



# Project

**Power Lab Motor Design and  
Experiment**



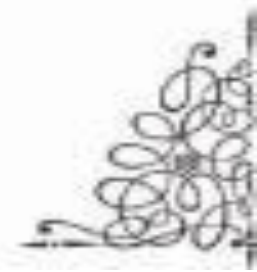
**Team Name : Pursuers**

**Team Members:**

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# Mission:

- Design a variable frequency power generation system that can provide power for various experiments within the lab
- To come up with several experiments
- For example: comparing the performance of the synchronous machine with the doubly fed induction machine



# Plan of Completion

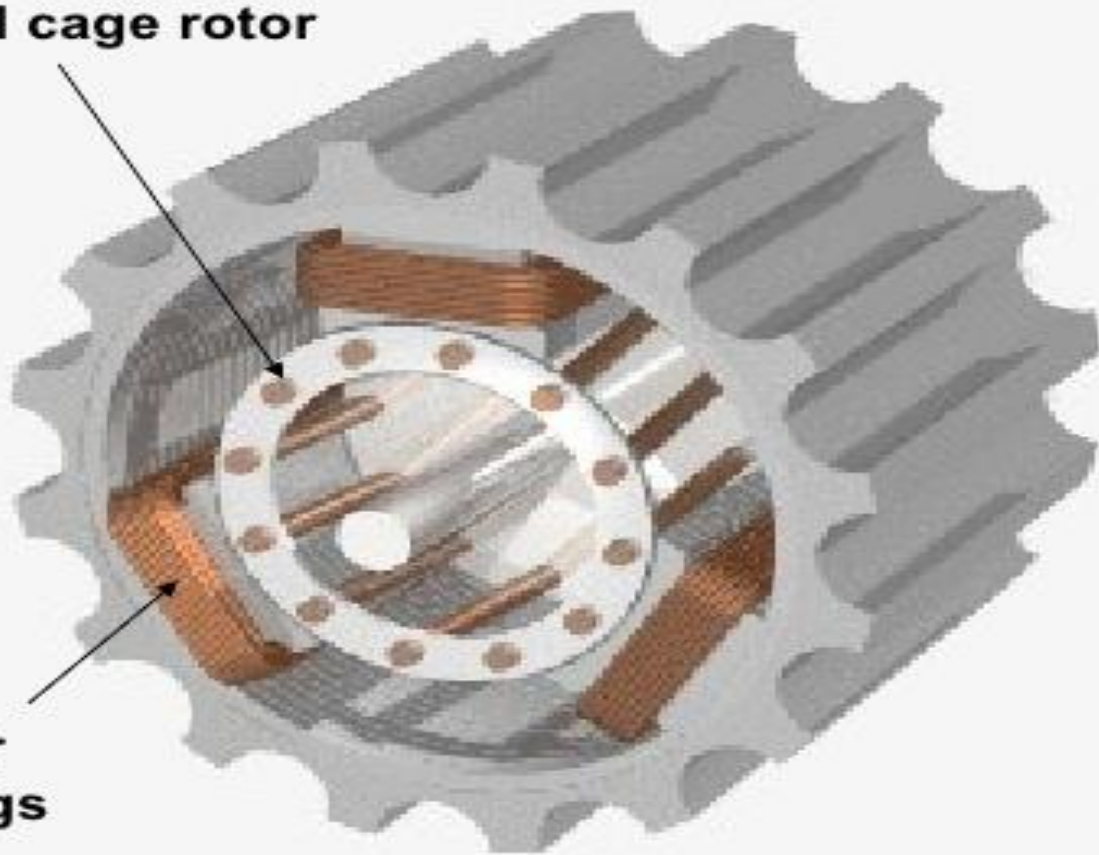
- Understand the project
- Get Familiar with the machines
- Modeling the machine
- Doing the experiments
- Meets the specification >>>>>> Writing the reports



# Three-phase induction motor

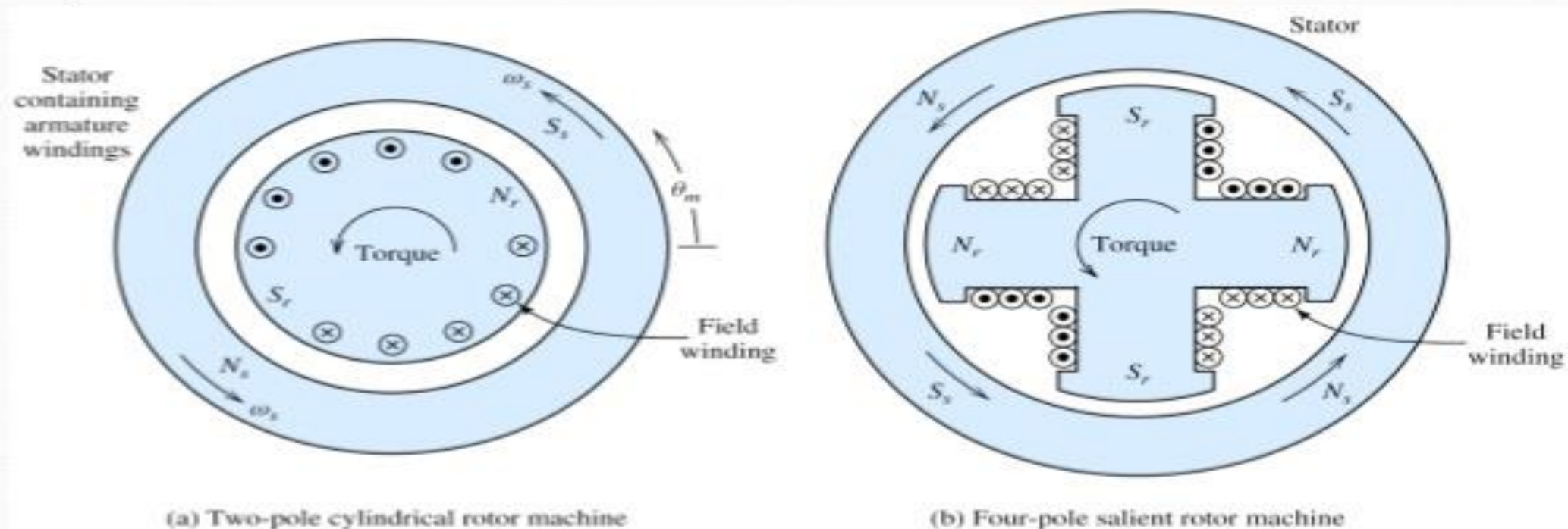
Squirrel cage rotor

Stator windings



The stator consists of wound 'poles' that carry the supply current to induce a magnetic field that penetrates the rotor. In a very simple motor, there would be a single projecting piece of the stator (a *salient pole*) for each pole, with windings around it; in fact, to optimize the distribution of the magnetic field, the windings are distributed in many slots located around the stator, but the magnetic field still has the same number of north-south alternations. The number of 'poles' can vary between motor types but the poles are always in pairs (i.e. 2, 4, 6, etc.).

# Synchronous Machine Construction



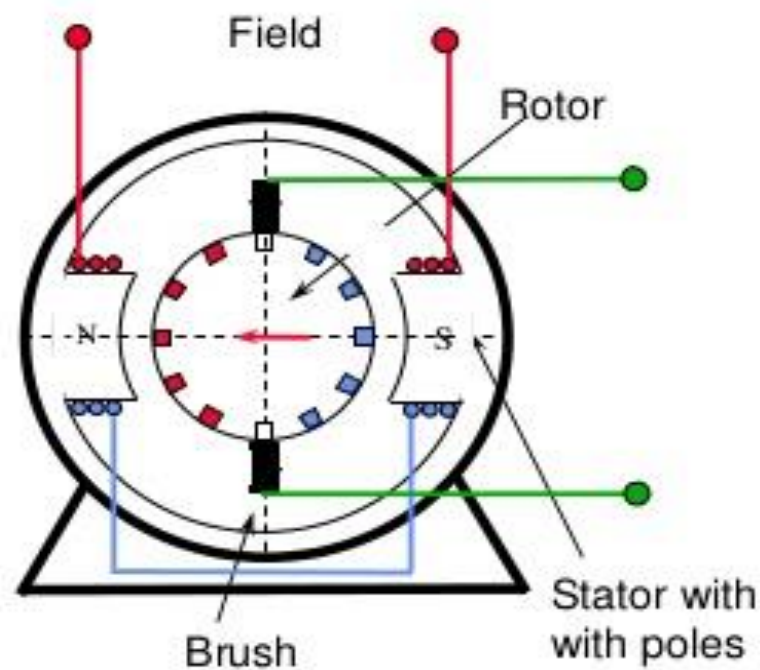
Cross sections of two synchronous machines. The relative positions of the stator and rotor poles are shown for motor action. Torque is developed in the direction of rotation because the rotor poles try to align themselves with the opposite stator poles.



# DC MACHINES

## Real DC machine Construction

- **Stator:** Stationary part of the machine. The stator carries a field winding that is used to produce the required magnetic field by DC excitation. Often known as the field.
- **Rotor:** The rotor is the rotating part of the machine. The rotor carries a distributed winding, and is the winding where the emf is induced. Also known as the armature.





# Measurement Requirements:

- Speed and Frequency

Power angle curve

- Field Voltage and Current

Voltage Boost

- Torque and Power

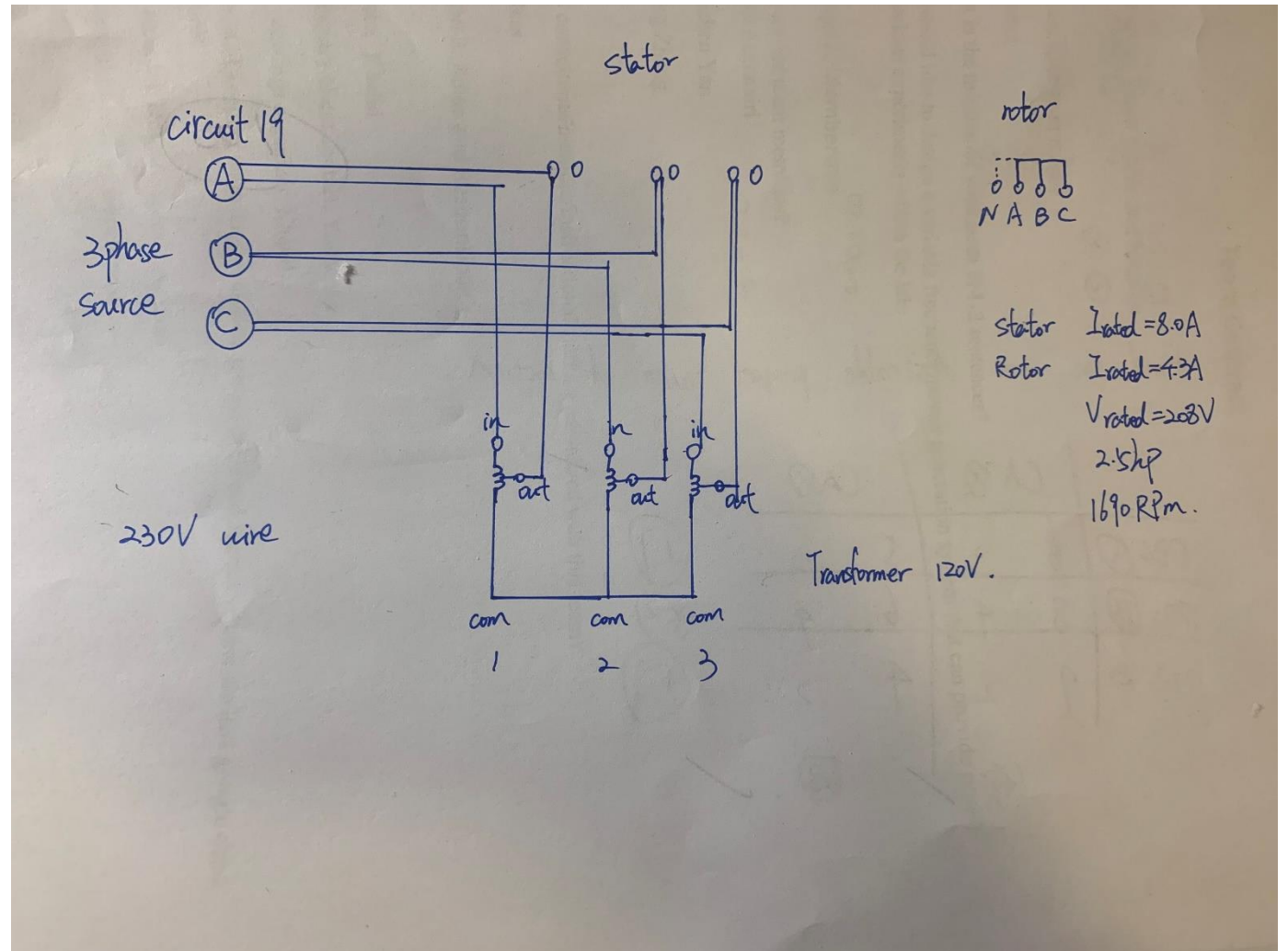
Voltage per hertz





# Achievement so far

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