**University of Management and Technology**

**School of Engineering**

**Department of Electrical Engineering**

**Course Outline**

Course code……EE 212………………… Course title……Electrical Network Analysis……………………

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| Program | BSEE |
| Credit Hours | 3 |
| Duration | One semester |
| Prerequisites | EE111 |
| Resource Person | Khan M. Nazir |
| Counseling Timing(Room# ) | 1:30 pm to 4pm , Monday & Wednesday11am to 1 pm, Tuesday & ThursdayProject Lab |
| Contact | 03454030919Khan.nazir@umt.edu.pk |

**Chairman/Director signature………………………………….**

**Dean’s signature…………………………… Date………………………………………….**

**Learning Objective:**

Upon Completion of the course, the students will be able to:-

a. Converts Sinusoids into Phasors, and Solve Circuits by applying Phasors .

b. Carry out Sinusoidal Steady State Analysis

c. Carry out AC Power Analysis

d. Analyze balanced three phase systems

e. Apply Concept of Magnetically Coupled Circuits.

f. Solve circuits by applying Laplace and Fourier transforms

g. Analyze Two-Port Networks

**Learning Methodology:**

Lecture, interactive, participative

**Grade Evaluation Criteria**

Following is the criteria for the distribution of marks to evaluate final grade in a semester.

**Marks Evaluation Marks in percentage**

Quizzes 10

Assignments 6

Mid Term 25

Attendance & Class Participation 5

Term Project 4

Presentations

Final exam 50

Total 100

**Recommended Text Books:**

Recommended Books:

**Text book:** Fundamentals of Electric Circuits, 5th Ed., By Alexander and Sadiku

**Reference Books:**

1) The Analysis and Design of Linear Circuits, by Ronald Thomas, and Albert Rosa

2) Electric Circuits, Eighth Edition, by Nilsson & Riedel

3) Basic Engineering Circuit Analysis, 8t h Ed., By J. David Irwin

**Calendar of Course contents to be covered during semester**

**Course code………EE212 Course title…Electrical Network Analysis……………**

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| --- | --- | --- |
|  **Week** |  **Course Contents**  | **Reference Chapter(s)** |
|  1 | 9.1 Introduction9.2 Sinusoids9.3 Phasors9.4 Phasor Relationships for Circuit Elements | Ch-9 |
|  2 | 9.5 Impedance and Admittance 9.6 Kirchhoff’s Laws in the Frequency Domain9.7 Impedance Combinations 390 | Ch-9 |
|  3 | 10.1 Introduction to Sinusoidal Steady State Analysis 10.2 Nodal Analysis 10.3 Mesh Analysis10.4 Superposition Theorem 10.5 Source Transformation   | Ch-10 |
|  4 | 10.6 Thevenin and Norton Equivalent Circuits 10.7 Op Amp AC Circuits11.1 Introduction to AC Power Analysis11.2 Instantaneous and Average Power  | Ch-10Ch-11 |
|  5 | 11.3 Maximum Average Power Transfer 11.4 Effective or RMS Value 11.5 Apparent Power and Power Factor11.8 Power Factor Correction  | Ch-11 |
|  6 | 12.1 Introduction to Three-Phase Circuits12.2 Balanced Three-Phase Voltages 12.3 Balanced Wye-Wye Connection 12.4 Balanced Wye-Delta Connection  | Ch-12 |
|  7 | 12.5 Balanced Delta-Delta Connection 12.6 Balanced Delta-Wye Connection12.7 Power in a Balanced System  | Ch-12  |
|  8 | **Mid Term Examination** |  |
|  9 | 13.1 Introduction to Magnetically Coupled Circuits13.2 Mutual Inductance 13.3 Energy in a Coupled Circuit 13.4 Linear Transformers 13.5 Ideal Transformers 13.6 Ideal Autotransformers  | Ch-13  |

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|  10 | 14.1 Introduction to Frequency Response14.2 Transfer Function 14.3 †The Decibel Scale 14.4 Bode Plots 14.5 Series Resonance 14.6 Parallel Resonance  | Ch-14 |
|  11 | 14.7 Passive Filters 14.7.1 Lowpass Filter14.7.2 Highpass Filter14.7.3 Bandpass Filter14.7.4 Bandstop Filter | Ch-14 |
|  12 | 15.1 Introduction to Laplace Transform15.2 Definition of the Laplace Transform 15.3 Properties of the Laplace Transform 15.4 The Inverse Laplace Transform 15.4.1 Simple Poles15.4.2 Repeated Poles15.4.3 Complex Poles | Ch-15 |
|  13 | 16.1 Introduction to the Application of Laplace Transform16.2 Circuit Element Models 16.3 Circuit Analysis 16.4 Transfer Functions  | Ch-16 |
|  14 | 17.1 Introduction to Fourier Series17.2 Trigonometric Fourier Series 17.3 Symmetry Considerations 17.3.1 Even Symmetry17.3.2 Odd Symmetry17.3.3 Half-Wave Symmetry17.4 Circuit Applications  | Ch-17 |
|  15 | 19.1 Introduction to Two-Port Networks19.2 Impedance Parameters 19.3 Admittance Parameters 19.4 Hybrid Parameters 19.5 Transmission Parameters 19.7 Interconnection of Networks | Ch-19 |
|  16 | **Final Examination** |  |