CENTRE FOR ENERGY STUDIES
IIT DELHI

Contributing to the field of energy education and research since 1976

PLACEMENT BROCHURE 2021-2022
HISTORY
Realizing the need for education and research in the field of energy, the Government of India established a national Centre for Energy Studies (CES) at the Indian Institute of Technology Delhi in the year 1976.

MISSION
Building a new generation of Energy Engineers to provide sustainable energy solutions for meeting the energy demand of the society.

VISION
Forming manpower to develop, install, operate and maintain solutions in a way to provide sufficient energy to the increasing global population in a sustainable manner.

UNIQUE SELLING POINT
Our energy engineers come from interdisciplinary backgrounds and possess different combinations of technical knowledge and skills to face the potential challenges of the energy sector.
It is my great pleasure to introduce our Centre for Energy Studies (CES), Indian Institute of Technology Delhi which is a pioneer in Energy Education in our country and continues its excellent service in contribution to academics and research for more than 45 years. The CES provides the requisite manpower for contributing to all aspects of the cutting-edge technology development for achieving the targeted goals of clean and renewable energy, and energy & environment. CES students are eager to take up exciting careers in the energy sector.

Our CES students could surely make valuable contributions as leaders, innovators, technocrats, and resource experts/engineers to the downstream and upstream of energy sectors and resolve issues of the energy-related environment. It is a proud moment to recall that our CES alumnus in various capacities makes their excellent contribution to the development of sustainable energy and the environment. As conventional energy is in the transition phase to clean and renewable energy, I am sure that our CES students could play a major role in strengthening the sustainable energy industries/institutions.
OFFERED PROGRAMS

M.Tech. (2 years)

- Energy Studies
- Energy and Environment Technologies and Management
- Renewable Energy Technologies and Management (For mid career professionals)
COURSE CURRICULUM

ENERGY STUDIES (JES)
Focus on energy efficiency, electrical and thermal aspects of power plant engineering, environmental compliance, sustainable and renewable energy technologies and economics

- Economics and planning of energy systems
- Energy Conservation
- Direct energy conversion
- Non-conventional sources of energy
- Integrated energy systems
- Solar energy utilization
- Solar PV devices and systems
- Fuel technology
- Hydrogen energy
- Wind energy and Hydro power systems
- Fusion energy
- Energy, ecology and environment
- Power plant engineering
- Power generation, transmission & distribution
- Electrical power system analysis
- Operation and control of electrical energy systems
- Heat Transfer
- Zero emission vehicles
- Solar thermal power generation
- Internal Combustion Engines
- Hybrid Vehicles
ENERGY AND ENVIRONMENT TECHNOLOGIES MANAGEMENT (ESN)
Focus on interrelationships between environment and energy sector, energy management, energy efficiency.

- Economics and financing of renewable energy systems
- Non-conventional sources of energy
- Quantitative methods for energy management and planning
- Cogeneration and energy efficiency
- Distributed and decentralized energy systems
- Developing energy efficiency and renewable energy projects
- Energy audit
- Industrial energy and environmental analysis
- Fuel technology
- Environmental audit and impact assessment
- Energy and environment

- Power system planning and operation
- Operation and control of electrical energy systems
- Battery storage
- Electrical energy management
LAB FACILITIES

IC ENGINE & ALTERNATE FUEL

- AVL Research engine
- Smoke meter
- Spray Chamber setup
- VISEOFEM, FTIR & NDIR Analyzer
- Combustion & Exhaust Analyzers
- Simulation/CFD software
- Methanol fuelled test rig with oxygen-combustion
- SI, CI & HCCI Engine setup for DME, CNG, Hydrogen, Biodiesel fuel

SOLAR PHOTOVOLTAIC

- Thin film deposition
- Excitonic solar cell fabrication
- 25 kWp roof top PV generator
- Solar Simulator
- Thermal evaporator
- UV Visible Spectrophotometer
- Impedance analyzer
- Time resolved Photo luminescence setup
- PV powered PEFC fuel cell

ELECTRICAL POWER & RENEWABLE ENERGY SYSTEMS

- Transmission line models
- Smart DC home, smart meters
- Unbalanced Distribution models
- Power flow and stability analysis
- DSPACE based Power electronic converters
- Renewable energy Integration
- Wind/Solar emulator
- Vertical axis Wind Turbine Power generation
- AI based simulation framework

ENERGY EFFICIENCY, CONSERVATION & SIMULATION

- Portable energy audit instruments
- Clamp type voltmeter, ammeter & power factor meter
- Software package for Energy Efficient Building Design
- Optimum power system expansion model
- Electrostatic Monitoring Precipitator
- AI integrated simulation framework for performance analysis of energy systems
PLASMA PHYSICS

• Software on beam propagation methods & self organization/chaos
• Compact ECR plasma sources
• Large volume plasma system
• High resolution optical emission spectrometer
• Automated rf compensated Langmuir Probe system
• Atmospheric pressure cold plasma jet
• Microwave generator (2.45 GHz) up to 15 kW power.

SOLAR THERMAL & REFRIGERATION

• Light pipe system
• Thermal imaging infrared camera
• Differential scanning calorimeter
• Pyranometer and Pyrheliometer with sun tracker
• Ultrasonic Homogenizer
• Thermocouple calibrator
• Thermoelectric generator/Refrigerator setup
• Solar PV based Thermoelectric cooling system

FUEL TECHNOLOGY

• Control of pollution from fuel firing
• Oil from wastes
• Coal desulphurization & coal cleaning
• Conversion of cola to liquid
• Carbon emission control
• Gas Chromatography - Gas Analyzer
• Muffle furnace – Proximate analysis of fuels
• Bomb Calorimeter
• Pyrolyzer
• BOD incubator with Rotary shaker

ADVANCED BATTERIES RESEARCH LAB. (ABRL)

• Battery tester (for coin cell and pouch cell)
• Electrochemical work station
• Battery fabrication assembly
• Glove box facility
• Electrolyte conductivity analyzer
• Electrolyte moisture analyzer (coming soon)

WIND & HYDRO POWER ENERGY LAB. (UPCOMING)

• Wind Tunnel
• Hydraulic Turbine test rig
ONGOING M.TECH PROJECTS

- Machine Learning based real-time EV Scheduling algorithm for Demand Response Applications with Grid Constraints
- Microcontroller Based Phase Locked Loop for Renewable Energy Injection to the Grid
- Optimal volt VAR control in LV distribution system
- Optimization Framework for Integrated Energy Systems
- LF control of low scale building Micro-grid
- Battery thermal management system of Li-ion batteries working at Micro-grid level
- Optimization of thermal management of Li-ion battery
- Early prediction of Li-ion battery cycle-life
- Identifying the Attributes of life cycle impact assessment of high performance batteries
- Modern AI techniques for wind turbine forecasting
- Forecasting of Solar Thermal Energy Potential using Artificial Intelligence Techniques
Medium-Term Forecasting of Solar Radiation using Hybrid Modeling

Smart cooling technology for fast charging EVs

Growth of amorphous silicon layers for solar cell applications as the carrier-selective layers

A micro inverter to control two PV modules simultaneously

Cooling of Solar Photovoltaic using Phase Change Material (PCM)

Design of receiver for Super Critical CO2 as Heat Transfer Fluid in Solar Thermal Power Plant

Transparent Conducting Oxide Silicon Solar Cell

Investigation on role of field gradient on electron transport through a magnetic filter through simulation

Equilibrium model development and Exergy analysis of solid waste gasification

Growth of thin films by the Chemical and physical vapor deposition techniques

Study on methanol direct injection in a spark ignition engine under hybrid mode

Design and development of regulated dc power supply for atmospheric pressure plasma application
## SPONSORED RESEARCH PROJECTS

<table>
<thead>
<tr>
<th>PROJECT TITLE</th>
<th>PRINCIPAL INVESTIGATOR</th>
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<tbody>
<tr>
<td>Thermochemical Conversions of Ligno cellulosic Biomass/Wastes into Bioenergy &amp; Biofuels with its Utilization in IC Engine</td>
<td>Prof. K.A. Subramanian</td>
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<tr>
<td>Model Development &amp; Analysis of Flash Boiling Sprays for IC Engines</td>
<td>Prof. Kaushik Saha</td>
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<tr>
<td>Development of a methanol-gasoline fuelled spark ignition engine</td>
<td>Prof. K.A. Subramanian</td>
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<tr>
<td>Strengthening Energy &amp; Environmental Research &amp; Teaching Infrastructure through the FIST Programme</td>
<td>Prof. K.A. Subramanian</td>
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<tr>
<td>Sustainable Technologies for Distributed Level Application and Energy Support to Rural Development-II (STAR-II)</td>
<td>Prof. Dibakar Rakshit</td>
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<tr>
<td>Design &amp; Demonstration of Sustainable Building Infrastructure (under Centre of Excellence for Sustainable Infrastructure)</td>
<td>Prof. Ashu Verma</td>
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<tr>
<td>Strategic University Network to Revolutionize Indian Solar Energy (SUNRISE)</td>
<td>Prof. Viresh Dutta</td>
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<tr>
<td>Power To The People: Democratizing Energy Through Decentralized Manufacture &amp; Production of Affordable, Reliable, Sustainable Solar Power</td>
<td>Prof. Sandeep Kumar Pathak</td>
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<tr>
<td>Raising Organic Solar Cell Efficiency through Systematic Manipulation &amp;</td>
<td>Prof. Supravat Karak</td>
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<td>Control of Film Morphology &amp; Internal Built-in Potential with Electrotropic</td>
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<td>Additives &amp; Electric Field Poling</td>
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<tr>
<td>Development of Reliable &amp; Efficient Utility Scale Photovoltaic Inverter for</td>
<td>Prof. Sumit Kumar Chattopadhyay</td>
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<td>Indian Environment</td>
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<tr>
<td>Different Energy Vector Integration for Storage of Energy (DEVISE)</td>
<td>Prof. Dibakar Rakshit</td>
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<tr>
<td>Development of tools &amp; techniques for Future Unbalanced Distribution System</td>
<td>Prof. Ashu Verma</td>
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<tr>
<td>Operation: with Integration of RES, EVs, BESS &amp; Demand Side Management</td>
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<td>(DUDS)</td>
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<td>Atmospheric Water Generator</td>
<td>Prof. S.K. Tyagi</td>
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<td>Laser Driven Particle Acceleration (Women Scientist project of Dr. Monika</td>
<td>Prof. R. Uma</td>
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<td>Singh)</td>
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<td>Development &amp; characterization of an ECR plasma thruster</td>
<td>Prof. Debaprasad Sahu</td>
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<tr>
<td>Demonstration of Effective Technology Solutions to eliminate &amp; use waste from</td>
<td>Prof. Satyananda Kar</td>
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<td>municipal drains in Delhi</td>
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Highly active in research activities and national & international collaborations, our department has ongoing projects worth 181.4 million INR.
Our faculty is always on the go for making it big!

Appointed as Guest Associate Editor of the Journal ‘Frontiers in Nanotechnology’ and also be serving as the Topic Editor for ‘Nano-materials for Energy Applications’

Appointed as Associate Editor for the International Journal of Green Energy. His major areas of research include IC Engine processes, two-phase flows in automotive & power generation sectors.
Virtual industry visits, webinars and so much more....

Solar PV System & Applications
Lecture by Dr. J.S. Chandok, AGM, REE Division, NTPC

Energy Swaraj bus demonstration by Prof. Chetan Singh Solanki

Virtual Industrial Visit by ASHRAE India
PAST RECRUITERS
NOTABLE ALUMNI

Pradeep Bansal
Director
Satya International Ltd

V.N. Choudhary
Former Executive Director
NTPC Ltd.

Dr. Ashok Kumar
Director
Bureau of Energy Efficiency

Sunil Gokhale
Director
Sustainable Energy & Water

Pankaj Kumar Gupta
CEO
Zero Square Energy Solutions Pvt. Ltd.

Suprotim Ganguly
CEO
GITA

Inderjeet Singh
Director
Deloitte

Himanshu Upadhyay
Assistant Director
Central Electricity Authority

Vaibhav Chowdhary
Director
Energy Policy Institute at University of Chicago (EPIC)

Uma Rajarathnam
Global Head
Enzen Global Solutions

Inderjeet Singh
Director
Deloitte

Himanshu Upadhyay
Assistant Director
Central Electricity Authority

Vaibhav Chowdhary
Director
Energy Policy Institute at University of Chicago (EPIC)

Uma Rajarathnam
Global Head
Enzen Global Solutions
HOW TO RECRUIT US?

- **IIT Delhi sends you invitation**
  Once you show interest, a mail is sent by the placement office along with relevant information and registration link. Interested in recruiting us? Send us a mail at energyiitdelhi@gmail.com or you can also mail directly to Office Career Service at placement@admin.iitd.ac.in

- **Company fills JNF (Job Notification Form)**
  JNF requires company to fill in mandatory details of the Job profile-role offered, pay package, place of posting, eligible departments. The JNF has to be frozen on OCS website by company till a deadline, after which student shall be able to view all details, and eligible students may apply.

- **Shortlist, Interview & Recruitment**
  After the application deadline for the students is over, the resumes are visible to the company. The company submits the list of students before deadline. Shortlisted students get notified about the dates for campus interviews. After completion of selection procedure on campus, company is required to announce the final list of the student same day itself.
FACULTY COORDINATOR

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STUDENT COORDINATORS

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