



MALAVIYA NATIONAL INSTITUTE OF TECHNOLOGY JAIPUR

# CENTRE FOR ENERGY AND ENVIRONMENT

INFORMATION BROCHURE





MALAVIYA NATIONAL INSTITUTE OF TECHNOLOGY JAIPUR  
CENTRE FOR ENERGY AND ENVIRONMENT

26th Jan, 2012      Formally inaugurated  
(6 faculty members; 2 each from ME, EE, CE)

July, 2012 Started M. Tech. program (Renewable Energy)  
45 M. Tech. students (1st and 2nd year Present strength),  
7 batches graduated

27 Registered PhD students,  
13 awarded and well placed

8 Faculty Members (6 Regular and 2 Joint Faculty)





## 1 WHAT MAKES US DIFFERENT?

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### **Access to renewable energy society**

Through wide-ranging team-work and partnerships with private, public sectors as well as national and international collaborators, actively contributing to the renewable energy sector.

### **National and international collaborative projects and activities**

Several projects (ongoing and completed) sponsored by national and international organizations and have made a major contribution in the development of sustainable, innovative technologies. High quality research services.

### **Well-equipped laboratories**

Laboratories are well equipped with state-of-the art and modern equipment, instruments for *hands-on* experience and to connect our technical knowledge with actual functioning in the fields.

### **Highly experienced faculty members**

Benefit from having world class faculty members with a high level of technical and professional knowledge in various subject areas.

## 2 ORGANIZATIONAL OBJECTIVES

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- To promote Interdisciplinary research and Innovation in key areas of energy and environment.
- To provide quality education through regular educational programs and short term programs for providing trained manpower to industry.
- To showcase successful clean and green technologies.





### 3 PROGRAM OUTCOMES

After successful completion of the M. Tech program in Renewable Energy, the student is expected to possess

- An ability to independently carry out research /investigation and development work to solve practical problems
- An ability to communicate, write and present a substantial technical report/document effectively
- An ability to demonstrate a degree of mastery over renewable energy and allied systems, at a level higher than the requirements in the appropriate Bachelor's program
- An ability to design, commission and operate renewable energy and allied systems
- An ability to improve renewable energy systems, and assess their impact on overall sustainable development

### 4 FACILITIES LOCATIONS

	<b>CEE-I (Old Administrative Block)</b>  <u>Second Floor:</u> HoD Office, CEE Office, Faculty Cabins, Renewable Energy Lab – I, Energy Storage Lab, Energy Simulation Lab, Low Energy Cooling Lab, Research Scholar Room, Discussion Room <u>Ground Floor:</u> Faculty cabins, LT-9 classroom, Store room-I
	<b>CEE-II (Opp. Estate section)</b>  Faculty cabins, CEE Office-II&III, Renewable Energy Lab-II, HVAC(DOAS) Lab, Biofuel Lab,, Meeting Room, Seminar Room, Research Scholar Room, Store room-II, Pantry







## 5 THE PEOPLE

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**Professor** (Joint appointment at Dept. of Mechanical Eng. and CEE)

**Dr. Jyotirmay Mathur**

Professor, Ph.D. (Mechanical Engineering)

**Research Interests :** Energy efficiency in buildings, Passive cooling systems, Renewable energy and energy policy modelling, Development of codes and standards, Low energy.



**Associate Professor** (Joint appointment at Dept. of Electrical Eng. and CEE)

**Dr. Rohit Bhakar**

Associate Professor, Ph.D. (Electrical Engineering)

**Research Interests :** Power Systems Restructuring, Power Systems Economics, Network Pricing, Electricity Markets, Game Theory, Risk Management, Ancillary Services



**Assistant Professors**

**Dr. Vivekanand (Coordinator)**

Assistant Professor, Ph.D. (Biotechnology)

**Research Interests :** Biomass to Bioenergy, Biofuels, Biological Waste Treatment, Wastewater Treatment



**Dr. Amartya Chowdhury**

Assistant Professor, Ph.D.(Physics)

**Research Interests :** Commercial solar photovoltaic panel, Low Concentrated Photovoltaic Systems, Building Integrated Photovoltaics, Thermal Management of PV Modules.





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**Dr. Kapil Pareek**

Assistant Professor, Ph.D. (Materials Sciences and Engineering)

**Research Interests :** Hydrogen Energy, Electrochemical Energy Conversion and Storage Systems, Battery modelling, Supercapacitor.



**Dr. Parul Mathuria**

Assistant Professor, Ph.D. (Electrical Engineering)

**Research Interests :** Deregulated Power System Operation Electricity Markets, Economics and Management, Electricity Markets, Energy Systems, Energy Management in Smart grid, Energy Conservation and renewable, Energy Planning.



**Dr. Sunanda Sinha**

Assistant Professor, Ph.D. (Electrical Engineering)

**Research Interests :** Energy Systems, Non-Conventional Sources of Energy, Solar Energy, Hybrid systems.



**Dr. Aneesh Prabhakar**

Assistant Professor, Ph.D. (Mechanical Engineering)

**Research Interests :** Thermal management, Hydrogen energy, Solar thermal systems, Heat transfer - Experiments and Simulations, Solar passive designs, Thermal energy storage.

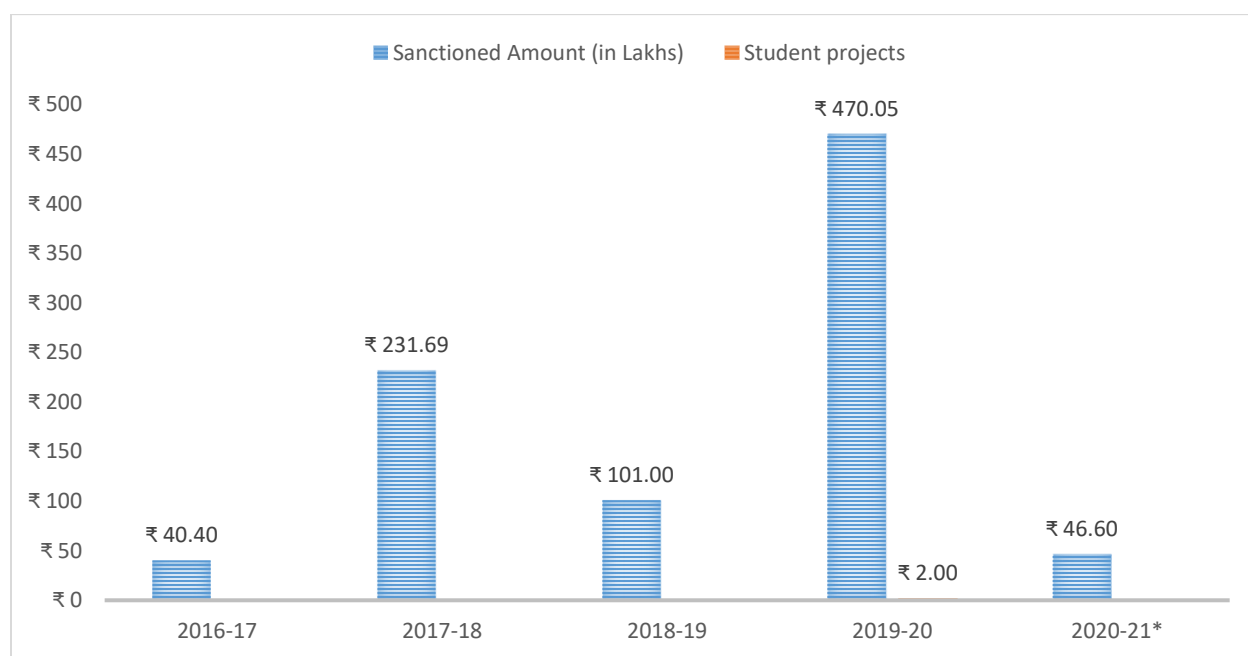




## 6 ACADEMIC AND RESEARCH ACHIEVEMENTS

- 15 Ongoing/Sanctioned National and International Research projects: ~INR 5.5 Crore
- 12 Completed projects: INR ~8 Crore
- More than 200 research publications
- Patents filed
- Cumulative *h*-index: 116

## 7 RESEARCH FUNDING SOURCES:

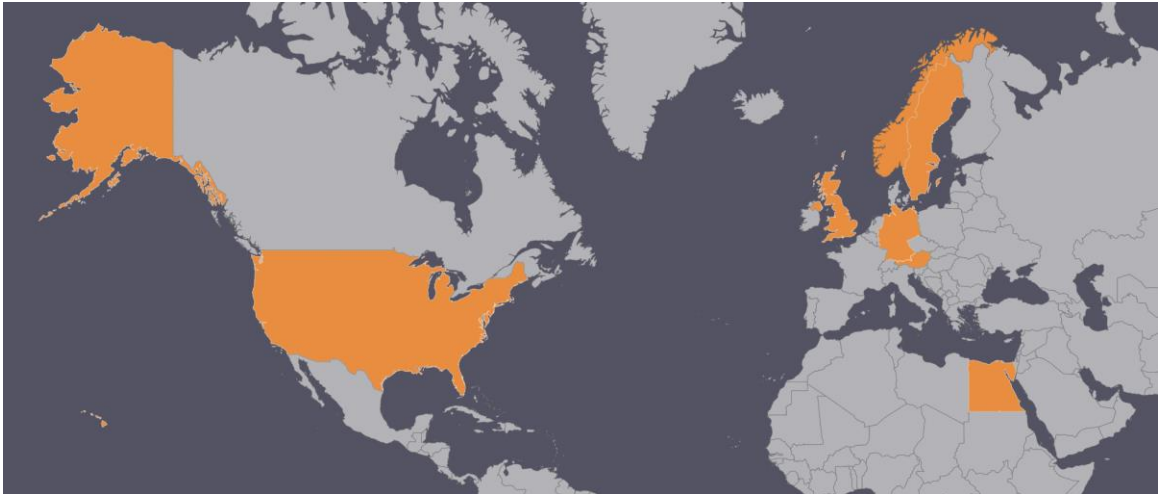


- The Indo-U.S. Science and Technology Forum (IUSSTF);
- Department of Biotechnology (DBT), Govt of India;
- Department of Science and Technology (DST), Govt of India;
- MNRE, Govt of India;
- Rajasthan Renewable Energy Corporation Limited (RRECL), Govt of Rajasthan.
- ISHRAE (for PG students)





## 8 INTERNATIONAL COLLABORATIONS



1. Lawrence Berkeley National Lab., USA
2. Oakridge National Lab., USA
3. Carnegie Melon Univ., USA
4. Karlsruhe Institute of Technology, Germany
5. Ruhr University, Bochum; Germany
6. University of Bonn, Germany
7. University of Applied Sciences, (OTH) Amberg-Weiden, Germany
8. Oxford Brookes University, UK
9. University of Natural Sciences and Life Sciences (BOKU), Austria
10. Swedish University of Agricultural Sciences, Sweden
11. Agriculture Research Centre, Egypt
12. University of Houston, USA
13. Institute of Materials Research and Engineering, Singapore .... Etc







## 9 M. TECH PROGRAM SCHEME

	Credit requirement
Taught courses- Core	18
Taught courses- Program Electives	18
Taught courses- Open Electives	
Seminar	3
Dissertation <sup>§</sup>	21
Special topics (MOOCs)*	0-3
<b>Total</b>	<b>60</b>

§ Dissertation grade to be counted for CGPA.

\*MOOCs can be opted in the 2nd, 3rd or 4th semester in option to Institute open elective courses

### 9.1 SEMESTER-WISE BREAKUP

Semester 1	Taught Courses (Core) 12 Credits	Taught Courses (Elective) 6 Credits
Semester 2	Taught Courses (Core) 6 Credits	Taught Courses (Elective) 12 credits
Semester 3	Seminar 3 Credits	Dissertation 9 Credits
Semester 4	Dissertation 12 Credits	





## 10 CURRICULUM

Sl. no.	Subject Code	Course Title	Core /Elective	Credit	L	T	P	T	P
<b>Semester 1</b>									
1.	ENT 5xx	Bioenergy Systems	Core	3	3	0	0	3	-
2.	ENT 5xx	Photovoltaic Systems	Core	3	3	0	0	3	-
3.	ENT 5xx	Solar Thermal Systems	Core	3	3	0	0	3	-
4.	ENT 8xx	...	Elective	3	3	0	0	3	-
5.	ENT 8xx	...	Elective	3	3	0	0	3	-
6.	ENP 5xx	Renewable Energy Laboratory	Core	3	0	0	6	-	-
<b>Semester 2</b>									
1.	ENT 6xx	Energy Management and Audit	Core	3	3	0	0	3	-
2.	ENT 6xx	Energy Economics and Policies	Core	3	3	0	0	3	-
3.	ENT 8xx	...	Elective	3	3	0	0	3	-
4.	ENT 8xx	...	Elective	3	3	0	0	3	-
5.	ENT 8xx	...	Elective	3	3	0	0	3	-
6.	ENT 8xx	Energy Simulation	Elective	3	3	0	0	3	-





Sl. no.	Subject Code	Course Title	Core /Elective	Credit	L	T	P	T	P
<b>Semester 3</b>									
1.	ENQ 5xx	Seminar	Mandatory	3	0	0	6	-	-
2.	END 5xx	Dissertation <sup>§</sup>	Mandatory	9	0	0	18	-	-
<b>Semester 4</b>									
1.	END 5xx	Dissertation <sup>§</sup>	Mandatory	12	0	0	24	-	-

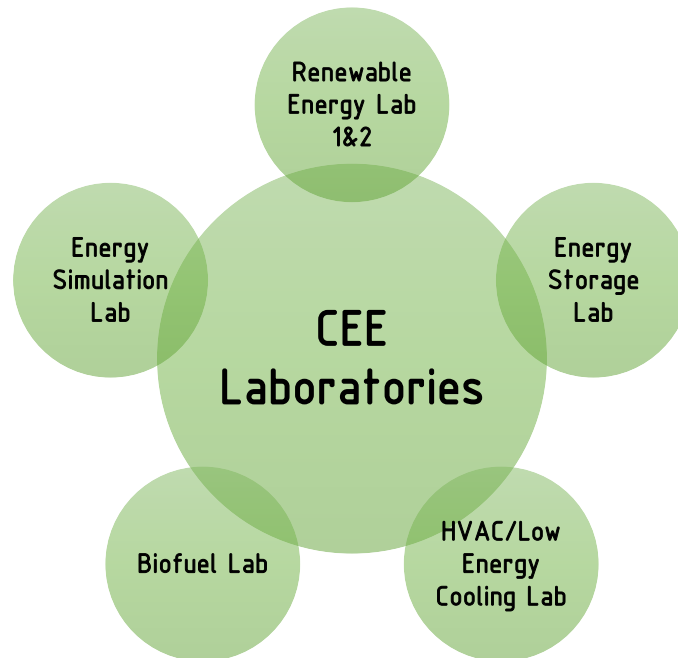
### 10.1 LIST OF ELECTIVES


ENT 8xx	Energy Storage Technology	Elective	3-0-0
ENT 8xx	Energy Efficiency in Buildings	Elective	3-0-0
ENT 8xx	Wind Energy Systems (Sem1 2021)	Elective	3-0-0
ENT 8xx	Hydro Energy Systems	Elective	3-0-0
ENT 8xx	Advanced Photovoltaic Systems	Elective	3-0-0
ENT 8xx	Renewable Integration Markets	Elective	3-0-0
ENT 8xx	Modeling And Optimization of Energy Systems	Elective	3-0-0
ENT 8xx	Smart Grid Systems (Sem1 2021)	Elective	3-0-0
ENT 8xx	Solar Passive Heating and Cooling	Elective	3-0-0
ENT 8xx	Hydrogen Energy Technology	Elective	3-0-0





## 11 CEE LABORATORY FACILITY



1	<b>Renewable Energy Lab</b>
	





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2 Energy Storage Lab



3 Energy Simulation Lab







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4 **Biofuel Lab**



5 **Low Energy Cooling Lab**



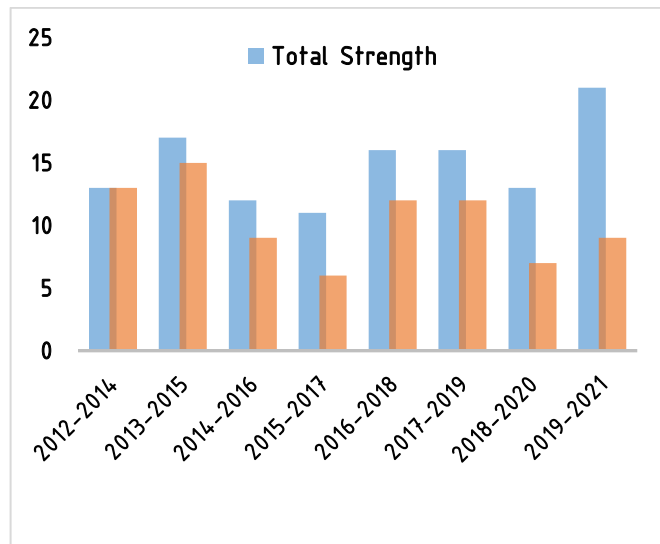


6 Discussion Room



## 12 INDUSTRY ENGAGEMENT AND PLACEMENT

- Green Rating for Integrated Habitat Assessment (GRIHA) Council
- Energy Efficiency Services Ltd (EESL)
- PricewaterhouseCoopers Pvt Ltd (PWC)
- Lloyds Register
- Jones Lang laSalle
- BuroHappold
- Amplus Solar
- Innovative Solar
- Oorja Energy
- RAYS Power infra






## 13 WEBSITE

Centre for Energy & Environment

- › Home
- › People
- › Upcoming Events
- › About Us
- › Research
- › CEE Activities
- › Major Placements
- › Student Project
- › Newsletter
- › Photo Gallery
- › ALUMNI of CEE
- › Faculty Login
- › Department Login

Weather @MNIT



POSOCO Power System Awards (PPSA)-2020 MNIT Jaipur conferred the IREDA NIWE 2019 Award for Best Instit

Celebrating 9 Years of Excellence (2012-2021) and Looking Beyond

**Centre**

Centre for Energy and Environment aims to find sustainable solutions to global energy inadequacy and environmental degradation as the global energy systems will experience major changes in coming decades. These challenges call-for scientific knowledge, innovative-technology development, policy measures and action at local and world level. The sustainability of the system will prove to be of prime importance-environmentally, economically and socially.

Although the fossil resources have been fundamental source of energy for human existence since long time in everyday life and now the time of oil discoveries are almost over. Addressing the challenges arising from issues of energy scarcity will involve a massive increase in the utilization of sustainable energy resources like wind, solar and biomass. This transformation will not take place overnight but decades. For this reason, high priority to use renewable energy systems and energy efficient buildings should be given.





## 14 STUDENT CENTRIC ACTIVITIES @CEE :

- Energy Headlines Newsletter (being published since inception of CEE)
- Sustainable Energy and Environment Quiz (SEEQ), Annual event, 7 editions
- GREENOVATION, Annual project competition, 3 editions
- NIWE Award for Wind Energy 2019
- Solar Decathlon India, India Power Award 2016, 2017
- Winner of Wipro Earthian Competition 2016
- India Solar Hackathon 2016
- Visit to RE-Expo every year
- Winners of Renewable Energy Conservation Awards (RECA) by Government of Rajasthan – 6 consecutive years
- POSOCO awards for Masters and PhD scholars

The screenshot displays the website interface for the Centre for Energy & Environment. The header includes the title "Centre for Energy & Environment" and a navigation menu with options: Home, People, Upcoming Events, About Us, Research, CEE Activities, Major Placements, Student Project, and Newsletter. The main content area features a tabbed interface with "EvapCal" selected. The page title is "EvapCal" and it shows "Visits: 3". The text describes EvapCal as a design analysis tool for evaluating performance of direct, indirect, and two-stage (indirect-direct) evaporative coolers. It is designed to help decision makers in taking informed decisions related to system sizing, water requirement, required air changes and resulting supply air condition with respect to thermal comfort of occupants. The tool utilises hourly weather files for analysis and offers three main utility tabs, namely:





**Energy Club**  
**MNIT ISHRAE Student Chapter**

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**The Energy Headlines**  
THE ENERGY NEWSLETTER OF MNIT JAIPUR

*"You cannot get through a single day without having an impact on the world around you. What you do makes a difference, and you have to decide what kind of difference you want to make"*  
- Jane Goodall

### TRANSPARENT SOLAR PANELS

**Eco-Warrior**



Radhakrishnan Nair, a Gujarati businessman has planted around 40 forests, totalling an amount of 6 lakh trees, all by himself in various states of the country.

In the modern age of mass energy consumption, there is a continuous rising demand for the same. To cater these, energy is being produced from renewable sources, one of which is the **solar energy**. But the cost of setting up the panels is too high. Also, a large amount of area is required to set up the solar panels for large amount of energy production.



then the captured light is transported to the contour of the panel where they are converted to electricity with the help of photo-voltaic solar cells. These panels have been made long lasting, so they can be fitted into the window panes very cheaply as most of the cost of conventional photovoltaics does not come from the solar cell itself but the materials mounted on it. The energy generated from the solar panels is not enough to power the whole building

