

SEMESTER <i>Fifth</i>	DEPARTMENT <i>Control Engineering</i>	COURSE TITLE <i>DC Machines Lab</i>
COURSE CODE <i>EP503</i>	HOURS: 3 UNITS: 1	COURSE SPECIFICATIONS <i>Practical Content</i>
<p>1. Understands the Main Parts of a DC Machine & to Know the Shape and Function of Each of the Machine Windings.</p> <ul style="list-style-type: none"> ➤ Know the safety measures in laboratory relating to dc machines. ➤ Dismantle and familiar with the parts of the DC machine (stator – rotor – armature winding – field winding – compensating winding – commutating winding – commutator – brushes) ➤ Assemble dc motor ➤ Install and test performance. 		
<p>2. Be Familiar with the DC Generator Characteristics. Defines the Generator Excitation Methods.</p> <ul style="list-style-type: none"> ➤ Determine and draw the open circuit characteristics (magnetization curve), the load characteristics and voltage regulation of the separately excited dc generator. ➤ Determine and draw the open circuit characteristics, the load characteristics and the voltage regulation of the shunt excited dc generator. ➤ Determine and draw the load characteristics and voltage regulation of the compound dc generators (cumulative and differential) 		
<p>3. Explains the Operation Principles of a DC Motor; Its Types and Their Applications.</p> <p>Measure and verify:</p> <ul style="list-style-type: none"> ➤ The torque/current and torque/speed relationships for series, shunt, compound and separately excited motors. ➤ Carry out the load tests (efficiency curves) for series, shunt, and compound motors. 		
<p>4. Identify input & Output Devices Used in Control Systems, and Identify the Parameters of the Prime-Movers & Transducer.</p> <p>Verify:</p> <ul style="list-style-type: none"> ➤ Prime-movers: DC motor, Solenoids, Stepper motors. 		

➤ Transducers : Position, Velocity, Acceleration (force) .

References:

1. *Electrical machines for technicians and technician engineers*, Stephan F. Jorek, Longman,1972.
2. *Electrical machinery, transformers, and control*, Harold W. Gaingrich, Printice Hall ,1979.
3. *Electric machinery fundamentals*, Stephen J. Chapman, 3rd edition, McGraw-Hill, 1999.
4. *Principles of electric machinery and power electronics*, P.C. Sen , John Wiley & sons, 1989.