



In Partnership With Diversity Learning Institute-DLI & Twikatane e.V Vermany

Master's Degree Course: Renewable Energy, M.Sc. RE , M.Sc.
 Course Duration: 12 months(1 year) 2 semesters(Total Credits = 60)

(A) Modules Outline:

Module Name	Module Code	Teaching Hours	Credits
Semester 1 Modules			
Fundamentals of Renewable Energy	RE 601	30 hours	10
- Introduction to Renewable Energy Sources	-	10 hours	-
- Energy Conversion Technologies	-	10 hours	-
- Renewable Energy Policies and Regulations	-	10 hours	-
Solar Energy Systems	RE 603	30 hours	10
- Photovoltaic Technology	-	10 hours	-
- Solar Thermal Systems	-	10 hours	-
- Solar Energy Applications	-	10 hours	-
Wind Energy Technologies	RE 605	30 hours	10
- Wind Turbine Technology	-	10 hours	-
- Wind Energy Conversion Systems	-	10 hours	-
- Wind Energy Integration	-	10 hours	-
Semester 2 Modules			
Biomass and Bioenergy	RE 602	30 hours	10
- Biomass Conversion Technologies	-	10 hours	-
- Biofuel Production and Applications	-	10 hours	-
- Biomass Energy Policies and Sustainability	-	10 hours	-
Hydropower Systems	RE 604	30 hours	10
- Hydropower Technology	-	10 hours	-
- Environmental Impact Assessment	-	10 hours	-
- Hydropower Project Management	-	10 hours	-
Geothermal Energy	RE 606	30 hours	10
- Geothermal Resource Exploration	-	10 hours	-
- Geothermal Power Plants	-	10 hours	-
- Applications of Geothermal Energy	-	10 hours	-

(B) How Artificial Intelligence (AI) Can Be Applied in This Course:

1. Energy Forecasting and Optimization:

- Utilizing AI algorithms to analyze renewable energy production data for accurate forecasting and optimizing energy systems.

2. Smart Grids and Demand Management:

- Implementing AI in smart grid systems to enhance demand management, improve grid stability, and integrate renewable energy sources efficiently.

3. Remote Monitoring and Maintenance:

- Using AI for remote monitoring and predictive maintenance of renewable energy systems, reducing downtime and improving system reliability.

4. Data Analytics for Performance Enhancement:

- Applying AI-driven data analytics to optimize the performance of renewable energy systems, identify inefficiencies, and enhance overall energy output.

5. Energy Policy and Decision Support:

- Employing AI models for analyzing energy policies, regulations, and market trends to support decision-making in the renewable energy sector.

6. Machine Learning for Resource Assessment:

- Utilizing machine learning algorithms for accurate resource assessment in renewable energy projects, such as solar and wind potential mapping.

By integrating AI into the Renewable Energy course, students can gain a comprehensive understanding of how advanced technologies can contribute to the efficient and sustainable use of renewable energy sources.