

Course Name : Electrical Engineering Group

Course Code: EE/EP

Semester : Fourth

Subject Title : D.C. Machines & Transformers

Subject Code: 9061

Teaching and Examination Scheme:

| Teaching Scheme | | | Examination Scheme | | | | | | |
|-----------------|----|----|--------------------|----|------|-----|----|-----|-------|
| TH | TU | PR | PAPER HRS | TH | TEST | PR | OR | TW | TOTAL |
| 03 | -- | 02 | 03 | 80 | 20 | 50# | -- | 25@ | 175 |

Rationale:

This subject is classified under core technology group which intends to teach facts, concepts, principles & procedure for operation & testing of electrical machines, such as DC motors and single & three phase transformers. Student will be able to analyze the characteristics of DC motors, Transformers & Qualitative Parameters of these machines.

These machines are used in transmission, distribution & utilization systems. Knowledge gained by the students will be helpful in the study of technological subjects such as utilization of electrical energy, switch gear & protection, manufacturing processes & testing & maintenance of electrical machines.

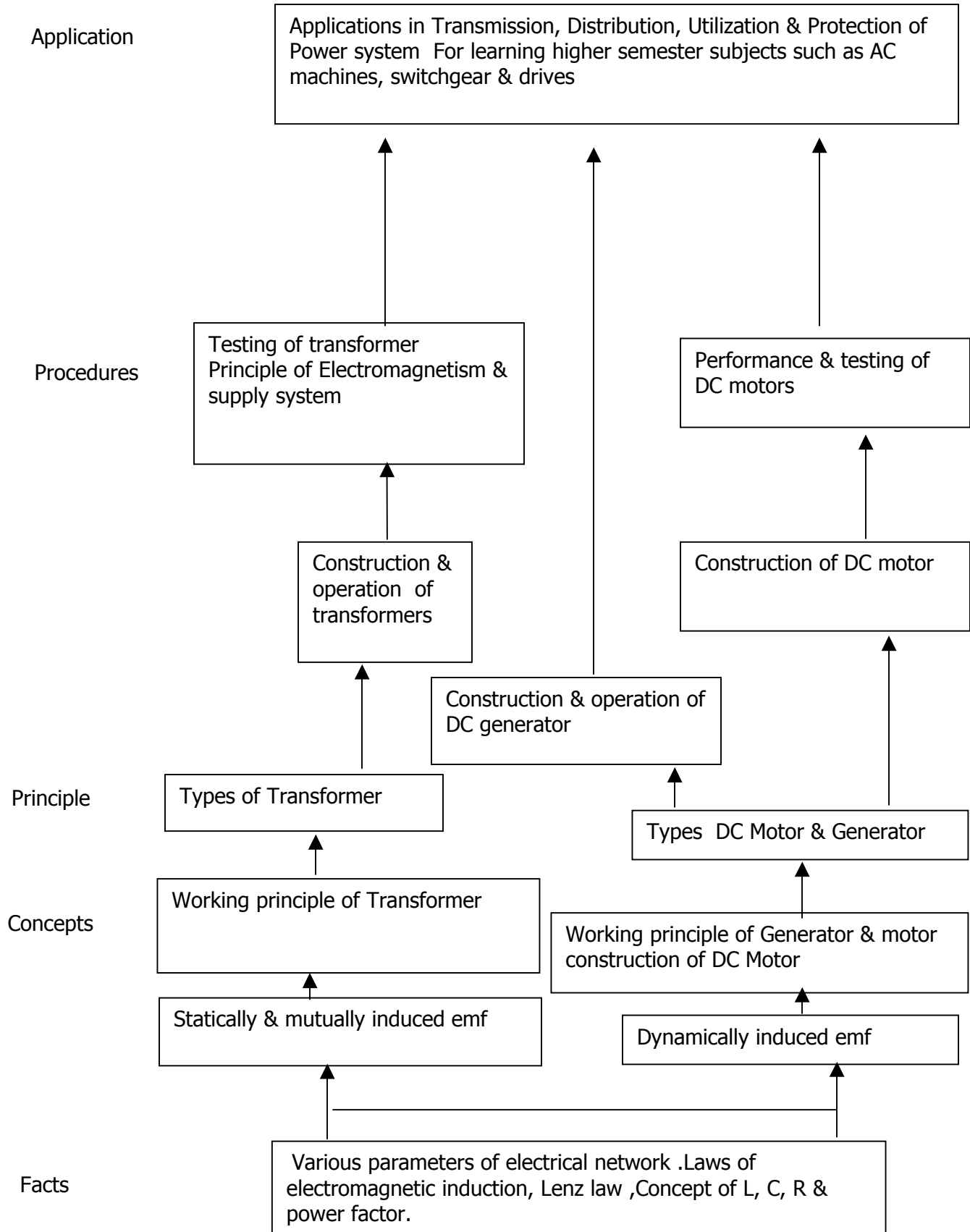
The knowledge & the skills obtained will be helpful in discharging duties such as supervisor, controller & R & D technician.

Objectives:

Student will be able to

1. Know the constructional details & working principles of dc machines & transformers.
2. Test motors & transformers.
3. Evaluate the performance of dc motors & transformers by conducting various tests.
4. Decide the suitability of motor & transformer for particular purpose.
5. Write the specifications of dc motor & transformers as per requirement.
6. Operate any machine properly.

Learning Structure:



| Chapter | Contents | Hours | Marks |
|--------------|--|-----------|-----------|
| | for Primary and secondary, Conductor cross section | | |
| 04 | Three phase Transformer 4.1 construction 4.2 connections 4.3 voltage & current ratio 4.4 vector groups 4.5 3 phase auto transformer 4.6 application of 3 phase auto transformer | 08 | 12 |
| 05 | Special purpose transformer 5.1 current transformer 5.2 potential transformer 5.3 isolation transformer 5.4 welding transformer | 04 | 08 |
| Total | | 48 | 80 |

Practical:

Skills to be developed:

Intellectual Skills:

1. Analytical Skills.
2. Identification skills.

Motor Skills:

1. Measurement Skills.
2. Connection Skills.

List of Practicals:

- 1) a) To identify the constructional parts of D. C. machine.
 b) To plot the O.C.C. of a given d. c. machine and to find critical resistance.
- 2) To find the performance of d. c. series & shunt motor by conducting load test
- 3) a) To control the speed of d. c. shunt motor above and below normal speed.

- b) To reverse the direction of rotation of d. c. motor.
- 4) a) To identify the constructional details of 1-phase and 3-phase transformer.
b) Visit to maintenance and repair workshop of a transformer and prepare a report.
- 5) To measure the performance of single phase transformer by direct loading and to find transformation ratio.
- 6) To measure the performance of single phase transformer by conducting O.C. and S.C. test.
- 7) To identify terminal polarity of corresponding phases of 3-phase transformer & to calculate transformation ratio.
- 8) To compare 1-phase auto transformer with two winding transformer by collecting literature from local dealer/manufacturer & compare the data on following points.
Weight of iron, weight of copper, turns ratio, efficiency & percentage regulation.
- 9) To observe the phase difference between primary & secondary voltage of 3-phase transformer for various vector groups.

Learning Resources:

Books:

| Sr.No | Title | Author | Publisher & Address |
|-------|----------------------------------|----------------|------------------------------|
| 1 | Electrical Technology | E. Hughes | Logmans, London |
| 2 | Electrical Technology | H. Cotton | C. B. S. Publisher New Delhi |
| 3. | Electrical Technology Vol. II | B. L. Theraja | S. Chand & CO Delhi |
| 4. | Electrical Machine Design | A. K. Sohawney | Dhanpatrai & Sons, New Delhi |