**MAHAMAYA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCE,**

**NUAPADA**

**DEPARTMENT OF ELECTRICAL ENGINEERING**

# SUBJECT: TH-2: CIRCUIIT & NETWORK THEORY CONCERNED FACULTY: ER. BARADA PRASAD SAHOO SEM: 3RD SEMESTER SESSION- 2022-23 SEMESTER FROM DT: 15-09-2022 TO DT: 22-12-2022 NO. OF WEEKS: 14 NO. OF DAYS/ PER WEEK CLASS ALLOTED: 4L + 1T PERIODS/WEEK

**LESSON PLAN**

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| WEEK | DATE | MODULE | THEORY / PRACTICAL TOPICS | CLASS DAY | REMARKS |
| 1ST |  | 03 | CIRCUIT ELEMENTS, LAWS, NETWORK ANALYSIS | 06 PERIODS |  |
| 15-09-2022 | 3.1 Introduction to Electrical circuits Charge,  Voltage, current, power and energy  OHM’s law, Resistance, Inductance & capacitance as parameters | 1 |  |
| 16-09-2022 | Types of circuit elements, Active, Passive,  Unilateral & bilateral, Linear & Nonlinear elements | 1 |  |
| 2ND | 19-09-2022 | 3.2 KVL and KCL, Voltage division & current division. | 1 |  |
| 20-09-2022 | 3.3 Mesh Analysis, Mesh Equations by inspection 3.3.1 Super mesh Analysis | 1 |  |
| 21-09-2022 | 3.4 Nodal Analysis, Nodal Equations by inspection 3.5 Super node Analysis | 1 |  |
| 22-09-2022 | 3.6 Source Transformation Technique  3.7 Solve numerical problems (with independent source only) | 1 |  |
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|  | 04 | NETWORK THEOREMS: | 08 Periods |  |
| 23-09-2022 | 4.1 Star – delta transformation | 1 |  |
| 3RD | 26-09-2022 | 4.2 Super position Theorem | 1 |  |
| 27-09-2022 | 4.3 Thevenin’s Theorem | 1 |  |
| 28-09-2022 | 4.4 Norton’s Theorem | 1 |  |
| 29-09-2022 | 4.5 Reciprocity Theorem | 1 |  |
| 30-09-2022 | 4.6 Compensation Theorem | 1 |  |
| 4TH | 10-10-2022 | 4.7 Maximum power Transfer theorem | 1 |  |
| 11-10-2022 | 4.8 Milliman’s Theorem | 1 |  |
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|  | 01 | MAGNETIC CIRCUITS | 07 Periods |  |
| 12-10-2022 | 1.1 Introduction | 1 |  |
| 13-10-2022 | 1.2 Magnetizing force, Intensity, MMF, flux and their relations | 1 |  |
| 14-10-2022 | 1.3 Permeability, reluctance and permeance | 1 |  |
| 5TH | 17-10-2022 | 1.4 Analogy between electric and Magnetic  Circuits | 1 |  |
| 18-10-2022 | 1.5 B-H Curve | 1 |  |
| 19-10-2022 | 1.6 Series & parallel magnetic circuit | 1 |  |
| 20-10-2022 | 1.7 Hysteresis loop | 1 |  |
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|  | 02 | COUPLED CIRCUITS: | 05 Periods |  |
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|  | 21-10-2022 |  | 2.1 Self Inductance, mutual inductance | 1 |  |

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| 6TH | 25-10-2022 |  | 2.2 Conductively coupled circuit and mutual impedance | 1 |  |
| 26-10-2022 | 2.3 Dot convention | 1 |  |
| 27-10-2022 | 2.4 Coefficient of coupling | 1 |  |
| 28-10-2022 | 2.5 Series and parallel connection of coupled inductors | 1 |  |
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| 7TH |  | 5 | AC CIRCUIT AND RESONANCE: | 08 Periods |  |
| 31-10-2022 | 5.1 Review of A.C. through R-L, R-C & R-L-C Circuit | 1 |  |
| 01-11-2022 | 5.2 Solution of problems of A.C. through R-L, R-C & R-L-C series Circuit by complex algebra method. | 1 |  |
| 02-11-2022 | 5.3 Soluti on of problems of A.C. through R-  L, R-C & R-L-C parallel &Composite Circuits | 1 |  |
| 03-11-2022 | 5.4 Power factor & power triangle. | 1 |  |
| 04-11-2022 | 5.5 Deduce expression for active, reactive, apparent power. | 1 |  |
| 8TH | 07-11-2022 | 5.6 Series resonance & band width in RLC  Circuit | 1 |  |
| 09-11-2022 | 5.7 Resonant frequency for a tank circuit | 1 |  |
| 10-11-2022 | 5.8 Q factor & selectivity in series circuit. | 1 |  |
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|  | 8 | TWO-PORT NETWORK: | 08 Periods |  |
| 11-11-2022 | 8.1 Open circuit impedance (z) parameters | 1 |  |
| 9TH | 14-11-2022 | 8.2 Short circuit admittance (y) parameters | 1 |  |
| 15-11-2022 | 8.3 Transmission (ABCD) parameters | 1 |  |
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|  | 16-11-2022 |  | 8.5 Hybrid (h) parameters. | 1 |  |
| 17&18-11-2022 | 8.6 Inter relationships of different parameters. | 2 |  |
| 10TH | 21-11-2022 | 8.7 T representation. | 1 |  |
| 22-11-2022 | 8.8 π representation. | 1 |  |
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|  | 6 | POLY PHASE CIRCUIT: | 06 Periods |  |
| 23-11-2022 | 6.1 concept of poly-phase system and phase sequence | 1 |  |
| 24-11-2022 | 6.2 relation between phase and line quantities in star & delta connection | 1 |  |
| 25-11-2022 | 6.3 power equation in three phase balanced circuit | 1 |  |
| 11TH | 28-11-2022 | 6.4 solved numerical problems | 1 |  |
| 29-11-2022 | 6.5 measurement of 3-phase power by two wattmeter method | 1 |  |
| 30-11-2022 | 6.6 solved numerical problems | 1 |  |
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|  | 7 | TRANSIENTS: | 06 Periods |  |
| 01-12-2022 | 7.1 Steady state response. | 1 |  |
| 02-12-2022 | 7.1 transient state response. | 1 |  |
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| 12TH | 07-12-2022 |  | 7.2 Response to R-L circuit under DC condition. | 1 |  |
| 09-12-2022 | 7.2 Response to R-C circuit under DC condition. | 1 |  |
| 10&11-12-2022 | 7.2 Response to RLC circuit under DC condition. | 2 |  |
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| 13TH |  | 9 | FILTERS: | 06 Periods |  |
| 14-12-2022 | 9.1 Classification of filters. | 1 |  |
| 9.2 Filter networks. |  |
| 9.3 Equations of filter networks. |  |
| 15-12-2022 | 9.4 Classification of pass Band, stop Band and cut-off frequency. | 1 |  |

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|  |  |  | 9.5 Characteristic impedance in the pass and stop bands |  |  |
| 16-12-2022 | 9.6 Constant – K low pass filter | 1 |  |
| 17-12-2022 | 9.7 Constant – K high pass filter | 1 |  |
| 18-12-2022 | 9.8 Constant – K Band pass filter | 1 |  |
| 14TH | 21-12-2022 | 9.9 Constant – K Band elimination filler | 1 |  |
| 22-12-2022 |  | REVISION CLASSES Q&A DISCUSSION | 1 |  |