A. Prerequisite: Knowledge of basic electrical is must.

B. Aim and Objective: The objective of the course is to introduce the student to the study fundamentals of D. C. circuits.

C. Subject Code: 020010301 Subject: A. C. Circuit

D. Total: 52 Hrs. [Lecture: 3 Tutorial: 0 Practical: 2]

E. Detailed Syllabus:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Topic Name</th>
<th>Weightage (%)</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>AC Fundamentals</strong></td>
<td>15</td>
</tr>
<tr>
<td>1.1</td>
<td>Principle of generating an alternating voltage</td>
<td></td>
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<tr>
<td>1.2</td>
<td>Cycle, Time period, Frequency, Amplitude, Phase and Phase difference, Average value, R.M.S. value, Form factor, Peak Factor and Power Factor</td>
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<tr>
<td>1.3</td>
<td>Vector representation of alternating quantities, addition, subtraction, multiplication and division</td>
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<td>2.</td>
<td><strong>AC Series circuits</strong></td>
<td>15</td>
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<tr>
<td>2.1</td>
<td>Waveforms, phasor diagram and expression of voltage, current and power in pure: Resistance, Inductance, Capacitance</td>
<td></td>
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<tr>
<td>2.2</td>
<td>AC through RL, RC, LC, RLC series circuit</td>
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<tr>
<td>2.3</td>
<td>Resonant frequency and Resonance condition in RLC series circuit</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td><strong>AC Parallel Circuits</strong></td>
<td>20</td>
</tr>
<tr>
<td>3.1</td>
<td>Solution of AC RL, RC, LC and RLC parallel circuits using phasor method.</td>
<td></td>
</tr>
<tr>
<td>3.2</td>
<td>Solution of AC RL, RC, LC and RLC parallel circuits using admittance method.</td>
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<tr>
<td>3.3</td>
<td>Resonant frequency and resonance condition in parallel AC circuits</td>
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<td>3.4</td>
<td>Numerical based on AC parallel circuits and parallel resonance.</td>
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<tr>
<td>4</td>
<td><strong>Poly phase circuits</strong></td>
<td>20</td>
</tr>
</tbody>
</table>
4.1 Principle of generation of three phase alternating voltage.
4.2 Line and phase voltage, line and phase current
4.3 Single and three phase circuits
4.4 Three-phase star connection
4.5 Three phase delta connection

5 Star & Delta connected Circuits
5.1 Three-phase star connection
5.2 Three phase delta connection

6 Power in AC Circuits
6.1 Active, reactive and apparent power with examples.
6.2 Lagging, leading power and unity power factor

E. Modes of Transaction (i.e. Delivery)
1. Various methods of teaching could be employed depending on the objectives of the content taught.
2. Teaching activities can be carried out using conventional (chalk & board) method and/or with advance multimedia equipment’s.
3. Theory and practical may be explained with some basic simulation tools.
4. Separate session should be conducted to explain the concept of subject practically.

G. Teachers Activities/Practicum
The following activities should be carried out by the teachers.

1. Carry out Mid-semester examination & remedial examination (if necessary).
2. Continuous evaluation may be carried out to evaluate the performance of student by mean of arranging Quiz/viva/sessional examination.
3. Laboratory sessions are used to show the practical applications of the subject.
4. Minimum three assignments should be given to students which cover all important topic of the subject.

H. Student Activities/Practicum
The following activities may be carried out by the students.

1. Remain present in all theory and practical sessions conducted by faculties.
2. Complete assignments and other term work time to time given by faculty.
3. Prepare a book to keep a record of practical sessions conducted by faculties and complete the laboratory manual in time.
I. Text Books

1. Textbook of Electrical Technology Vol 1 (Multi colour) By B. L. Thereja, S.Chand&Co.

J. Reference Books

2. Basic Electrical Engineering  Rao, Uma. K. Pearson Education, New Delhi, 2011 or latest
3. Basic Electrical Engineering Murthy, R. S. Pearson Education, New Delhi, 2011 or latest