can achieve and progress to their full potential, in their academic, and creative development.

With this information, I warmly welcome all to this vibrant M. Tech program in Energy Science and Technology (EST) in order to succeed and develop skills towards clean energy research.



Dr. Surendra Kumar Martha

Department of Chemistry

IIT Hyderabad

Email: fic.mtech.est@iith.ac.in

Phone: +91-40 2301-6259



CORE COURSES

LIST OF COURSES

Total of 14 credits of courses needs to be done in first semester

Total of 14 credits of courses needs to be done in second semester

- Fundamentals of Electrochemistry
- Non-conventional Energy Sources and Environment
- Energy management
- Material Synthesis and Characterization
- Electrochemical energy storage systems
- Power Systems Engineering and controllers for Renewable applications.
- Energy Audit
- Bioenergy
- Photovoltaic(PV) Technology
- Lab: Energy Conversion and Storage Devices*
- English Communication
- Industry lecture Series

*Compulsory course





ELECTIVE COURSES

LIST OF COURSES

Third and Fourth Semester includes MTech Thesis of 12 credits in each semester

Students can choose either Industry related or Lab related work for their MTech Thesis

- Hydrogen Economy
- Electric Vehicles
- Bio-Refinery
- Energy System analysis
- Fuel cell technology
- Petroleum refinery
- Combustion engineering
- Data analysis tools for experimental research
- Statistical design and analysis
- Optimization techniques
- Advanced transport phenomenon
- Molecular Thermodynamics
- Nuclear energy
- Lab: Laboratory Methods in Electrochemistry and Related Analysis
- Data Science and Analysis

Our Faculty Members

Dr. Surendra K. Martha

PhD-2006, IISc Bangalore

Research Interests:

Materials Electrochemistry with special emphasis on Li-ion, Na-ion, Lead acid Batteries, Ultracapacitors and Recycling Batteries.

Prof. Ch. Subrahmanyam

PhD-2003, IIT Madras

Research Interests:

Heterogeneous Catalysis, Nanomaterial Synthesis with Energy and Environmental Applications.

Prof. M. Deepa

PhD-2004, CSIR-NPL, New-Delhi

Research Interests

Materials Electrochemistry, Quantum Dot Solar Cells, Beyond Li-ion Batteries & Electrochromic Devices.

Department of Chemistry



Dr. Sai Santosh Kumar Raavi

Ph.D. 2009: University of Hyderabad

Research Interests:

Optics and Spectroscopy of Energy Conversion Material

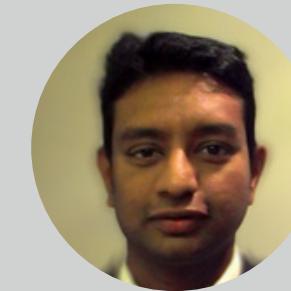


Dr. Siva Kumar K

PhD-2010, IISc Bangalore

Research Interests:

Multilevel Inverters, Open-end Winding Induction, Motor Drives, Switched Mode Power Conversion, Microgrids, Power Quality and Control.



Dr. Pradeep Kumar Yemula

PhD: IIT Bombay

Research Interests:

Smart Grids, Power System Control Centers, Information Technology Architectures, Ontologies for Power System Events, Common Information Model (CIM), Interoperability and Standards.

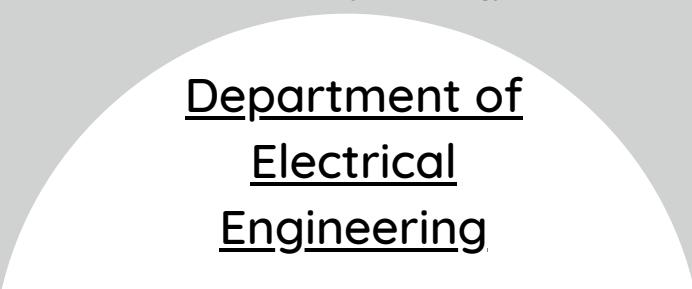


Dr. Rupesh Ganpatrao Wandhare

PhD-2014, IIT Bombay

Research Interests

Power Electronics, Renewable Energy Sources, Distributed Energy Generation Standalone and Hybrid Energy Generation.



Department of Electrical Engineering



Department of Chemical Engineering



Dr. Debaprasad
Shee

PhD-2008, IIT Kanpur

Research Interests:

Catalysis over supported metals and metal oxides, Nanostructured catalysts, Structure property correlations, Fuels and chemicals from renewable sources and reaction engineering.



Dr. Praveen
Meduri

PhD-2015, The University of Louisville

Research Interests:

Multiscale materials, Energy Storage and Conversion, Renewables.

Department of Material Science and Metallurgical Engineering



Prof. Suhash
Ranjan Dey

Ph.D-2006 University PaulVerlaine Metz, France

Research Interests:

Advanced Multi-Functional Nanostructured Materials/High Entropy Alloys, Combinatorial Alloy Design of Emerging Materials.



Dr. Atul
Deshpande

PhD-2004, Max Planck Institute of Colloids and Interfaces

Research Interests:

Nanostructured Materials for Energy Conversion and Storage, Catalytic and Biomedical Applications.





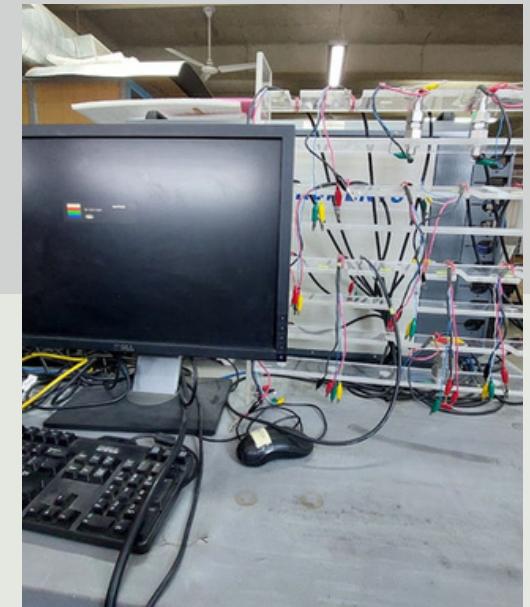
Ball Milling Setup



Synthesis Apparatus

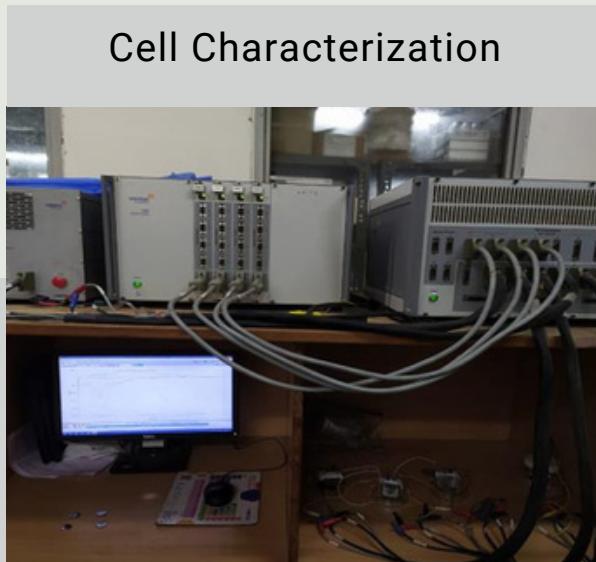


Glove Box Assembly

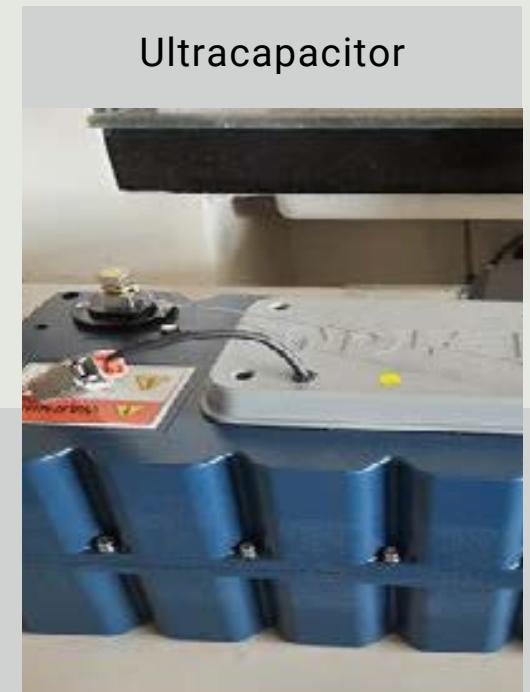


Battery tester setup

EST Facilities



Cell Characterization



Ultracapacitor



Chemi-sorption Apparatus



Electrical machines Lab



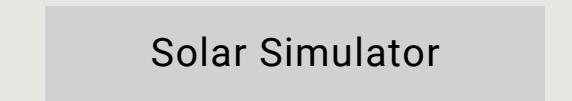
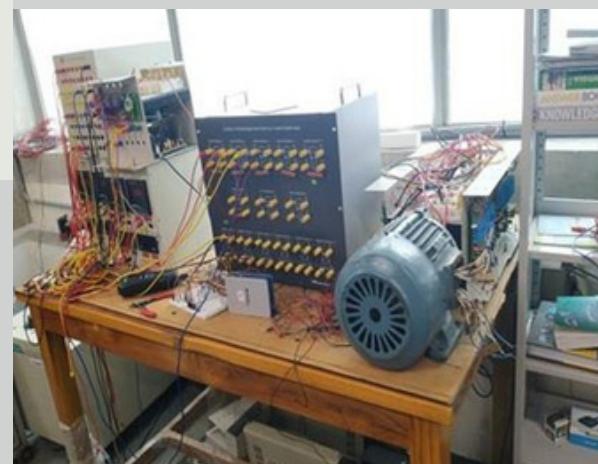
Power aPhysi-sorption
(BET) adsorption
apparatus

EST Facilities



Solar Cell Testing

Power Electronics Lab



Solar Simulator



INDUSTRY LECTURE SERIES (2021-22)



Green Avni Solutions LLP

Clean environment and reliable clean energy for all!

Company Name: Green Avni Solutions LLP,
Hyderabad

Speaker: Mr. Prakash Rapolu, Managing Partner and
Founder

Title of talk: Environment and Energy: Insights from
Green Avni Team

LOG

Company Name: Log 9 Materials, HQ and R&D
Centre, Bengaluru, India

Speaker: Mr. Hemant Charya, VP, R&D

Title of talk: Alternative energy storage solutions for
Electric Vehicles and stationary applications



Company Name: ARCI, IITM Research
Park, Chennai

Speaker: Dr. R. Gopalan, Regional
Director

Title of talk: Propelling Materials
Technology for Electric Vehicle,
Automotive, and Sustainable Energy
Sectors

Company Name: Tata Steel Ltd
Speaker: Dr. Supriya Sarkar, Head

Environmental Research
R&D,

Title of talk: Recovery of Energy:
Iron and Steel Industry



TATA STEEL

INDUSTRY COLLABORATIONS



Company Name: Roshan Energy
Technologies Pvt. Ltd. Hyderabad
Speaker: Mr. S. A. Gaffoor, Director
and CEO
Title of talk: Battery Energy Storage
Systems and Challenges.



Company Name: Godi India Pvt Ltd,
Hyderabad
Speaker: Mr. Mahesh Godi, Founder &
CEO
Title of talk: On-Grid Online Mode.



Company Name: High Energy Batteries
(India) Ltd, TN
Speaker: Mr. V Ravichandran, Head of R
& D
Title of talk: Batteries for strategic
Defense Needs



Company Name: Rechargion Energy
Pvt Ltd, Pune India
Speaker: Dr. Vilas Shelke, CEO
Title of talk: Energy, Entertainment,
and Entrepreneurship



Company Name: IBM Industry Academy,
IBM Consulting, Frankfurt, Germany.
Speaker: Mr. Biren Gandhi, Global
Industry CoE Leader - Energy,
Environment & Utilities, Executive Partner
& Member,
Title of talk: Digitalization of the Energy
Transition

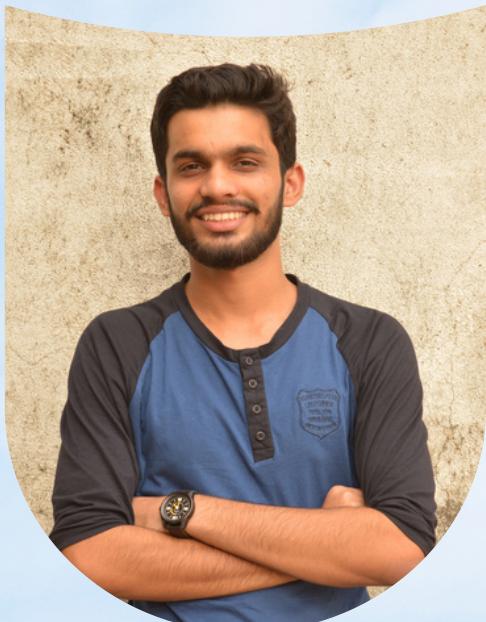


Company Name: ABB Global
Industries & Services Pvt. Ltd
Speaker: Dr. Mayukha Pal
Title of talk: Sustainability: The
focus area of Energy Industries

And many More >>>



EST STUDENTS



Background: Mechanical Engineering

Areas of Interest: Hydrogen Storage, production and transport, Electrochemistry, Data Science and Analysis, HVAC

Software Skills: SolidWorks, MATLAB, PVsyst, MS Office

Programming Skills: Python, R, LATEX

Projects: Principal Component Analysis on a dataset, Printed solar cells, Performance Improvement of Solar PV Systems, Heat Load Calculations for a Sports Complex for Better Indoor Air Quality, Parsing NASA thermodynamic data

Past Experience: Internship at Central Railway Loco Workshop, Parel, Mumbai, Trainee at Canbara Industries Pvt. Ltd

SAURAV S SANKHE



Background: Electrical Engineering

Areas of Interest: Renewable Energy, Batteries, Electric Vehicles, Machine Learning

Programming Skills: Python, MATLAB and Arduino programming

Projects: Stock Market Analysis using Linear Regression, Hardware implementation of Supercapacitor based Electric Vehicle Power System with PID controlled Boost converter, Fabricated working model of charging system of an electric vehicle battery, Fabricated working model of Uninterrupted Power Supply (UPS), Fabricated Power Bank with Type c Fast Charging Capabilities

Research Experience: IEEE research article on 'Design and Development of Fast Charging for Lead Acid Battery', DOI: [10.1109/GCAT47503.2019.8978435](https://doi.org/10.1109/GCAT47503.2019.8978435)



AAYUSH MANISH NAGAR





EST STUDENTS



RAHUL GHUGE



Past Experience: Sr. Engineer at LG Electronics India Pvt Ltd.
Internship at Endurance Pvt. Ltd., Aurangabad.

Background: Mechanical Engineering

Areas of Interest: Machine Learning, Data Science, Simulation & Modelling, Energy Storage Devices, Hydrogen & Fuel Cells, Alternative Fuels, Solar PV and Thermal etc.

Software Skills: AutoCAD, SolidWorks, PVsyst, MATLAB, , MS Office

Programming Skills: Python, C++

Projects: Study of Plasmonic Solar Cells, Time-Series Forecasting of Solar Irradiance, Advanced Adiabatic Compressed Air Energy Storage, Fabrication of Automatic Multi-Purpose Agriculture Machine., Study of Auto-Pilot Mode Technology in Automobiles.

Past Experience: Industrial Training at "Engine Development Directorate", RDSO Lucknow

Research Experience: Feasibility Analysis of Methanol as a fuel in Diesel Locomotives Engines



SHANTANU GUPTA





EST STUDENTS



TAMAL HOWLADAR



Background: Electrical and Electronics Engineering

Areas of Interest: Electric Vehicles, PV system, Power electronic converters, energy storage devices, data science, machine learning.

Software Skills: PVsyst, SketchUp, MATLAB

Programming Skills: C++, Java, Python

Projects: Design and installation of standalone EV charging station completely powered by solar photovoltaic system, Building Integrated Photovoltaic analysis and its feasibility, Design and complete analysis of roof top solar plant using SketchUp software, Time series forecasting of solar radiation, Energy audit of a hostel building, Speed control of D.C motor using chopper.

Past Experience: Project Engineer (Wipro Limited)

Trainee, Electric Loco Shed, Bhilai, Chhattisgarh,

Trainee, NTPC-SAIL Power company Pvt Ltd (NSPCL) Bhilai, Chhattisgarh

Background: Electrical and Electronics Engineering

Areas of Interest: Smart grid, Data Science, Electric vehicles, Power Electronics and Power System

Software Skills: PVsyst, Sketchup ,MS Office

Programming Skills: Python, MATLAB, Java,

Projects: Copra extractor, Home security using embedded system, 3D modeling of solar power plant, Printed circuit board fabrication and project development

Past Experience: Kerala State Electricity Board 66kV Substation, Alappuzha
Bharat Sanchar Nigam Limited, Ernakulam
Diesel Power Plant, Kozhikode

Research Experience: Sustainable energy and Indian villages - KirillITH, Indian Institute of Technology Hyderabad
Copra Extractor - International Multi-conference on Computing, Communication and NanoTechnology



HEERA



EST STUDENTS



Background: Electrical Engineering

Areas of Interest: Electric Vehicle, Renewable Energy, MS Office, Power Electronics
Converters, Power System, Electrical Machines and Data Science

Software Skills: MATLAB-Simulink, PVsyst, SketchUp

Programming Skills: JAVA, Python

Projects: Data analysis of electrical energy consumption, Simulation of On-Grid solar power plant at New Delhi, India using PVsyst software, Solar PV plant 3D modeling with SketchUp and Skelion, Modeling of electric vehicle using Matlab-Simulink , Design of fully standalone solar photovoltaic fed EV charging station, Drawing and writing robot.

Past Experience: DoxPro Robotics Pvt Ltd Internship
220 KV Substation, Amravati

Research Experience: Paper presentation on "Simulation and performance analysis of photovoltaic system using PVSYST software" - ChemPlus and SRC,
Article on "Sustainable energy and Indian villages" - KIIT-IITH Indian Institute of Technology Hyderabad ,
Article on "Alternatives to the conventional solar power plant" - KIIT-IITH Indian Institute of Technology Hyderabad



SAMKEET SANGAI





PLACEMENT STATISTICS (BATCH OF 2020-22)

-  Suzuki Motors Japan
-  Bakers Hughes
-  Rashtriya Chemical Fertilizers Limited
-  ZF India Pvt Ltd
-  L & W Constructions Pvt Ltd





Lets Connect ...

Office of Career Services, IIT Hyderabad

Visit us @ <https://ocs.iith.ac.in/> to know more about the registration process for recruitment.

OCS Email: office.placement@iith.ac.in



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Saurav S Sankhe
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Dr. Pradeep Kumar Yemula

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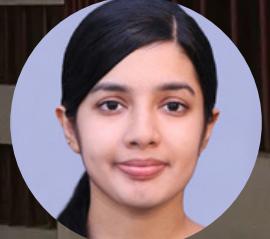
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Tel: +91 7978733508



Samkeet Sangai

Placement Coordinator (EST)
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Tel: +91 7414935406



Heera

Internship Coordinator
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Tel: +91 6282203356

An Interdisciplinary Approach...

We are a group with diverse backgrounds in engineering and technology. With an interdisciplinary approach towards the program, faculty members from different disciplines impart knowledge and latest research in different aspects related to energy and sustainability. The students, then deep dive into different areas in energy research and development to shape the future of energy!



ENERGY SCIENCE AND TECHNOLOGY

Shaping the future of energy



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🌐 <https://iith.ac.in/>

Designed by:
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MTech Student, EST