Development of Virtual lab :Round 1 (R1) Pedagogy - Template (Worksheet)

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| Name of Faculty:  **MR. ASHISH SRIVASTAVA.**  Institute**: RAJKIYA ENGINEERING COLLEGE, BANDA**  Email ID (as submitted in the registration form): **iitrashish220@gmail.com**  Discipline to which the Lab belongs**: ELECTRICAL**  Name of the Lab: **BASICS OF ELECTRICAL LAB**  Name of experiment : **TO MEASURE POWER FACTOR AND STUDY IMPROVEMENT OF POWER FACTOR.**  (only one Experiment per worksheet. for submitting more than one experiments, please fill up another worksheet):  Kindly Refer these documents before filling the worksheet   1. Coursework (MOOC ) on Pedagogy , Storyboard , Lab Manual : <http://bit.ly/Vlabs-MOOC> 2. Additional Documentation booklet for reference.<http://vlabs.iitb.ac.in/vlabs-dev/document.php> 3. Sample Git Repository. : https://github.com/nancy2502/virtual-lab |

* 1. **FOCUS AREA:**

This experiment is based on the consumption of power**,** evaluating power factor and its improvement**.**  Students will be able to understand the experiments after seeing it visually using the concepts that they have learnt previously**.** They will learn how to access and use instruments correctly**.** It will allow them to perform experiments on their own which help them to know where they were wrong and would learn from their errors and mistakes**.** Students get to know how to analyse graphs using data obtained and then finding results**.** Various theories of the experiments are used so that the student can understand the concepts behind it**.** It is quite safe as learning from errors can sometimes be harmful as it can crash or destroy the apparatus**.**

* 1. **About the Experiment:**

Power factor and its improvement plays a very vital role in our day to day life**.** In electrical engineering**,** the power factorof an electrical power system is defined as the ratio of real power absorbed by load of the apparent power flowing in the circuit and is a dimensionless number in the closed interval of -1 to 1**.** Real power is the instantaneous product of voltage and current**.**

In an electric power system, a load with a low power factor draws more current than a load with a High power factor of the same amount of useful power transferred**.** The higher currents increase the energy lost in the distribution system and require larger wire and other Equipments**.** Because of the cost of larger equipment and wasted energy**,** electrical utilities will usually charge a higher cost to costumers where there is a low power factor**.** Hence improvement of a power factor is needed**.**

Power factor correction increases the power factor of a load**,** improving efficiency for the distribution system to which it is attached**.** Linear load with a low power factor can be corrected with a passive network of capacitors and inductors**.** The devices for correction of the power factor maybe at a central substation**,** spread out over a distribution system**,** or built into power consuming system equipment**.**

* 1. **Learning Objectives:**

The main objective of this experiment is **:**

1. To learn about power factor

2. How to calculate it

3. Improvement in power factor

**2. Instructional Strategy**

The main strategy behind this lab is to make students comfortable with the simulator by keeping it simple still interactive. To allow students to perform experiment accurately so that they can learn about the main objectives. To make them feel as they are performing the experiment in the lab and learning about the experiment.

**3. Task & Assessment Questions**

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| **SrNo.** | **Learning Objective to be met**  (choose anyone from you declared above) | **Tasks to be performed by the students** | **Assessment questions aligned to the task** |
| **1** | Calculation of power factor | To create the circuit using simulator. | Power factor is the ratio between: |
| **2** | Improvement in power factor | To connect capacitor to the circuit | If the load current decreases then power factor: |

**4. Simulator Interactions**

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| **What students will do?** | **What simulator will do?** | **Purpose of the task** |
| Input the values | perform calculation | To calculate power factor |
| Connect capacitor | Make connections | To find the improvement in power factor |
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