Prof. Viresh Dutta, Head, CES

"The present-day energy scenario reflects very well the prescience of the Centre founding fathers who recognized the importance of the subject in early 70s and the pioneering work done the CES in the following years has contributed a great deal to the developments in the area of Energy in the country. The need for training the students in analysing and understanding the complexities involved and then contribute to the development of different energy devices and systems was also recognized and the M-Tech. programmes run by CES has done this very successfully."

Prof. Dibakar Rakshit, Professor-In-Charge, T&P, CES

"Interdisciplinary areas pertaining to Renewable Energy is drawing significant attention from various stake holders. Industries which work in this arena are getting a huge support from government as well. Our (CES) courses are definitely ready to cater this industrial surge which is making the recruitment drive to reach such a level where most of our students are placed in reputed organization during last academic year (2017-18)."
About Us

The Centre for Energy Studies at the Indian Institute of Technology was established in the year 1976. It is an inter-disciplinary centre offering M-Tech in Energy Studies (Full time) and Ph.D. The Centre derives its strength from the engineering disciplines of Electrical, Mechanical, Instrumentation, and Chemical along with the fundamental sciences, Physics and Chemistry.

- Distribution system analysis and optimization
- Power system stability
- Evaluation of multi generation frequency control
- System expansion planning
- Smart grid, micro grid and rural electrification

- Solar thermal:
  - Solar cooker
  - Concentrated solar power systems
  - Solar thermal energy storage
  - Storage material characterisation
- Solar photo-voltaic:
  - Silicon solar cells
  - Perovskite based solar cells
  - Organic PV solar cells

- CFD analysis of IC engine processes
- Backfire study on Hydrogen fuelled SI engine
- DME direct and port injection
- Methanol fuelled SI engine
- Endurance test on lubricating oil
- Frictional study on IC engine

- Coal liquefaction and gasification
- Refining of Petroleum and Natural gas
- Biofuels: Solvent extraction process, double transesterification process
- Biochar and waste water treatment plant
- Biooil extraction through pyrolysis process
- Oil / gas extraction from waste biomass

- Negative Hydrogen ion production
- DC, RF and ECR sources
- Atmospheric pressure plasmas
- ECR thrusters
- Plasma theory and simulation
Major Courses

- Non-Conventional Energy Sources
- Wind Energy and Small Hydro Power
- Solar Energy Utilization
- Direct Energy Conversion
- Operation and Control of Electrical Energy System with Renewable Integration
- Cogeneration & Energy Efficiency
- Energy Conservation
- Power Generation, Transmission and Distribution
- Alternate Fuels for Transportation
- Economics, Planning & Financing of Energy Systems

Tools and Technologies

- TRNSYS 18
- PV Syst
- EnergyPlus
- HOMER Energy
- ANSYS FLUENT
- CONVERGE CFD software
- COMSOL MULTIPHYSICS
- ETAP System Integration
- TracePro
- LabVIEW
- NREL System Advisor Model (SAM)
Some of the on-going projects by M. Tech students:

- Estimation of solar radiation for Indian climatic conditions
- Thermal Characterisation of Phase Change Material
- Development of DME fuelled Compression Ignition engine
- Demand Side Management for unbalanced distribution system
- IOT based Zero Energy Building
- Development of STATCOM for two-area AGC system
- Study of frictional power of hydrogen fuelled Spark Ignition engine
- Studying Optoelectronic properties of hybrid heterojunction for Photovoltaic application
- Development of Perovskite based solar cell

Some of the Joint Projects with Industries by Past Batches:

- Study of Switching Transients & their Mitigation Techniques: (Jointly with ABB)
  - Determination of optimum switching angle for different types of load and modelling of circuit breaker characteristics for Hardware-In-Loop (HIL) testing
- Dynamic Stability Study of Interconnected Microgrid Systems: (Jointly with Deloitte)
  - Modelling and simulation of grid connected and standalone Microgrid systems
- Application of Load Profiling to Demand Response: (Jointly with Tata Power Delhi Distribution Limited (TPDDL))
  - The project focuses on segmentation of electricity consumers based on their load profile and identification of target consumer section for Demand Response program
RESEARCH GROUPS AND FACILITIES:

❖ Electrical Power and Renewable Energy Systems Group: (Lab Facilities)

1. Renewable Energy Systems & Simulation Lab:
   - Wind Emulator
   - Solar Emulator
   - MPPT based Solar PV
   - Transmission Line Models
   - Smart DC home

2. Wind and Small Hydro Lab:
   - Low Speed Vertical Axis Wind Turbine
   - Different Types of Micro Hydro Turbine Generator System (8kW)

3. Energy Analytics & Optimization:
   - Modules to Analyse Unbalanced Distribution and Transmission Network
   - Power Flow Analysis
   - Stability Evaluation
   - Security Analysis, State Estimation
   - Optimal power flow studies

❖ Solar Photovoltaic Research Group:

Lab Facilities
- Plasma Cleaner
- Solar Simulator
- Thermal Evaporator
- UV visible Spectrography
- PLQE
- Plasma Enhanced Chemical Vapour Decomposition
- Capacitance Voltage Measurement

❖ Solar Thermal Research Group:

Lab Facilities
- Light Pipe System
- Thermal Imaging Infrared Camera
- Differential Scanning Calorimeter
- Solar Pyranometer and Pyrheliometer
- Ultrasonic Homogenizer
- Thermocouple Calibrator
❖ **Internal Combustion Engines and Unconventional Fuels Group**

Lab Facilities
- AVL Research Engine and Smoke Meter
- VISEOFEM
- FTIR and NDIR Analysers
- Combustion Analysers

❖ **Plasma Science and Technology Group**

Lab Facilities
- Software on beam propagation methods and self-organization/chaos
- High resolution spectrometer for plasma emission spectroscopy
- Large volume plasma system (volume ~ 2 cu. m)
- Compact ECR plasma sources
- Microwave Generator at 2.45 GHz up to 5 kW Power

❖ **Fuel Technology Group**

Lab Facilities
- Gas Chromatograph: Gas Analyser
- Muffle Furnace: Proximate Analysis of Fuels
- Coke Reactivity Index
- BOD Incubator with Rotary Shaker
- SOx let Extractor
- Microbial activities related to Coal, Biomass and industrial effluents
PLACEMENT PROCEDURE

- Interested companies contact professor-in-charge or placement officer, Training and Placement Cell for a Job Notification Form (JNF) at placement@admin.iitd.ac.in.

- JNF requires the companies to fill in mandatory details of the job profile – role offered, pay package, place of posting, eligible departments.

- Once the filled-in-JNF with all the required details is received, companies are assigned username/password to access their online account on T&P website.

- Companies are also assigned space on the server on which they may upload any presentation, videos, data or other information they want the students to see.

- The JNF has to be frozen on the T&P website by the company till a deadline, after which the students shall be able to view all the details, and the eligible students may apply.

- After the application deadline for the students, the resumes are visible to the company. The company submits shortlist on its online account before a deadline.

- Shortlisted students get notified. The placement office allots the dates for the campus interviews.

- After the completion of the selection procedure on campus, company is required to announce the final list of the students on the same day itself.

- If a student is selected, the job is registered against him/her and he/she would not be allowed to appear for more interviews as per placement policy.
PAST RECRUITERS:
Placement Statistics 2017-18

Placement Team 2018-19

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