FDTS Form

Birla Institute of Technology & Science, Pilani, Pilani Campus

Academic – Undergraduate Studies Division

FDTS (BITS F421T/BITS F422T/BITS F423T/BITS F424T)

The student should correctly fill in this Proforma and submit to Head of Department within two weeks of registration.

Name of the Student Rachit Gandhi

ID No. 2020B4A81440P Discipline Mathematics

Course No. BITS F421T

No. of units intending to register for (9 to 16): 16

Topic of the thesis: Predictive Models for Efficient Grid Connection of Renewable Energy Sources

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Signature of the Student

Panel of Examiners (To be suggested by the supervisor(s))

S.No.	Name of Faculty	Department/Div./Unit
1.		
2.		

30/08/2024
Date

Signature of supervisor

(P.T.O)

OUTLINE OF FIRST DEGREE THESIS
(Attach extra sheet, if necessary)

Aim and objective(s):

1. Develop Predictive Models: Create accurate and reliable predictive models to forecast the generation and integration of renewable energy sources into the grid.
2. Enhance Grid Efficiency: Improve the overall efficiency and stability of the power grid by optimizing the integration of renewable energy.

Background of work:

The integration of renewable energy sources into the power grid has become a critical focus in the pursuit of sustainable energy solutions. The variability and intermittency of renewable energy sources like solar and wind present significant challenges for grid stability and efficiency. To address these challenges, predictive models have emerged as essential tools for optimizing the connection of renewable energy to the grid.
Recent advancements in the integration of renewable energy into the power grid have been driven by the development of sophisticated predictive models using machine learning and AI, such as Support Vector Regression (SVR) and deep learning techniques. These models enhance the accuracy of energy generation forecasts, leveraging historical data and weather patterns. Smart grid technologies, including IoT devices and advanced communication networks, facilitate real-time energy management. These innovations align with the United Nations Sustainable Development Goals, promoting affordable, clean energy and climate action. Case studies have demonstrated significant cost reductions and increased renewable energy utilization, showcasing the practical benefits of these predictive models.

Plan of work:

August
1. August 15: Complete literature review on solar and wind power generation and integration techniques.
2. August 31:Collect and analyze historical data for both solar and wind power.

September
3. September 15: Develop initial predictive models for solar and wind power generation.
4. September 30: Validate and test predictive models for both solar and wind power.

October
5. October 15: Develop integration strategies for solar power into the grid.
6. October 31: Develop integration strategies for wind power into the grid.

November
7. November 15: Complete literature review on combined solar and wind power integration.
8. November 30: Develop combined predictive models for solar and wind power generation.

December
9. December 15: Validate and test combined predictive models.
10. December 31: Complete simulation and testing of combined integration strategies into the grid.

Bibliography & References:

Signature of student

Signature of supervisor