| Discipline: **EE** | Semester: **3rd** | Name of the Teaching Faculty: **MANMATHA BEHERA** |
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| Subject: **CIRCUIT AND NETWORK THEORY** | No. of Days/per week class allotted: **05** | Semester From Date: **01-08-2023** To Date: **09-12-2023**<br>No. of Weeks : **15** |
| **Week** | **Class Day** | **Theory Topics** |
| 1st | 01 | **Unit 1:MAGNETIC CIRCUITS**<br>Introduction |
| | 02 | Magnetizing force, Intensity, MMF, flux and their relations |
| | 03 | Permeability, reluctance and permeance |
| | 04 | Analogy between electric and Magnetic Circuits |
| | 05 | **Tutorial** |
| 2nd | 01 | B-H Curve |
| | 02 | Series & parallel magnetic circuit |
| | 03 | Hysteresis loop |
| | 04 | **Tutorial** |
| | 05 | **Unit 2:COUPLED CIRCUITS**<br>Self Inductance and Mutual Inductance |
| 3rd | 01 | Conductively coupled circuit and mutual impedance |
| | 02 | Dot convention,Coefficient of coupling |
| | 03 | Series and parallel connection of coupled inductors. |
| | 04 | Solve numerical problems |
| | 05 | **Tutorial** |
| 4th | 01 | **Unit 3:CIRCUIT ELEMENTS AND ANALYSIS**<br>Active, Passive, Unilateral & bilateral, Linear & Non linear elements |
| | 02 | Mesh Analysis, Mesh Equations by inspection |
| | 03 | Super mesh Analysis |
| | 04 | Nodal Analysis, Nodal Equations by inspection |
| | 05 | **Tutorial** |
| 5th | 01 | Super node Analysis. |
| | 02 | Source Transformation Technique; Solve numerical problems |
| | 03 | **Tutorial** |
| | 04 | **Unit 4:NETWORK THEOREMS**<br>Star to delta transformation |
| | 05 | Delta to star transformation |
| 6th | 01 | Super position Theorem. |
| | 02 | Thevenin’s Theorem |
| | 03 | **Tutorial** |
| | 04 | Norton’s Theorem |
| | 05 | Maximum power Transfer Theorem. |
| 7th | 01 | **Tutorial** |

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| | 02 | Solve numerical problems |
| | 03 | Solve numerical problems |
| | 04 | **Unit 5:AC CIRCUIT AND RESONANCE**<br>A.C. through R-L, R-C & R-L-C Circuit |
| | 05 | Solution of problems of A.C. through R-L, R-C & R-L-C series Circuit by complex algebra method. |
| 8th | 01 | Solution of problems of A.C. through R-L, R-C & R-L-C parallel & Composite Circuits |
| | 02 | Power factor & power triangle. |
| | 03 | Deduce expression for active, reactive, apparent power. |
| | 04 | Derive the resonant frequency of series resonance and parallel resonance circuit |
| | 05 | **Tutorial** |
| 9th | 01 | Solve numerical problems |
| | 02 | Define Bandwidth, Selectivity & Q-factor in series circuit. |
| | 03 | **Tutorial** |
| | 04 | **Unit 6:POLYPHASE CIRCUIT**<br>Concept of poly-phase system and phase sequence |
| | 05 | Relation between phase and line quantities in star & delta connection |
| 10th | 01 | Power equation in 3-phase balanced circuit. |
| | 02 | Solve numerical problems |
| | 03 | Measurement of 3-phase power by two wattmeter method. |
| | 04 | Solve numerical problems |
| | 05 | **Tutorial** |
| 11th | 01 | **Unit 7:TRANSIENTS**<br>Steady state response. |
| | 02 | Transient state response. |
| | 03 | Response to R-L circuit under DC condition. |
| | 04 | Response to R-C circuit under DC condition. |
| | 05 | **Tutorial** |
| 12th | 01 | Response to RLC circuit under DC condition, Solve numerical problems |
| | 02 | **Tutorial** |
| | 03 | **Unit 8:TWO-PORT NETWORK**<br>Open circuit impedance (z) parameters |
| | 04 | Short circuit admittance (y) parameters |
| | 05 | Transmission (ABCD) parameters |
| 13th | 01 | Hybrid (h) parameters. |
| | 02 | Inter relationships of different parameters |
| | 03 | Inter relationships of different parameters |
| | 04 | T and π representation. |
| | 05 | **Tutorial** |
| 14th | 01 | Solve numerical problems |

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| | 02 | **Tutorial** |
| | 03 | **Unit 9:FILTERS**<br>Define filter;2 Classification of pass Band, stop Band and cut-off frequency. |
| | 04 | Classification of filters |
| | 05 | Constant – K low pass filter |
| 15th | 01 | Constant – K high pass filter. |
| | 02 | Constant – K Band pass filter |
| | 03 | Constant – K Band elimination filter; Solve Numerical problems |
| | 04 | **Tutorial** |
| | 05 | Important Questions Discussion |