



AVIT
AARUPADAI VEEDU INSTITUTE OF TECHNOLOGY



**VINAYAKA MISSION'S
RESEARCH FOUNDATION**
(Deemed to be University under section 3 of the UGC Act 1956)



DEPARTMENT OF MECHANICAL ENGINEERING

Association with
ENERGY AND FUEL USERS' ASSOCIATION (ENFUSE) Organizes

Employability Enhancement Skill Development Course on “SOLAR ENERGY, ALTERNATIVE FUELS AND WIND ENERGY” (From 27.4.2023 TO 03.5.2023-30 Hours)

The Department of Mechanical Engineering in association with Energy and Fuel users' Association & Institution's Innovation Council (IIC)organised a five day's **Employability Enhancement Skill Development Course** on " **SOLAR ENERGY, ALTERNATIVE FUELS AND WIND ENERGY** " **From 27.4.2023 TO 03.05.2023** –(30 Hours). The program was inaugurated by **Dr.M.Prabhakar, HOD / Mech.** Totally 10 sessions were conducted for five days with various resource persons. Around 68 Mechanical Engineering students have participated.

The students had an interaction with the experts and the following topics were discussed.

SESSION 1: NON CONVENTIONAL ENERGY SOURCES 27.4.23 (9 AM to 12 PM)

The First session on **NON CONVENTIONAL ENERGY SOURCES** was conducted by **Dr.M.RAJESH** Prof/Mech Hindustan Institute of technology and science
He has shared his awesome speech on

- Non-Conventional Energy sources - sources that are continuously replenished by natural processes like solar energy, wind energy, bio-energy - bio-fuels grown sustainably), hydropower etc.,
- Tidal Energy - Power produced by the surge of ocean waters during the rise and fall of tides.
- Geothermal Energy- Heat is continuously produced inside the earth which can be used for electricity production.
- Hydel Energy - The use of falling or fast-running water to produce electricity or to power machine.
- Open and closed systems of OTEC – The process that can produce electricity by using the temperature difference between deep cold ocean water and warm tropical surface waters.



SESSION 2: VCR ENGINE 27.4.23(1 PM to 3.30 PM)

The Second session on Variable compression ratio engine testing was conducted by **Mr.B.SAMUVEL MICHEAL, AP/MECH/AVIT**

He has shared his fine presentation on

- The VCR engine operating on liquid fuels and dual-fuel mode,
- Different compression ratios

- Combinations with different blends
- Various Nozzles usage in VCR engine
- Multi-fuel capability, Increasing of fuel economy and reduction of emissions
- Gas Analysers



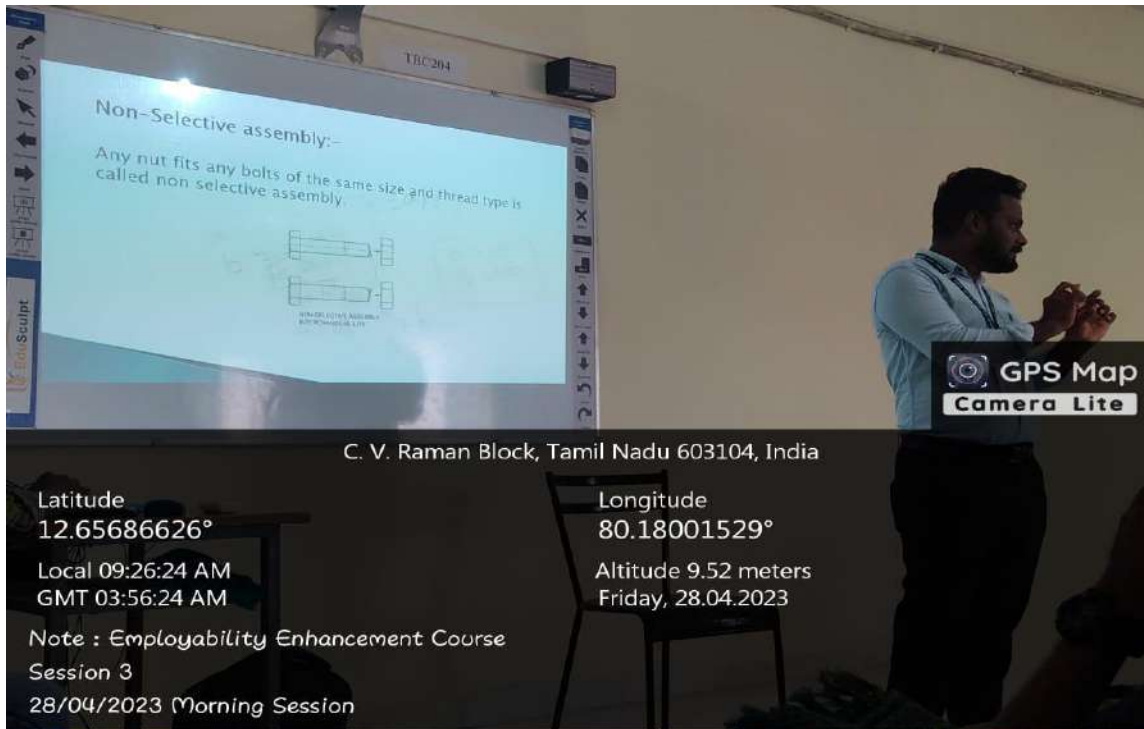
SESSION 3: ENERGY AUDITING 28.4.23(9 AM to 12 PM)

The Eighth session on Energy Auditing was conducted by **Mr.K.VINOTH** Technical Officer, CVRDE AVADI, Chennai.

He has shared his outstanding speech on

- Energy audit - An inspection survey and an analysis of energy flows for energy conservation in a building.
- Purpose of Energy Auditing- To determine whether your home wastes energy, and to pinpoint where energy is being lost so you can evaluate what measures you can take to make your home more energy efficient.
- Methods and Instruments of Energy Auditing- Like Flue Gas Analysers, Temperature Indicators , Infrared Thermometers , Thermal Insulation scanner , Steam Trap Monitor Energy consumables
- Utilization of Energy in Industries - Energy is used in the industrial sector for a wide range of purposes, such as process and assembly, steam and cogeneration, process heating and cooling, and lighting, heating, and air conditioning for buildings

Employment opportunities in Energy Auditing – Job such as assisting in identifying energy efficiency projects, their estimated cost, estimated energy savings, and estimated return on investment for clients.



C. V. Raman Block, Tamil Nadu 603104, India

Latitude
12.65686626°

Longitude
80.18001529°

Local 09:26:24 AM
GMT 03:56:24 AM

Altitude 9.52 meters
Friday, 28.04.2023

Note : Employability Enhancement Course
Session 3
28/04/2023 Morning Session

SESSION 4: BIO FUELS 28.4.23 (1 PM to 3.30PM)

The fourth session on Bio fuels was conducted by **Dr.J.M.BABU**, Prof/Mech Veltech Rangarajan Dr, Sagunthala R&D Institute of science and technology. He has shared his magnificent proficiency on

- Biodiesel production and Ethanol production
- Transesterification and Esterification methods of biodiesel production
- Biogas production from vegetables and animal fats
- Biodiesel production from sugarcane Bagasse and wood waste
- Biogas production from KVIC digester



C. V. Raman Block, Tamil Nadu 603104, India

Latitude
12.65686626°

Longitude
80.18001529°

Local 01:03:14 PM
GMT 07:33:14 AM

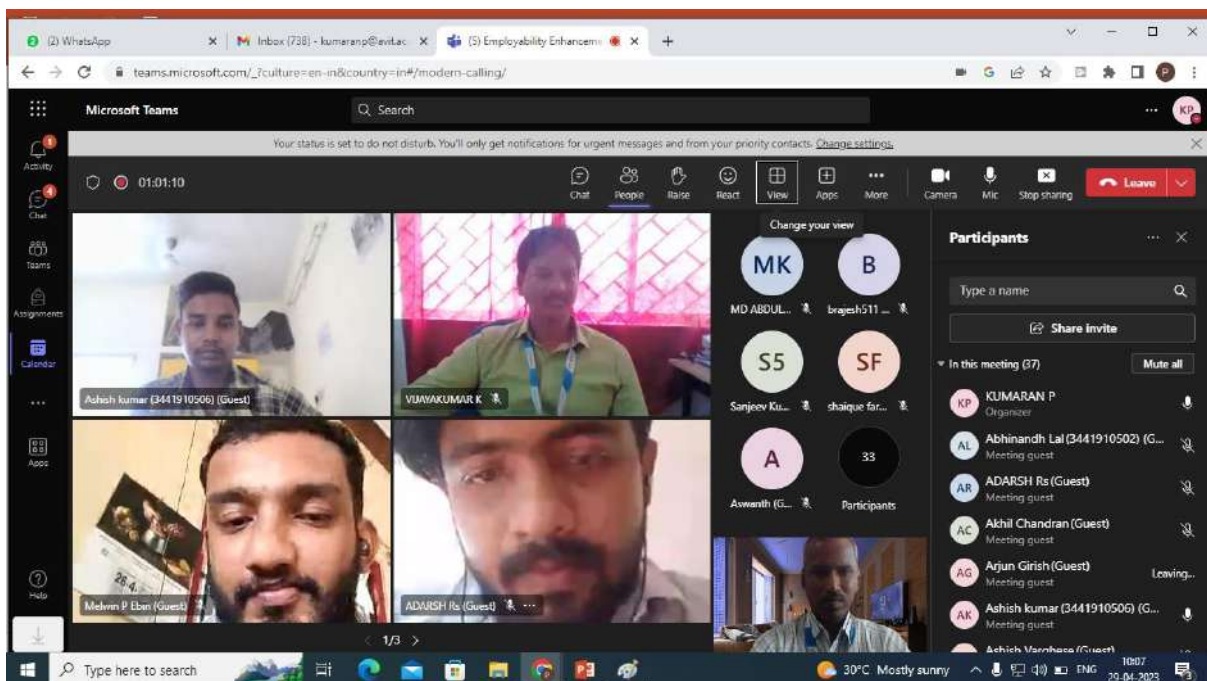
Altitude 9.52 meters
Friday, 28.04.2023

Note : Employability Enhancement Course
Session 4
28/04/2023 Afternoon Session

SESSION 5: SOLAR ENERGY 29.4.23 (9 AM to 12PM)

The Fifth session on Solar Energy was conducted by **Mr.P.KUMARAN AP/MECH/AVIT**

- Energy production from solar – How Solar radiation is converted directly into electricity by solar cells.
- Methods of energy production from Solar - The two main methods: photovoltaic cells and solar thermal collectors.
- CSP System - How plants use mirrors to concentrate the sun's energy to drive traditional steam turbines or engines that create electricity.
- Solar Collectors – How the Flat plate collectors and Concentrator collectors works
- Energy storage systems - The capture of energy produced at one time for use at a later time to reduce imbalances between energy demand and energy production.
- Solar power plant - The type of facility that converts sunlight either directly, like photovoltaics, or indirectly, like solar thermal plants, into electricity

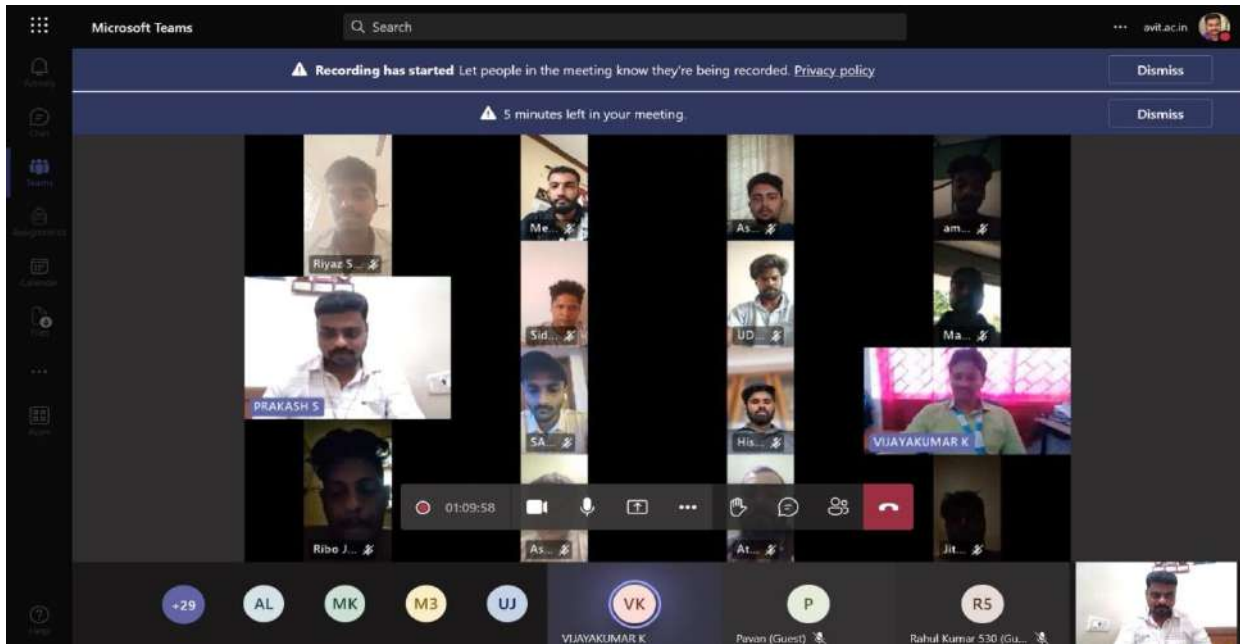


SESSION 6: INDUSTRIAL SAFETY 29.4.23 (1PM to 3.30PM)

The sixth session on Industrial safety was conducted by **Dr.S.PRAKASH AP/Mech/AVIT**.

He has shared his spectacular articulation on

- Safety management practices that apply to the industrial sector
- To protect industrial workers, machinery, facilities, structures, and the environment.
- General safety, Material safety, Fire safety, Electrical safety, Building and Electrical safety and Environmental safety
- The Importance of Industrial Safety
- Industrial safety planning-Plant layout, Fire prevention systems, Health and hygiene, Safety training, Alarms and warning systems



SESSION 7: ALTERNATIVE FUELS 2.5.23 (9 AM to 11.30AM)

The Seventh session on **ALTERNATIVE FUELS** was conducted by **Mr.G.ANTONY CASMIR JAYASEELAN AP/Mech AVIT**.

He has shared his spectacular articulation on

- Biodiesel production- the process of producing the biofuel, biodiesel, through the chemical reactions of Transesterification and Esterification.
- Ethanol preparation- The steps in the ethanol production process include milling, Liquefaction, Saccharification , Fermentation Distillation and Dehydration
- Methodology for biodiesel - Various biodiesel production methods have been introduced, such as direct use and blending, microemulsion, transesterification, and pyrolysis.
- Energy production from Waste- Waste-to-energy plants burn municipal solid waste (MSW), often called garbage or trash, to produce steam in a boiler that is used to generate electricity.
- Usage of Ethanol in I.C.Engines- Pros and cons of ethanol usage.



SESSION 8: WIND ENERGY 2.5.23 (12PM to 2.30 PM)

The third session on Wind energy was conducted by **Mr.A.ELANTHIRAIYAN** AP/MECH/AVIT. He has shared his magnificent speech on

- Production of Wind Energy - Wind turbines use blades to collect the wind's kinetic energy. The blades are connected to a drive shaft that turns an electric generator, which produces (generates) electricity.
- Design parameters - The turbine performance has been varying with the design parameters such as, pitch angle, number of blades, airfoil type, turbine radius and its chord length.
- Availability - If the turbine is “available” and grid-connected, and the wind and other conditions are within the turbine specification, then power will be generated.
- Types of axis in wind turbines - Horizontal-Axis Turbines and Vertical-Axis Turbines
- Employment opportunities in Wind Energy system - The partial list of the **types** of engineers employed in the **wind** power industry: aerospace engineers, civil engineers, computer engineers, electrical engineers, environmental engineers, health and safety engineers, industrial engineers, materials engineers, and mechanical engineers.



SESSION 9: ON BOARD DIAGNOSTICS (9 AM to 12 PM)

The Second session on Bosch lab was conducted by
Dr.M.SARAVANA KUMAR,AP/Mech, AVIT.

He has shared his outstanding presentation on

- The present engineering industries are rapidly moving to adopt Industry 4.0 approach.
- The Automation in present engineering practices
- Vehicle air-conditioning systems
- Engine diagnostics
- Auto electrical test bench
- Industrial Sensors
- Industrial Mechatronics and Robotics



SESSION 10: BIOMASS (1 PM to 2.30 PM)

The sixth session on Biomass was conducted by **Mr.R.MAHESH** AP/Mech AVIT.

He has shared his outstanding presentation on

- Biomass - Plant or animal material used as fuel to produce electricity or heat.
- Biomass collection – Biomass is collected from waste of Grasses, agricultural crops (such as corn and sugar cane), landfill waste, and manure.
- Energy production from waste- There are number of ways of generating energy from waste. These include combustion, gasification, Pyrolysis, anaerobic digestion and landfill gas recovery.
- Opportunities in waste technology- The prospects of Waste Management in our country have reached its highest level today and the field is considered to be a great career option.,
- Biogas preparation from Animal waste, Food waste .wood waste etc – The method of using anaerobic digestion of organic waste (food waste and animal manure) to produce biogas as an alternative process to reduce food waste and generate energy.



End of the session:

Online test was conducted at the end of tenth session.

Feedback regarding the sessions was collected from the students

Course completion certificates was issued to the students

ONLINE TEST



FEEDBACK FROM STUDENTS



CERTIFICATE DISTRIBUTION



Outcome:

The programme was conducted on the employability enhancement for Mechanical students. The students gained knowledge in Production of energy, Utilisation of energy, Estimation and Cost return investment on Energy Auditing, Bio-fuels, Wind Energy, Solar systems, and various renewable resources. They received information on various job opportunities in Wind power industry, Aerospace areas, Environmental, Health areas, solar power plants and Energy production Industries. They were provided adequate details on self employment in the same field.

The **Employability Enhancement Course** was conducted by **Mr.R.Mahesh,AP/Mech,AVIT.**